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Ways of thinking about the incinerator: A typology of citizens' mindsets

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Abstract

This paper considers the social representation of an incinerator plant operating for more than 30 years in a medium-sized city in Italy. A survey was carried out with a representative sample of an Italian town, a community that was not generally hostile to it. On the basis of self-efficacy and trust in institutions, and by applying cluster analyses, we obtain evidence for four distinct groups labelled as Fatalists, Collaboratives, Activists ,and

Delegants. The four groups express systematic variations in social representation. We discuss the theoretical and practical impacts of these results.

Keywords: attitude, social representations, waste disposal, trust, self-efficacy

1. Introduction

This study explores whether citizens in a community peacefully hosting a waste incinerator that has been operating for a long time, share a homogenous view of it, or whether they express distinct and complex configurations of beliefs and evaluations.

Research on environmental attitude as well as on public engagement and dialogue on science and technology has typically focused attention on public opinion, especially when controversial technologies and their societal consequences are at stake (Einsiedel, 2008). The field of waste disposal solutions is one of such example, since local governments often have to deal with the population's opposition toward facilities because the facilities are perceived as costly in terms of environmental pollution and health risks. Many studies have examined locally unwanted land use (Freudenberg & Pastor 1992) and, as one of the prototypical examples, local opposition to incinerator sites (Davies, 2008; Hsu, 2006; Kikuchi, & Gerard, 2009; Ladd, 1991; Matias, 2004).

However, successful experiences of plant siting exist (Achillas, et al., 2011; Furuseth & O'Callaghan, 1991; Khammaneechan, et al., 2011), and many incinerators operate in communities where no conflict is at stake, since citizens agree with the local administrators' waste management solution.

In this regard, some scholars underline the importance for both the environmental social scientists and local administrators to deepen the understanding of the psycho-social correlates of public acceptability. Such an understanding would help generate positive responses to potentially controversial technologies and prevent the negative consequences of public disquiet (Gupta, Fischer, & Frewer, 2012; Petts, 1994; Venables, et al., 2012).

A number of studies cast light on citizens' attitudes toward waste facilities or risk perceptions linked to various waste management solutions, such as incinerators (Khammaneechan, et al., 2011; Lima, 1996). However, attitude and risk perception are just

two aspects of a more global and complex socially shared representation. A recent review of the psychosocial determinants of public acceptance of technologies shows that perceived risk, perceived benefit, trust, knowledge, individual differences, and attitude are the most influential predictors of public acceptance of technologies (Gupta, Fischer, & Frewer, 2011). Castro (2006) suggests that the social representations approach (Moscovici, 1984) is well-suited to individuate citizens' mindset toward environmental problems. In the same vein, Brondi and colleagues (Brondi, et al., 2012) show that such an approach is particularly useful to unfold also the long-term effects of environmental public policies on communities.

Indeed, social representations are complex configurations of attitudes, beliefs, knowledge, and emotions built around a socially relevant object and shared by social groups (Moscovici, 1984). Thus, social representation is a more inclusive concept than attitude or belief. Social representations are forms of social knowledge: systems of values, beliefs, opinions, semantic repertoires, and theories of common sense resulting from a process of reconstruction of reality into a symbolic system elaborated in relation to socially relevant objects, through communicative exchanges between people in groups and communities (Doise, 1989). Social representations therefore are a sort of map of the semantic field relative to an object – in our case, the incinerator. Within this common field of reference, individuals and social groups adopt different positions, but they are able to meet on common ground. For example, everybody has an idea of what an incinerator is, regardless of personal risk perception. Social representations allow people to understand each other when talking about the object and to orient their behaviour toward it. Hence, for example, social representations of the facility designed to solve the waste problem determine what citizens are willing to do in order to sustain or oppose its implementation.

But does the weakness of a manifested opposition[1] mean that public opinion holds an undifferentiated and positive representation of the plant? Following the social representations approach the answer would be negative because it suggests that different social

representations of the same object could be developed by distinct social groups according to the relevance the object has for them: the symbolic distance between the object and the social groups gives rise to different ways of thinking about it. Thus, it is important to individuate the organising principles that characterise different social representations and that define the social groups holding homogeneous orientations toward the objects. The concept of organizing principles of interindividual and intergroup differences was introduced by Doise (1989) in order to underline the importance of variability in social representations. Organizing principles correspond to systematic variations in the weight individuals or groups give to the dimensions that substantiate the representation. Following the model of Doise, et al. (1993), systematic variations may be anchored at three levels: psychological, psycho-sociological, and/or sociological. Psychological anchoring corresponds to variations as a function of attitudes or value choices at an individual level. Psycho-sociological anchoring refers to the influence due to the way people perceive the social relations among social groups and more generally the social structure (for example, privileged or unprivileged social groups). Finally, the sociological level has to do with variations anchored to socio-demographical belonging of the individuals and their shared experiences, such as political affiliation.

In the domain of public facilities, such as the incinerator at the core of the present research, some authors (Flynn, et al., 1992; Freudenburg & Rursch, 1994; Petts, 1994) claim that an important factor in citizens' negative attitudes is the lack of trust in waste managers, decision makers, decision processes, and control mechanisms for waste facility siting and operations. More generally, much empirical evidence is now available supporting the idea that trust in institutions is a determinant correlate of perception and acceptability of risks (Besley, 2010; Frewer, et al., 1996; Jenkins-Smith, Silva, Nowlin, & deLozier, 2011; Kasperson, Golding, & Tuler, 1992; Khammaneechan, et al., 2011; Kunreuther, Slovic, & MacGregor, 1996; Poortinga & Pidgeon, 2005). Moreover, trust helps people simplify decisions involving a large amount of very complex information and reduce uncertainty to an acceptable level:

trust could be used as a heuristic cue in order to formulate judgement. If adopted as an isolated criterion, high level trust could elicit a delegant orientation: ”I trust the expert, so I support his/her decision a-critically.” Thus, we can expect that an organising principle of social representations of the incinerator is trust in the institutions managing the waste problem.

Furthermore, when socio-political behaviours are at stake, another relevant motivating dimension could be an organising principle of social representations: political self-efficacy. Originally coined by Bandura (1982), self-efficacy is the feeling that individual action can actually achieve a desired goal or exert an impact upon the context. Citizens characterised by high levels of political self-efficacy should tend to see a collective problem as something calling for some personal, cognitive or behavioural effort (Anderson, 2010; Caprara, et al., 2009; Cavazza, Corbetta, & Roccato, 2006; Craig, Niemi, & Silver, 1990). Thus, it seems reasonable to expect that if high self-efficacy citizens trust public institutions, they would also tend to collaborate with them, whereas they would be in contrast with public institutions in case of low trust. Moreover, a low perception of control by individuals with respect to their physical and social environment is typically associated with social disengagement (Larose & Pontom, 2000) that may take the form of delegation in cases of trust in public institutions, and political alienation or fatalism in cases of low trust. In sum, trust toward local institutions and self-efficacy might be the psychological anchor in the social representations about the incinerator.

Finally, in the case we are analysing, the symbolic distance between the object and the social groups is presumably rooted in the physical distance between people’s houses and the plant: close residents may feel part of an unprivileged group of citizens paying the costs of a plant which benefits a larger population. Thus, physical distance from the plant is likely to play the role of psycho-sociological anchoring. Although previous research has shown attitudes toward waste facilities relate to residential proximity, this relation appears to reverse

in the plant life course: close residents tended to express high risk perception and negative attitudes toward the siting of new plants (Lima, 2004; Lima & Marques, 2005), but in the case of already established plants, close residents tended to be less hostile than residents who were further away (Burningham & Thrush, 2004; Maderthaner, et al., 1978; Wakefield & Elliott, 2000).

Given that we are analysing the case of a very old plant, we expect to find that the object and its potential consequences are already well experienced and metabolised over time by town residents both near and far. Thus we do not expect residential proximity to be an organising principle.

2. Objective and hypothesis

Our study is focused on the role that self-efficacy and trust toward local institutions play in influencing the way citizens represent the incinerator as a good solid waste management solution or as a serious problem likely to induce people to organise or join a protest committee.

We reasoned that self-efficacy and trust toward the institutions that manage the waste problem are psychological tools orienting citizens' representation of the incinerator, their involvement with the issue, their search for information, and finally, their propensity to eventually engage in action, such as collective protest.

We adopt a person-oriented, or configural, approach that considers differences across conceptually distinct groups of people. Group membership is defined in terms of their similarity to other group members on a set of predictors of interest (Sinclair, et al., 2005).

Table 1 shows the subdivision we test in terms of a set of four hypothetical representational profiles deriving from crossing the two above cited crucial dimensions: self-efficacy and trust toward local institutions.[2] Studies in the political domain find these two

dimensions are independent of each other (Cavazza, Corbetta, & Roccato, 2006; Craig, Niemi, & Silver, 1990). Therefore, we should find citizens characterised by relatively low levels of both the motivational tools, self-efficacy and trust, needed to hold a clear position. Since they feel that the local political domain is uncontrollable and untrustable, they should believe that nothing can about community problems. We will call them Fatalists. There will be people with relatively high levels of both motivational tools, those who perceive themselves as having some control over the managing local problems and who trust the local institutions. We will consider them, potentially, Collaboratives. A third case should be that of people who do not trust local institutions and think that they can do something to influence the situation. Previous studies (Paige 1971; Gurin & Brim, 1984) show that high self-efficacy is associated with low trust toward political authorities in political activists. This is why we will call them, potentially, Activists. Finally, the fourth group represents people who do not trust in their own potential to influence - low self-efficacy - but who think local institutions know how to manage it. In other words, they are inclined to delegate finding a solution: Delegants.

We hypothesize that the subdivision derived from crossing these two dimensions will be diagnostic of four complex and distinct mindsets (social representations made of knowledge, concern, attitude, cognitive and affective ambivalence, risk perception) toward the incinerator.

We explore also the potential sociological anchors of these representations, analysing whether the four profiles are rooted in particular population segments – sex, age, education level, political orientation – along with the potential psycho-sociological anchoring influenced by residential proximity. Many studies have found these variables to be related to the acceptability of waste management facilities (Benford, Moore, & Williams, 1993; Mitchell, 1984; Rahardyan, et al., 2004). Moreover, the socio-political context in which technologies are embedded also shapes public debate and their acceptance (Gupta, et al., 2011). We

therefore expect to find low-educated people over-represented among the Fatalists and the Delegants because of low self-efficacy, and highly educated people over-represented among Activists for the opposite reason (Anderson, 2010; Craig, Niemi, & Silver, 1990); those with left-wing political orientation will also be numerous among the Collaboratives or Delegants because of their trust in the local left-wing government, one of the institutions managing the waste disposal. Based on the available literature, no specific predictions are made on the eventual effects of age and sex.

3. Method

3.1. Data, participants, and procedure

The present research is based on a questionnaire administered to a representative sample of 841 residents in the area of Modena, a medium-sized northern Italian town. An incinerator – active for the past 30 years – is located 4 km away from the town. A population of about 60,000 is exposed to its pollutants. In the period in which the study was carried out, the town was governed by a centre-left administration – this had been the case since 1946.

Citizens were selected randomly from the Health Registry (n = 1,260) in a sample stratified by age (M = 44.17, SD = 14.23, range 18–69), gender (48.2% men) and distance of residence from the incinerator. Distance from incinerator was subdivided into three levels: less than 2 km (30.8%), 2–4 km (35.7%) and over 4 km (33.5%). The people selected received an invitation to participate by mail. After that, the questionnaire was administered via computer-assisted interview system (CATI) by trained interviewers. Participation was voluntary, and the overall response rate was 66.7%. People refusing to participate were substituted by individuals with the same socio-demographical characteristics. Interviews were carried out between November 2009 and March 2010.

3.2 Measures

Predictors used to build the typology are self-efficacy and trust toward the specific local institutions charged with managing and monitoring the city's elected local government and local health public system waste disposal.

3.2.1 Self-efficacy.

In the present study we included the four items usually employed to measure political self-efficacy (Balch, 1974; Converse, 1972), substituting governmental authorities and institutions with the local authority Respondents used a 1- to 4-point scale (1 = absolutely false and 4 = absolutely true). An overall index was then calculated (Alpha = .70).

3.2.2 Trust toward the local institutions.

We assessed trust toward the local institutions by asking how much the respondent trusts the local government and the local health public service on a 4-point scale ranging from 1 = not at all to 4 = very much. The two items are positively correlated ($r = .56$ $p < .001$) and combined into a trust index.

With the typology in place, we test whether the four clusters are actually diagnostic of a distinct social representation of the incinerator. Social representations are operationalized as the set of factors that in previous studies have been found to influence public acceptance of technologies: knowledge, involvement, attitude toward the incinerator, ambivalence, and risk perception operationalized as follows.

3.2.3 Knowledge.

The participants answered five questions directed at assessing their knowledge about the incinerator, such as "Do you know what 'waste-to-energy-plant' means?". Each question has three possible answers, one correct and two incorrect. Individual scores are based on the number of correct answers, with a range from 0 (no correct answer) to 5 (all correct answers).

3.2.4 Involvement.

Three items were included in the questionnaire in order to assess the personal involvement level; one asks how much the respondents are interested in the issue of the local incinerator; the second asks how much they felt worried about it, and the third asks for the frequency they speak about this issue. All answers are given on a 4-point scale and combined into an overall index (Alpha = .62). Higher scores indicate higher involvement.

3.2.5 Attitude toward the incinerator.

The cognitive and affective components of the respondents' attitude towards the incinerator are measured by means of 12 ad hoc items concerning emotional reactions. Six items are positive and three are negative; for instance, worry and tranquillity. Six items measure beliefs: three in favour of and three against the incinerator. For example, the scale includes such statements as "the Modena incinerator is a good solution for the waste disposal," and "The Modena incinerator is detrimental for citizens.. After reversing the positive items, an overall index was then calculated as the item means (Alpha = .80). Higher scores correspond with a more negative attitude.

3.2.6 Cognitive and affective ambivalence.

The same 12 attitudinal items were used to calculate an index of potential ambivalence toward the incinerator. This type of ambivalence is not directly derived from the subjective perception of conflict. It is inferred through computations that consider the

presence and the intensity of both positivity and negativity toward the same attitude object. We combined the answers in two global ambivalence scores through the formula suggested by Thompson, Zanna, and Griffin (1995). This formula produces a score that is a function of the simultaneous intensity of the positive and negative ratings. Accordingly, we calculate separately potential cognitive and emotional ambivalences toward the incinerator by averaging the positive and negative attitude scores – (both expressed in negative values – and subtracting the absolute difference between the two components from the average of the two components, using the formula (P+N)/2-|P-N|, where P is the positive attitude score and N the negative attitude score. A higher value indicates a greater level of ambivalence (observed range -1.50 - 12). Values were then normalized in order to range from 0 to 1.

3.2.7 Risk perception.

Participants evaluated the incinerator risk answering 10 items on a 1- to 4-point scale; 1 = very serious and 4 = not at all serious. We select the items from the risk perception scale for measuring the biotechnological risk of Savadori, et al. (2004), translated and formulated to fit the local context. For example, "In your opinion, how serious are the potential risks associated to the incinerator for Modena citizens?" "In your opinion, how serious are the potential risks associated with the incinerator for future generations??" Scores are reversed so that higher scores correspond with higher risk perception. In order to detect a simple structure from the scale, a principal component factor analysis with Varimax rotation was run. A three-factor solution emerges. The first factor has an eigenvalue of 3.38, and explains 33.78% of the variance. It includes five items, such as "how serious do you think the risk of the Modena incinerator would be for future generations?", with factor loadings ranging from .66 to .84; the factors measure the perceived potential harmfulness of the incinerator Together they reach an acceptable level of reliability (Alpha = .85); thus they were collapsed into one overall

factor score of risk perception. Since the Alpha values show the second and third factors as insufficiently reliable, we exclude them from subsequent analyses.

Finally, we also asked for personal political orientation. The sample distribution of this variable is the following: left-wing 19.4%, centre-left 16.2%, centre 5.2%, centre-right 8%, and right-wing 9.2%. The majority of the participants (42.1%) decided not to declare their personal political orientation.

4. Results

We employ a k-means cluster analysis in order to group citizens according to their level of self-efficacy and trust toward the local institutions. Cluster analysis classifies individuals on the basis of profile similarity. Thus, based on this analysis each participant is assigned to a single homogeneous group.

We proceed on a theoretical rather than on an empirical basis to determine the number of clusters: since self-efficacy and trust toward local institution do not correlate (r = -.07 *ns*), an a priori estimation of four profiles results from crossing the two dimensions. The distribution of the citizens among the four segments is satisfactory (Table 2). Importantly, the four segments show significant means differences on the segmentation variables, self-efficacy, and trust toward local institutions.

4.1 Social representations' contents

Having established conceptually meaningful types of relationship between citizens and institutions with respect to the incinerator, we examine whether and how the four groups differ in their way to deal with the incinerator issue. We examine the differences in the social representation contents among the four clusters through a series of analyses of variance

(ANOVAs) with clusters set as between-subjects factors. Post-hoc pairwise comparisons are performed using the LSD method. The results are illustrated in Table 3. Significant differences were found for all measures.

The Activists manifest the most coherent and negatively connoted representation of the incinerator: they perceive it as a potential risk for the population. They also express univalent negative attitudes toward it and feel highly involved with this issue.

The Collaboratives manifest a representation of the plant focused primarily on the information they have, accompanied by weak negative attitude, though ambivalent, especially in its affective component.

The social representation expressed by the Fatalists includes a rather negative global attitude toward the incinerator, together with a relatively low perception of the risk it may entail. Indeed, Fatalist citizens also express high levels of both cognitive and affective ambivalence, confirming that the incinerator induces in them positive and negative beliefs and emotions at the same time. However, they probably are able to tolerate these contradictions because of their low involvement with this issue.

Finally, the Delegants report a representation weakly characterized by the content dimensions we analysed, except for the lowest risk perception. The incinerator seems to be a low relevant social object for these citizens.

4.2 Psycho-sociological and sociological anchoring

In order to test if systematic variations are rooted in socio-structural memberships, we sketch a socio-demographic profile of clusters. The results are illustrated in Table 4.

Women are under-represented among the Fatalists, but over-represented among the Delegants. People with higher education are over-represented among the Delegants, whereas

those with a high school diploma are over-represented among the Activists, who are also characterised by a higher mean age with respect to the other three groups.

We did not find a relationship between the distance between citizens' houses and the incinerator and the four types. It is political orientation that characterises the four groups: even though left-winger respondents are the majority in each group, as one could expect with a left-wing local government, they are over-represented among the Delegants, whereas the Activists tend not to answer this question; left-wing political orientation is under-represented among the Collaboratives who, despite this, maintain a high mean level of trust toward the local institutions, including both the local government and the professional local health services.

5. Discussion

This study considers variations in the social representations of an incinerator working in a medium-sized city in Italy, where such a plant has been active for more than 30 years in a peacefully framed relationship between citizens and the local administrators managing waste disposal. Notwithstanding general public acceptance of this waste disposal solution, we expected to find distinct representations of the incinerator plant expressed by sub-groups of citizens. Furthermore, our aim was to individuate the organising principles of the representations expressed by different social groups. On the basis of previous findings, we hypothesised that variations in the social representation are mainly anchored to psychological principles such as trust in the local institution and the sense of self-efficacy.

Results show that data fit the typology of the four clusters we hypothesized, and this typology is actually diagnostic of four different representational profiles. The crossing of self-efficacy and trust toward local institutions – dimensions that are independent of each other – give rise to four different and meaningful ways of representing and evaluating the incinerator

as a solution for waste problems. Citizens are not characterised simply by varied levels of risk perception associated with the incinerator, but also by knowledge about the plant, involvement, ambivalence and, obviously, attitude toward it.

Globally, we can remark that, in this context, a really problematic representation is expressed only in a minority of citizens. Those people we call Activists, that is citizens expressing a negative attitude, high involvement, and relatively strong fear of the risks, are the smallest group. They perceive a concrete possibility of contributing to finding a better solution (high self-efficacy), and express scepticism about the institutions' actions. Thus it would not be surprising if they joined the protesting committee had the local government not recently abandoned the plant extension project. However, local institutions could rely on a large group of skilled citizens ready to trust them; those we called Collaboratives. The findings concerning Collaboratives are particularly interesting because almost half of the sample includes citizens expressing a highly aware and articulated representation of the issue: they are knowledgeable, involved, and also concerned about the risks. Their trust in institutions and their worry about the risks are reflected in their attitudinal ambivalence. These are citizens who, despite their trust in, are not prone to blind delegation, but thanks to this same trust, they are not prone to join opposing activists. They would prefer to work within the system to ensure safety. Even though the cross-sectional nature of our survey prevents interpreting the data in dynamic terms, the important rate of Collaboratives found in this community is congruent with the research on public engagement and dialogue on science and technology showing that the quest for public participation in environmental policy has grown greatly in recent years (Yearley, 2008). Undoubtedly, this is a valuable resource for institutions willing to negotiate community decisions, rather than simply persuade the public of positive decisions previously taken.

The mindsets we have individuated are weakly anchored to sociological or psycho-sociological factors. First, the representations we found are not affected by residential

proximity.[3] Living close to the plant does not elicit feelings of membership in an underprivileged social group. Second, only the political identification seems to have a (weak) relationship with participants' orientation toward the incinerator: many left-wing citizens trust local institutions and keep their involvements low, falling into the Delegants cell; but for the other three groups the relationship is less obvious. The Activists prefer not to reveal their political identification, and we could speculate that this may be due to the fact that a right-wing orientation is hard to express in such a normative left-wing environment. Unexpectedly, relatively few left-wingers were found among the Collaboratives, despite their high level of trust. It is worth noting that they trust more the professional public health service ($M = 3.15$) than the local government ($M = 2.92$, $t\ (388) = 7.58$, $p < .001$). Finally Fatalists do not show any political characterization. However, the political characterization of our typology has to be taken with caution because more than 40% of the participants would not reveal their political orientation. This is quite usual in Italy when surveys are carried out in periods far from elections. Therefore, further empirical evidence is needed in order to support political anchoring as the most important influence on perceptions of the incinerator.

A second limitation of our research should be acknowledged: the absence of behavioural measures. This is due to the fact that the data were collected as part of a broader research project designed to guide institutional communication strategies in this specific community, and therefore we were limited by time/space constraints for questionnaire items.

Finally, since the catchment area served by this plant is larger than the municipality of Modena, it would be interesting to consider the point of view of people receiving its benefit without being exposed to the negative aspects. Indeed, this poses issues of fairness and equity that should be addressed in future research.

6. Conclusion

Despite these limitations, we believe that the present research using the social representation framework contributes to the literature on environmental attitudes in proposing an articulated descriptive model of mindsets toward a waste management facility, based on citizens' empowering and motivational tools. It remains to be seen whether our descriptive model is diagnostic also of intentions and behaviours, such as participation in initiatives of active citizenry (Foster-Fishman, Cantillon, Pierce, & Van Egeren, 2007).

The finding also has important implications concerning the management of a constructive relationship between public administrators and citizens. We showed that the dichotomy of pros/cons to political decisions is largely inadequate when citizens' awareness about community problems and the quest for participation is widespread. Local administrators, for their part, elaborate representations of the social problems from their point of view. However, in order to establish a full partnership able to substantiate institutional trust and credibility, they must be able to consider and deal with the different mindsets expressed by groups of citizens, not only when facing problems and making decisions, but also over the course of time. Beyond the formal inclusion in policy formation, the perception of the decision-making process in terms of procedural justice is a strong predictor of political trust (Petrzelka, Marquart-Pyatt, & Malin, 2013). Thus, public communication that encourages trust, public awareness, and participation through processes that include public engagement and dialogue is a positive investment (Einsiedel, 2008). Indeed, building trust in institutions is one of the goals public participation may contribute to the improvement of environmental policy, to diminish conflict and to implement better problem-solving processes (Beierle & Cayford, 2002). On the other hand, the weaknesses of sociological and psycho-sociological anchoring reveals that the social boundaries of the four categories are nuanced and fuzzy, making it a rather hard task to tailor communication that fills the gap between citizen views and the policy world.

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Endnotes:

[1] A committee for opposing the maintenance and the development of the plant exists, "Modena Salute Ambiente" (Modena Health & Environment, http://www.modenasaluteambiente.org/), but we infer that citizens are not very implicated in its activity. On 19th February 2011 it launched a petition against the development of the plant. The goal of its members was to reach 5000 signatures, but only 385 citizens actually signed it (http://firmiamo.it/contro-potenziamento-inceneritore-di-modena).

[2] The typology we propose has some similarities with the Cultural Theory (Douglas & Wildavsky 1982). Obviously we were inspired by that framework and, as in the grid-group analysis, we cross two dimensions as to obtain four groups to which we give labels similar to those of Cultural Theory (for example, Fatalists). However, the biggest difference concerns the dimensions crossed: grid-group analysis refers to two ways of conceiving society and in-groups whereas in our model the two dimensions refer to individual tools regulating the relation with the societal issue we are studying.

[3] In order to check if actually this is the case, we ran a one-way ANOVA with distance as independent variable and each psycho-social orientation (knowledge, concern, attitude, ambivalence, risk perception) as dependent variables. Results indicate that the distance do not influence any of these dimensions.

Table 1.

Hypothetical typology deriving from the crossing of self-efficacy and trust toward the local institutions.

	Self-efficacy	
Trust	Low	High
Low	Fatalists	(Potentially) Activists
High	Delegants	(Potentially) Collaboratives

Table 2.

K-means cluster analysis results.

	Cluster 1 Fatalists	*Cluster 2 Collaboratives*	*Cluster 3 Activists*	*Cluster 4 Delegants*	*F(3,821)*
Self-efficacy**	2.31_a (.41)	3.27_b (.37)	3.13_c (.40)	2.17_d (.43)	457.46
Trust toward local institutions**	2.29_a (.31)	3.03_b (.41)	1.83_c (.35)	3.31_d (.40)	375.89
Number of citizens	117	398	69	241	
Percentage	14.2 %	48.2 %	8.4 %	29.2 %	

Source: questionnaire administered to a representative sample of 841 residents in the area of Modena, Italy.
Notes: Significance at: *p < .05 and **p < .001. Sixteen participants were not classified due to missing answers. Means with different subscripts in the same line differ from each other at post-hoc test by at least p < .05.

Table 3.

Social representation contents (mean and standard deviation in parentheses) as a function of the clusters.

	Fatalists	*Collaboratives*	*Activists*	*Delegants*	*F(3,525)*
Knowledge**	2.12_a	$\mathbf{3.24_b}$	2.81_c	3.12_d	19.27
(range 0–5)	(1.51)	(1.44)	(1.55)	(1.36)	
Involvement*	2.34_a	$\mathbf{2.51_b}$	$\mathbf{2.62_b}$	2.41_a	3.57
(range 1–4)	(.73)	(.66)	(.93)	(.60)	
Negative attitude**	2.63_a	2.42_b	$\mathbf{2.90_c}$	2.33_b	18.46
(range 1–4)	(.52)	(.63)	(.62)	(.63)	
Cognitive	$\mathbf{.54_a}$	$.49_b$	$.45_b$	$.48_b$	2.70
ambivalence*	(.17)	(.19)	(.20)	(.19)	
(range 0–1)					
Affective	$\mathbf{.49_a}$	$\mathbf{.48_a}$	$.39_b$	$.40_b$	14.40
ambivalence**	(.15)	(.16)	(.22)	(.16)	
(range 0–1)					
Risk perception**	2.63_a	2.91_b	$\mathbf{3.07_c}$	2.66_a	12.28
(range 1–4)	(.72)	(.69)	(.69)	(.71)	

Source: questionnaire administered to a representative sample of 841 residents in the area of Modena, Italy.
Notes: Significance at: *p < .05 and **p < .001. Highest values in bold. Means with different subscripts in the same line differ from each other at post-hoc test by at least $p < .05$.

Table 4.

Socio-demographic profiles of clusters.

	Fatalists	Collaboratives	Activists	Delegants
Gender (female percentage)** $\chi^2(3) = 18.41$	38.26	50.25	44.12	61.11
Education* $\chi^2(6) = 14.87$				
Basic level (%)	34.48	31.98	26.48	26.66
High school diploma (%)	50.00	44.08	57.35	42.92
University degree (%)	15.52	23.94	16.17	30.42
Mean age* $F(3) = 2.71$	42.43_a (15.39)	43.48_a (13.62)	46.74_b (12.93)	45.78_b (15.00)
Distance from the incinerator $\chi^2(6) = 6.26$ ns				
1–2 km (%)	27.4	32.3	28.4	29.4
3–4 km (%)	44.4	33.1	32.8	37.4
Over 4 km (%)	28.2	34.6	38.8	33.2
Political orientation** $\chi^2 (9) = 32.21$				
Left-wing + Centre-left (%)	30.76	31.40	27.53	48.96
Centre (%)	7.69	6.31	1.45	3.73
Centre-right + right-wing (%)	21.36	19.58	17.39	11.62
Did not declare it (%)	40.19	42.71	53.63	35.69

Source: questionnaire administered to a representative sample of 841 residents in the area of Modena, Italy.
Notes: Significance at: *p < .05 and **p < .001.
Means with different subscripts in the same line differ from each other at post-hoc test by at least p < .05.