Teachers and Decision-Making Processes: An Italian Exploratory Study on Individual and Collaborative Decisions

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Abstract

This research was aimed at highlighting the decision-making processes of Italian teachers; in particular, we have focused on individual and collaborative decisions developed both during meetings and in the classroom. The study has underlined the features of teachers' decisions when decisions are made in groups and individually. A questionnaire was administered to teachers (N=411) of Italian basic schools (pupils aged between 3 and 14 years old) and, in addition, we observed 18 meetings. The findings of this research indicate the main modalities for teachers' decisions when they work individually or in groups. For group decisions, we emphasize the level of teachers' involvement during meetings and how the participants process the information; from an individual point of view, we pinpoint the main features of instructional decisions and what types of heuristics and biases teachers use during instructional activities.

Résumé

Cette recherche mis en évidence les processus de décision des enseignants italiens à l'école. En particulier, nous nous sommes concentrés sur les décisions individuelles développées dans la classe et sur les décisions en group pendant les réunions. L'étude a souligné les caractéristiques des décisions des enseignants lorsque les décisions sont prises en groupe et individuellement. Un questionnaire a été administré à des enseignants (N = 411) des écoles maternelle, élémentaires et du collège italiennes (élèves âgés entre 3 et 14) et, en outre, nous avons observé 18 réunions. Les résultats de cette recherche indiquent les principales modalités de décisions des enseignants quand ils travaillent individuellement ou en groupe. Pour les décisions en groupe, nous soulignons le degré d'implication des enseignants pendant les réunions et comment les participants traitent les informations; d'un point de vue individuel, nous identifions les principales caractéristiques de décisions pédagogiques et quels types d'heuristiques et d'erreurs sont utilisés par les enseignants pendant les activités en classe.

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Introduction

Decision-making processes have been studied in many fields: medical, legal, economic, military, in everyday life, factories, and service industries (Clemen & Reilly, 2001; Hastie & Dawes 2001). The theme of decision-making at school has been dealt with in several international studies, some focus on school effectiveness and the relationships between administrators and principals (David, 1994; Glasman & Fuller, 1992; Griffin, 1995; Hayes, 1996; Jenkins, Schrag, Rude, & Stowitschek, 1994; Kannapel, Moore, Coe, & Aagaard, 1995; Kreiner, 1976), and others focus on the teachers' instructional decisions that enhance the activities in the classroom (Maloch et al. 2003; McMillan, 2003; Nevo, 1995; Penso & Shoham 2003). Unfortunately, those important issues were not studied in Italy. For this reason, we carried out a survey aimed at highlighting the decision-making processes of the Italian teachers. In particular, we have focused on the individual decisions—which are developed when the teachers work in the classroom with the students—and on the collaborative ones, when the teachers debate among themselves during meetings. The context of the Italian schools is complex because an educational institution is composed of three distinct school levels, in which different kinds of teachers work. Furthermore, teachers of the different levels have to attend several meetings, where they debate mutual issues and questions concerning the educational life of the institution. So, it has been important to outline what kind of individual decisions are made in the classroom and, in parallel, the collaborative decision-making processes.

This study is located within the area of pedagogy, namely the processes that inform teachers' decisions when they are planning, carrying out, and evaluating their lessons. Kohler, Henning, and Usma-Wilches (2008) suggest that:

> Decisions during teaching might focus on whether students are learning or the types of adjustments that are needed, and judgments made after teaching could determine the types of feedback or grades that students should receive or the need for follow-up activities. All of these decisions are influenced by the ongoing classroom context, as well as a teacher's experiences, values, and knowledge of content, pedagogy, and individual students. (Kohler et al., 2008, p. 2108)

In addition, the individual decision-making processes are closely connected to those of the group of teachers and other actors who work or are linked with the school environment. According to Huber (2003), decision-making develops through modalities that arise from individuals and groups. A school is formed by professionals who operate autonomously (principals and teachers) but individual decisions are linked with decisions developed in groups, either formally or informally. For these reasons, teachers need to take cognisance of their own decisions as well as those of their colleagues and others involved (students, parents, administrative staff, etc.). Equally within the profession, teachers cannot be considered simply as managers of standardised processes but as reflective practitioners (Schön, 1983) who can decide and choose meaningful educational paths because the decision-making process is oriented to the improvement and the growth of students' learning.

Theoretical framework

Individual decisions

This study is informed by two main theories: 'prospect theory' (Kahneman & Tversky, 1979) and 'bounded rationality' (Simon, 1955). Prospect theory refers to the decision-making processes that result from the observation of the actual chosen behavior patterns. Prospect theory explains the 'framing effect'; that is, the same problem can determine different decisions if it is described in different ways (Tversky & Kahneman, 1981; Tversky & Kahneman, 1986). The framing effect can be defined as a mental structure that simplifies and leads to the understanding of a complex reality, forcing the individual to observe the situation from a particular perspective. The frame can be visualised as the setting in which the decision is placed (Pravettoni & Vago 2007, p. 10). This effect is very important for teachers because they tend to observe the classroom, pupils, and colleagues through various frames.

The second theory is called 'bounded rationality' (Simon, 1955), which advances a number of perspectives; namely, that people cannot have complete information about the question or the problem on which they have to decide, people do not have a stable preference system, and people do not have unlimited calculating capabilities.

> The human rational behaviour is shaped by a scissors whose two blades are the structure of task environments and the computational capabilities of the actor. (Simon 1990, p. 7)

The structure of school-environment produces a lot of contrasting information. Teachers, like everyone, cannot manage a large amount of information in real time, so they have to use some heuristics—that is, cognitive short cuts—which do not assure the best choice but they allow easier procedures to reach decisions in a short time (Bonini, Del Missier, & Rumiati, 2008, p. 23). Obviously, if the decision-maker considers too little information or he/she decides in a hurry, he/she risks simplifying the decision-making too much. Such simplification causes some biases; that is, the tendency to make systematic decisions in certain circumstances based on cognitive factors (Gilovich, Griffin, & Kahneman, 2002). It is important to underline both the heuristics and the biases in such a manner that teachers can realise the difficulties of the decision-making processes and find new ways to take better solutions for the instructional contexts.

Availability heuristic. The availability heuristic is a phenomenon in which people predict the frequency of an event based on how easily an example can be brought to mind (Tversky & Kahneman, 1974, p. 1127). The systematic use of this heuristic can, however, change in a cognitive bias because it can lead one to make poor judgements in some circumstances.

Representativeness heuristic. For the representativeness heuristic, an event is judged to be probable to the extent that it represents the essential features, so people tend to judge the probability of an event by finding a comparable known event and assuming that the probabilities will be similar (Tversky & Kahneman, 1974). The instructional bias connected to this heuristic is named 'extension neglect' because, unless attention is specifically directed to it, the amount of information on the new set has little or no influence on its valuation (Kahneman & Tversky, 2000, p. 708).

Anchoring and adjustment heuristic. The anchoring and adjustment heuristic is defined as a process through which people make estimates by starting from an initial value that is adjusted to yield the final answer (Tversky & Kahneman, 1974, p. 1128). This heuristic

is associated with the 'confirmation bias'; that is, the tendency for people to favour information that confirms their preconceptions or hypotheses regardless of whether the information is true (Plous, 1993, p. 233). An awareness and understanding of various heuristics can facilitate reflection on the part of teachers and impact upon their decision-making approaches.

Decisions in group

From a theoretical point of view, an effective group decision-making process develops in the following phases: identify the problem, generate various ideas and solutions and evaluate them, collect and share relevant information, then choose the option that is most suitable to the problem and that can satisfy expectations (Gilardi & Guglielmetti 2007). However, this normative model cannot actually be carried out because the social interaction between the members changes the paths of the information, which are adapted to the relationship between the participants and their own cognitive capabilities.

As with the individual decision, the decision-making process in groups is usually simplified by the members who abbreviate the path and cut out some points of the discussion. Such simplification causes other biases. The first group bias is named 'social influence' because the individual opinion, behaviour, attitude, and modality of information retrieval change depends on the social interaction, which occurs within the group. The second bias is called 'social projection' because each member decides on the basis of hypotheses about the intents of other members. Finally, the third bias is the 'false consensus,' or rather, the individuals' tendency to consider implicitly that their own opinions are approved by other members (see Gilardi & Guglielmetti, 2007, p. 94-95).

The useful information for the decision-making process may or may not emerge, depending on both group structure and composition. For example, if a teacher thinks that his/her decision is shared with the group (false consensus), he will tend not to be explicit in his/her information to the group. So, it is important to distinguish the various kinds of information, which occur during the meetings to identify them and, if necessary, lead them to the right direction.

The first typology of information is named 'common' because it is known by all members before the beginning of the discussion; the second typology is called 'unique' because it is known by only one member before the discussion; and the last typology is named 'partially shared' since it is known by some members before the discussion (Dennis, 1996, p. 533).

It is clear that the useful information to deal with the decision-making processes is not shared homogeneously between the members. One of the first tasks of the meeting leader (principal or teacher appointed by the principal) is to promote an interaction structure that facilitates the relevant information-sharing between the participants and the search for further information. Otherwise, the decision-making will only be based on 'common' information, which is usually less, compared to the 'unshared' information. As a matter of fact, groups tend to discuss the information already known by all members and they do not examine the information known by a single member. The unshared information is debated only at the end of the meeting. This information will have a minimal impact on the decision-making process (Zappalà & Fraccaroli, 2008, p. 211).

On the basis of the use of this information (Dennis, 1996; Propp, 1997) the decision-making process might be functional or dysfunctional for the purpose of the meeting. Therefore, it is necessary to ask what factors (and relating biases) are useful for a good decision-making process in a group.

The communicative factors. The first factor is related to the sharedness bias: "Groups communicate predominantly about information, which all or most group members share before entering the discussion, and neglect unshared information, which only one or few members have initially" (Klocke, 2007, p. 440). The confirmation bias (like in individual situations) is the second factor; that is, the tendency of the members to look for only the useful information to confirm the decision already taken by the group. But, "even when all information necessary to identify the correct solution is exchanged during discussion, individual group members often stick to their initially preferred solution. People bias their information processing to favour an initially preferred alternative" (Klocke, 2007, p. 441). This is the third factor, the preference bias.

The non-communicative factors. The non-communicative factors are as follows: group composition, role value, and task structure. The first is related to the group formation. Usually, homogeneous groups tend to select the information linked to the initial preference (Gilardi & Guglielmetti, 2007, p. 100), so it is important to create opportunity for discussion to solicit other information and to dissent and query the first decision. The second factor underlines the role value for the selection and the distribution of information. Wittembaum (1998) show that members, who are seen as competent for the task, have a high-level status and, consequently, they influence the decision-making process more. The structure of the task is connected with the interaction styles and the selection and sharing of information in the group (Hirokawa, 1990; Van Ginkel & Van Knippenberg, 2008). Decision-making processes can be improved if the members have a common representation of the task (Gilardi & Guglielmetti, 2007, p. 108).

Studies show that, in the groups, there is usually an individual tendency to conceal the information concerning the task (Devine, 1999, p. 609). In this case, the group does not develop a common representation of the task and the members consider and use the information differently, according to the specific individual task representations. Therefore, inside the same meeting, many other meetings develop with various aims. So, individual and sub-groups decision-making processes clash because the starting line (what I think it is important to do in the meeting) is different. Hence, it is necessary to enable members to share expectations about the meeting to remove social and psychological barriers; in this way, participants may develop new ideas and approach the meeting in a new way (Van Ginkel & Van Knippenberg, 2008, 83).

In the face of such issues, the idea of Professional Learning Community can support the development of the teachers in order to improve their own abilities in the collaborative decision-making processes. A group of teachers can become a professional learning community aimed at improving the educational environments in such a way that pupils can experience meaningful learning activities. In particular, a professional learning community

> refers to a way of operating that emphasizes the importance of nurturing and celebrating the work of each individual staff person and of supporting the collective engagement of staff in such activities as the development of a shared vision of schooling and learning, capacity building, problem identification, learning, and problem resolution. It is an environment in which staff can learn continuously and continually increase their ability to create the environment they desire. [...] A professional learning community is exemplified by collaborative work that is grounded in reflective dialogue, in which staff have conversations about students, teaching, and learning, identifying related issues and problems and debating strategies that could bring about real change in the organizational culture. (Ontario Ministry of Education, 2005, p. 53)

In order to create a professional learning community (DuFour, 2004), it is important to improve the collaborative efforts, even if it

> may seem at first to be hard to organize and keep going, yet under the PLC model of small groups working together within a larger group, the collaborative teams can be organized as either academic, grade level, or any other sub group that works well within the framework of what the PLC's are hoping to accomplish. (Norwood, 2007)

The concept of Professional Learning Community is seen as an effective staff development team approach and a powerful strategy for school change and possible improvement.

Research design

Research questions and variables

This research study focuses on the ways in which teachers make instructional decisions individually and in groups. We chose two connected basic questions and subdivided them into further specific sub-questions.

1. How do teachers decide in a group? In particular:
   a) What is the level of involvement of teachers during meetings?
   b) How do the participants process the information?
   c) What is the decision procedure, or rather, which are the methods and types of decisions occurring during meetings?

2. How do teachers decide individually? In particular:
   a) What are the main features of instructional decisions?
   b) What types of heuristics and biases are used by teachers?

For the first question, the independent variable is represented by the size of the group. In fact, the operationalisation of this variable is the number of participants: meetings with more than 15 teachers are named Big Meetings; otherwise, meetings with less than 14 members are called Small Meetings. For the second question, we wanted to identify the characteristics of instructional decisions taken during the classroom activities. So, the independent variable is represented by the different times at which teachers take the instructional decisions. The operationalization is as follows:

- before the activities, or rather, while teachers are planning the actions in the classroom;
- during the activities in the classroom with the students;
- after the activities, while teachers think about and assess their own actions.

The context

The research involved eight basic schools with children aged from 3 to 14. The Italian teachers of the basic school are divided into three levels according to the following school levels:

- infance or maternal school, with children aged between 3 and 5. This level is not compulsory;

- primary school, with children aged between 6 and 10.
- lower secondary school, with pupils aged from 11 to 14. The last two levels are compulsory.

All three levels are included in a sole organization called "Comprehensive Institute," led and managed by a principal who has to arrange a lot of meetings, grouped in two main typolgies: big and small meetings. The former involves all teachers of the three levels, so the number of participants is high (from 30 up to 100 teachers); instead, the latter can gather the teachers of a single level or a single class/grade, but there are also meetings with a small group of teachers representative of different levels to discuss projects or topics concerning issues connected with all levels and classes/grades. In any case, the number of participants is low (up to 12-15 teachers).

Consequently, the big meetings are focused mainly on the administrative and organizational topics, whereas the discussion carried out in the small ones is concentrated on educational and instructional issues (curriculum planning, assessment, etc.).

Participants and procedure

We used two main instruments:

1. A questionnaire administered to teachers (N=411) to collect quantitative data; five-point Likert scale was used to register teacher responses to the items and it ranged from 'only rarely' = 1, 'sometimes' = 2, 'about half the time' = 3, 'frequently' = 4, 'always' = 5. The reliability of the instrument was measured through the Cronbach alpha (α) according to the scores indicated in the tables. The questionnaire was aimed at responding to the questions 1a, 1b, 2a, and 2b;

2. Observation of 8 big meetings and 10 small meetings. The observation was structured with a check-list shown in the following Table 2; it was aimed at responding to the question 1c.

For the above-mentioned reasons, the questionnaire was composed of 2 areas: group and individual decisions. Each area was split up into some sub-areas connected to the sub-questions, as shown in Table 1 and Table 2.

Table 1.
The structure of questionnaire.

Area	Group decisions		Items	α	Sample items
Sub-areas	(1a) Involvement of participants	Involvement in the big meetings	3	.767	I participate actively in the discussion during big meetings
		Involvement in the small meetings	5	.831	I'm usually involved in the small meetings
	(1b) Information processing	Information in the big meetings	3	.569	I can share the information with other participants during big meetings
		Information in the small meetings	5	.752	The discussion is thorough during small meetings

Area	Individual decisions	Items	α	Sample items
Sub-areas	(2a) Features of instructional decisions	5	.734	I take into account the instructional methods while I'm planning the lessons
	(2b) Heuristics used by the teachers	3	.694	To decide what I have to do in the classroom, I try to remember similar activities that I carried out in the past
	(2a/b) Instant decisions	5	.723	When I change a decision in the classroom, it depends on the behaviour of the students
	(2a/b) Thinking about decisions	4	.592	I think about my own decisions together with my colleagues

We observed also 18 meetings to identify decision methods and styles. In the following table, we show the check-list with relating indicators. Observers had to indicate the different decisional events and, after that, they appointed the score or the choice according to the indicators. The procedure of validation has been carried out as follows: every meeting has been observed by two referees in such a way that the teachers could not see them. The observers indicated independently the decision-making moments. Afterwards, all observers met to underline the decision-making moments indicated by both. Subsequently, they compared the score; if it was the same, they recorded it, otherwise it was eliminated.

Table 2
The observation check-list.

	Area	
Sub-areas	(1c) decision procedures	Decision styles - 3 levels: from 'unshared information' to 'shared information'
		Decision methods - Majority-Autocratic-Tradition-Negotiation
	(1c) discussion styles and types	Discussion styles - 3 levels: from 'absence of discussion' to 'deep discussion'
		Decision types: Organizational decisions-Instructional decisions
	(1c) participation levels	Number of participants
		% of participants who had the floor at least once
		% of participants who had the floor twice or more

Results

Data analysis

Research question 1. How do teachers decide in group? In order to answer the first question, the data was analysed from sub-questions 1a and 1b (questionnaire) and 1c (observation). Table 3 shows the results from questionnaire's items related to group decisions. Data have been processed with SPSS.

Table 3.
Results for 'group decisions' from the questionnaire – questions 1a and 1b.

	Area – group decisions	
	(1a) Involvement in the meetings	(1b) Information processing during the meetings
	M (SD)	M (SD)
Big meetings	2.81 (.97)	2.92 (.85)
Small meetings	3.65 (.81)	3.85 (.80)

We can underline the low level of involvement for the big meetings compared to the high level during small ones. Likewise, participants are able to present, process and discuss the information during small meetings whereas they cannot discuss thouroghly during big meetings. After the observation through the check-list, we could identify the decision methods and styles. We counted the frequencies of the decision-making moments noted by the observers, indicating the relating percentage. Table 4 displays the results divided in the check-list's areas and factors connected to the question 1c, indicating what the methods and types of decisions occurring during meetings are.

Table 4.
Results for 'group decisions' from the observation – question 1c.

	Area – group decisions			
Area		Factors	Big meetings	Small meetings
Decision procedure	Decision styles	Unshared information	34.4%	34.2%
		neutral	24.1%	21.1%
		shared information	41.3%	44.8%
	Decision methods	majority	69%	62,5%
		autocratic	20.7%	0%
		tradition	0%	6.3%
		negotiation	10.3%	31.3%
Discussion styles and types	Discussion styles	Absence of discussion	20.7%	18.9%
		neutral	72.3%	64.8%
		deep discussion	6.9%	16.2%
	Decision types	Organizational	51.7%	23.5%
		Instructional	20.7%	50.1%
		Other types	27.6%	26.4%
Participation levels	participants	M (SD)	55.6 (25.1)	10.7 (4.4)
	participants who had the floor at least once	M (SD)	44.1% (28.9)	90.8% (14.1)
	participants who had the floor twice or more	M (SD)	35.4% (27.1)	64.8% (28.2)

The various percentages indicate the frequency of the score or the choice on the basis of the total amount of decisional events. The first data are related to the decision procedure. During big meetings, the participants sometimes discuss without sharing information (34.4%) and, sometimes, they are able to exchange relevant and unshared information (41.3%). Likewise, during small meetings, the participants use all kinds of decision styles, from unshared (34.2%) to shared (44.8%) information. We can observe a small improvement to the sharing information. We can underline this effect also in the choice of decision methods between majority, autocratic, tradition, and negotiation. Teachers use mainly the majority method in both types of meetings, but we can observe a marked increase of negotiation during small meetings (31.3%).

Teachers are able to discuss thoroughly during small meetings (16.2%). It is more difficult to start a deep debate during big meetings (6.9%). Further, another difference is found in the decision types. Participants are more concentrated on the organizational decisions during big meetings (51.7%); in contrast, the instructional decisions are the main focus during small meetings (50.1%). The former are connected to the functioning of the school as an institution, the latter should be linked to the instructional activities in the classroom.

Obviously, the number of participants is bigger for the big meetings compared to the number of participants in the small ones. But the most interesting data are as follows: in the big meetings, only 44.1% of participants had the floor and 35.4% talked at least twice. Instead, in the small meetings, 90.8% of participants talked once and 64.8% had the floor for at least twice or more times. These data confirm the high-level of involvement in the small meetings and the low-level in the big ones, found in the questionnaires. The relationship between the data gathered with these two different instruments allowed us to observe the decision-making process perception by the teachers and the real decisions taken during the meetings.

Research question 2. How do teachers decide individually? In order to answer the second question, we analysed the data collected by the parts of questionnaire dedicated to the sub-questions 2a and 2b. Tables 5 and 6 show the data relating to the main features of instructional decisions and what types of heuristics are used by teachers during classroom activities. Such activities are divided into three basic phases: before lessons, while teachers are planning the actions that they will carry out in the classroom; during lessons, while teachers are working in the classroom with the students; and, finally, after lessons, when teachers think about their own activities and, consequently, their own decisions.

Table 5.
Results for 'individual decisions' – question 2a.

Area – individual decisions			
Features of instructional decisions			
		M	SD
Before activities – during instructional planning	Contents	4.11	.75
	Methods	4.29	.61
	Classroom management	4.11	.75
	Assessment	3.72	.84
	Students' characteristics	4.43	.64
During activities – in the classroom with the students (instant decisions)	Contents	2.16	.99
	Methods	2.50	1.01
	Classroom management	2.82	.99
	Assessment	2.94	.94
	Students' characteristics	3.21	1.01
After activities – Thinking about decisions	Alone	4.07	.91
	With some colleagues informally	3.77	.76
	With some colleagues formally	3.96	.84
	During small meetings	3.50	.95

Table 6.
Results for 'individual decisions' – question 2b.

Heuristics		
	M	SD
Availability	3.78	.67
Representativeness	3.61	.73
Anchoring and adjustment	3.86	.74

Data indicate that, during the planning, teachers' decisions are mainly focused on students' characteristics and methods that they intend on using in the classroom. However, classroom management and contents are also important parameters. In contrast, the assessment is not seen as the most important factor for the decisions during instructional planning. During the activities in the classroom, teachers still consider the students' characteristics as the basic point for instant decisions but, in this case, the assessment is considered as the second factor. After the activities, teachers think about their own decisions mainly alone but also with their colleagues during formal and informal contexts. Teachers, among the main heuristics, use the anchoring and adjustment followed by the availability and the representativeness.

Discussion

Comments and remarks

Research question 1. How do teachers decide in group? The data from this study indicate a number of points. If a meeting is attended by too many people (over 15 members),

all participants are not able to take part actively because the interactive structure and the meeting time do not allow everyone to take the floor. However, we observed different degrees of participation in the big meetings: very low in some meetings, in which there were 30 participants, and high in other ones, in which there were approximately 75-80 participants. How can we explain such a phenomenon? Involvement depends not only on the number but also the topics and the decision method (connected to the leadership style). If the principal (or the leader) uses an autocratic method, the discussion tends to decrease. In addition, if the agenda is related to topics far from the interest of the participants, the involvement tends to be weak. In contrast, the big meetings managed with a style based on negotiation involve the participants thoroughly. Consequently, we can state that the improvement of negotiation abilities is one of the main objectives for a good decision-making process in a group because it tends to favour the sharing of relevant information. Furthermore, Table 4 indicates that organizational decisions are the main decisions taken during big meetings. Such type of decisions is seen as remote by the teachers because they are more concentrated on the issues related to the classroom actions discussed during small meetings. So, we can state that teachers' level of involvement during meetings (1a) is higher during small meetings because they can discuss and debate topics considered as important and they can present the unshared information more easily.

The last sentence introduces the answer to the question about the information processing during group discussion (1b): teachers can process the information mainly during small meetings because they have many opportunities to take the floor and voice their own opinions. For the last sub-question (1c), the decision procedure is mainly based on the majority method but it does not ensure a good decision-making process and the involvement of members. Instead, the negotiation style supports and solicits teacher participation.

Research question 2. How do teachers decide individually? Teachers individual decisions are mainly based on the heuristic of anchoring and adjustment. In this case, teachers base their decisions on some activities that play the role of benchmarks, then they can modify them during the action in the classroom. The availability heuristic is also used by teachers. In a school environment, it means that teachers try to remember how often they used a teaching method or dealt with a specific topic. If they remember many events of such a type, it is more likely that the decision-making will be oriented in that direction. If teachers repeat such decisions without reflection and if they do not consider the variables of the new situation important, the shortcut changes into a bias. In this case, they could tend to refuse to analyse new information and they could repeat their methods or contents without taking into account the pupils' needs or different times and spaces. Finally, for the representativeness heuristic, the example is as follows: when teachers want to carry out an activity, they think about its characteristics: methods, times, contents, etc. They are likely to look for similar activities developed in the past with analogous features. They tend to take the same decision if the past activity presents similar characteristics. In this way, the risk is to categorize the educational situations, simplifying them progressively. In fact, the instructional bias connected with this heuristic is related to the categorization; that is, the decision-maker could tend to create instructional stereotypes, which become teaching methods used daily without reflection.

The features of teachers' individual decisions are based on students' characteristics and teaching strategies, but we would like to emphasize this datum relating to the assessment. It is not considered an important factor when the teachers plan the lessons, but it becomes fundamental for instant decisions during the actions in the classroom. Data indicate an overall reduction of the features for the instant decisions, probably because teachers are less aware of decisions changes during the action. As indicated by Kohler et al. (2008), teachers change many decisions during the activities through micro-decisions that they take in a very short

lapse of time. They are mainly based on students' feed-back and micro-assessments, indicating that teachers have to change something to better carry out the lesson. For this reason, it is convenient to design some reflective and meta-cognitive times during lessons, to improve the effectiveness of instant decisions for teachers and students. Likewise, the self-evaluation after lessons might help teachers in arranging a new way for planning, avoiding biases.

Conclusion

The findings of this research indicate the main modalities for teachers' decisions when they work individually or in groups. Our main purpose was to look for important implications for teachers' decision-making practices at school, in such a way that teachers can improve the teaching/learning activities in the classroom. For group decisions, we found that the sharedness bias is located mainly in the big meetings, and that small meetings facilitate the sharing information instead. For this reason, small meetings can become the basic benchmark for decisions in groups. For good management of the big meetings, it is better to manage the decision-making process through some small group discussion methods like the devil's advocate (De Dreu & West, 2001) or the delphi technique (Clayton 1997). In addition, we can suggest some professional development methods for teachers like the Critical Decision Making (Crandall, Klein, & Hoffman, 2006) or the Problem-Based Learning (Edwards and Hammer 2006), which allow teachers to revise and highlight the key moments of the decision-making process experienced in a real situation. Furthemore, Cooley (1994) suggests three steps: mapping, mirroring, and mining/refining to be more aware of group decisions.

The confirmation and preference biases are located both in big and small meetings, so it is convenient to modify the group composition and improve the sharing of task representations. The negotiative leadership style seems the better way to carry out the meetings because it permits, on the one hand, a high-level of participation and, on the other hand, a thorough discussion.

From an individual point of view, Italian teachers use the heuristics already studied by other research fields, but we can underline the decisions' features taken before, during, and after classroom activities. In particular, we would like to point out the basic roles of assessment and students' characteristics to take functional decisions. The main skill for teachers is the capability to observe and read the variables of the instructional environments and, reflecting on them, train themselves to be aware of their own decisions in order to avoid biases.

Ultimately, our study highlights the fact that decision-making capability is one of the basic points for teacher professional development (Schnellert, Butler, & Higginson, 2008). The central idea that represents the basis for the fostering of decision expertise is the development of negotiation (Winograd, 2002) because, first, it is the point of contact between individual and group decisions and, second,

> negotiation is the only strategy to reach an agreement between two actors with divergent interests. Paradoxically, two colleagues can agree that they disagree on some issues but they can mutually commit themselves to deal with them. (Rumiati & Pietroni, 2001, p. 23)

References

Bonini, N., Del Missier, F., & Rumiati, R. (Eds.) (2008). *Psicologia del giudizio e della decisione*. Bologna: Il Mulino.

Clayton, M.J. (1997). Delphi: A technique to harness expert opinion for critical decision-making tasks in education. *Educational Psychology: An International Journal of Experimental Educational Psychology, 17*(4), 373-386.

Clemen, R.T., & Reilly, T. (2001). *Making hard decisions with decisiont tools*. Belmont, CA: Duxbury Press.

Cooley, E. (1994). Training an interdisciplinary team in communication and decision-making skills. *Small group research, 25*(1), 5-25.

Crandall, B., Klein, G.A., & Hoffman, R.R. (2006). *Working minds: A practitioner's guide to cognitive task analysis*. Cambridge: MIT Press.

David, J.L. (1994). *School-based decision-making: Linking decision to learning*. Lexington: The Prichard committee for Academic Excellence.

De Dreu, C.K.W., & West, M.A. (2001). Minority dissent and team innovation: The importance of participation in decision making. *Journal of Applied Psychology, 86*(6), 1191-1201.

Dennis, A.R. (1996). Information exchange and use in small group decision making. *Small Group Research, 27*(4), 532-550.

Devine, D.J. (1999). Effects of cognitive ability, task knowledge, information sharing, and conflict on group decision-making effectiveness. *Small Group Research, 30*(5), 608-634.

DuFour, R. (2004). Schools as learning communities. *Educational Leadership, 6* (8), 6-11.

Edwards, S., & Hammer, M. (2006). Laura's story: Using Problem Based Learning in early childhood and primary teacher education. *Teaching and teacher education, 22* (4), 465-477.

Gilardi, A., & Guglielmetti, C. (2007). Quando a decidere è il gruppo. Teorie e modelli di presa di decisione. In G. Pravettoni & G. Vago (Eds.). *La scelta imperfetta. Caratteristiche e limiti della decisione umana* (pp. 87-122). Milano: McGraw-Hill.

Gilovich, T., Griffin, D., & Kahneman, D. (2002). *Heuristics and biases: The psychology of intuitive judgment*. Cambridge: Cambridge University Press.

Glasman, N., & Fuller, J. (1992). Assessing the decision-making patterns of school principals. *International Journal of Educational Management, 6*(3), 22-30.

Griffin, G.A. (1995). Influences of shared decision making on school and classroom activity: Conversations with five teachers. *The Elementary School Journal, 96*(1), 29-45.

Hastie, R., & Dawes, M.D. (2001). *Rational Choice in an uncertain world*. Thousand Oaks, CA: Sage.

Hayes, D. (1996). Taking nothing for granted: The introduction of collaborative decision-making in a primary school. *Educational Management & Administration, 24*(3), 291-300.

Hirokawa, R.Y. (1990). The role of communication in group decision-making efficacy. A task-contingency perspective. *Small Group Research, 21*(2), 190-204.

Huber, G.L. (2003). Processes of decision-making in small learning groups. *Learning and Instruction, 13*(3), 255-269.

Jenkins, J.R., Schrag, J., Rude, J., & Stowitschek, C. (1994). Effect of using school based participatory decision making to improve services for low performing students. *Elementary School Journal, 94*(3), 357-372.

Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica, 47,* 263-291.

Kahneman, D., & Tversky, A. (2000). *Choices, values, and frames*. New York: Russell Sage Foundation.

Kannapel, P.J., Moore, B., Coe, P., & Aagaard, L. (1995). Six heads are better than one? School-based decision making in rural Kentucky. *Journal of Research in Rural Education, 11*(1), 15-23.

Klocke, U. (2007). How to improve decision making in small groups: Effects of dissent and training interventions. *Small Group Research, 38*(3), 437-468.

Kohler, F., Henning, J.E, & Usma-Wilches, J. (2008). Preparing preservice teachers to make instructional decisions: An examination of data from the teacher work sample. *Teaching and Teacher Education, 24*(8), 2108-2117.

Kreiner, K. (1976). Ideology and management in a garbage can situation. In J.G. March, & J.P. Olsen (Eds.). *Ambiguity and choice in organizations* (pp. 156-173). Bergen: Universitetforlaget.

Maloch, B., Flint, A.S., Eldridge, D., Harmon, J., Loven, R., Fine, J.C., Bryant-Shanklin, M., & Martinez, M. (2003). Understandings, beliefs, and reported decision making of first-year teachers from different reading teacher preparation programs. *The Elementary School Journal, 103(5),* 431-457.

McMillan, J.H. (2003). Understanding and improving teachers' classroom assessment decision making: Implications for theory and practice. *Educational Measurement: Issues and Practice, 22*(4), 34-43.

Nevo, D. (1995). *School-based evaluation. A dialogue for school improvement*. Oxford: Pergamon Press.

Norwood, J. (2007). Professional learning communities to increase student achievement. *Essays in Education, 20*, 33-42.

Ontario Ministry of Education. (2005). *Education for all: The report of the expert panel on literacy and numeracy instruction for students with special education needs, kindergarten to grade 6*. Ontario Education. Retrieved from http://www.edu.gov.on.ca/eng/document/reports/speced/panel/speced.pdf

Penso, S., & Shoham, E. (2003). Student teachers' reasoning while making pedagogical decisions. *European Journal of Teacher Education, 26*(3), 313-328.

Plous, S. (1993). *The psychology of judgment and decision making*. New York: McGraw Hill.

Pravettoni, G., & Vago, G. (Eds.) (2007). *La scelta imperfetta. Caratteristiche e limiti della decisione umana*. Milano: McGraw-Hill.

Propp, K.M. (1997). Information utilization in small group decision making. A study of the evaluative interaction model. *Small Group Research, 28*(3), 424-453.

Rumiati, R., & Pietroni, D. (2001). *La negoziazione. Psicologia della trattativa: Come trasformare un conflitto in opportunità di sviluppo personale, organizzativo e sociale*. Milano: Cortina.

Schnellert, L.M., Butler, D.L., & Higginson, S.K. (2008). Co-constructors of data, co-constructors of meaning: Teacher professional development in an age of accountability. *Teaching and Teacher Education, 24*(3), 725-750.

Schön, D. (1983). *The reflective practitioner: How professionals think in action.* London: Temple Smith.

Simon, H.A. (1955). A behavioral model of rational choice. *Quarterly Journal of Economics, 69,* 99-118.

Simon, H.A. (1990). Invariants of human behavior. *Annual Review of Psychology, 41,* 1-19.

Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science, 185,* 1124-1131.

Tversky, A., & Kahneman, D. (1981). The framing of decisions and the psychology of choice. *Science, 211,* 453-458.

Tversky, A., & Kahneman, D. (1986). Rational choice and the framing of decisions. *Journal of Business, 59,* 251-278.

Van Ginkel, W.P., & Van Knippenberg, D. (2008). Group information elaboration and group decision. The role of shared task representations. *Organizational Behavior and Human Decision Processes, 105,* 82-97.

Winograd, K. (2002). The negotiative dimension of teaching: Teachers sharing power with the less powerful. *Teaching and Teacher Education, 18*(3), 343-362.

Wittembaum, G.M. (1998). Information sampling in decision-making groups. The impact of members' task-relevant status. *Small Group Research, 29*(1), 57-84.

Zappalà, S., & Fraccaroli, F. (2008). Decisioni di gruppo. In N. Bonini, F. Del Missier, & R. Rumiati (Eds.). *Psicologia del giudizio e della decisione* (pp. 205-224). Bologna: Il Mulino.