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Grounded Theory from Start to Finish: Applying Substantive Theorizing to Educational Research

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Abstract

The aim of this methodological article is to provide a practical example of the application of substantive theorizing to the area of educational research according to the principles of Grounded Theory. While most GT applications end up in a thematic-like manner of presentation and analysis by emphasizing open/substantive coding and how it is related to interview fragments, we attempt to highlight the move from connecting categories to making abstractions by using matrices. We suggest that substantive theorizing should entail 3 analytic stages which correspond to three different levels of abstraction: First, researchers have to clearly define the properties and the dimensions of the main categories as they emerged from in vivo coding, second, they have to provide matrices which show how categories are connected and, third, they must clarify how these connections cover the diversity of data bits and are explained by a core (theoretical) category

Keywords: Substantive theorizing, Intercultural education, Abstraction, Core category

1. Introduction

Glaser and Strauss' *Discovery of Grounded Theory* (1967) is methodologically innovative not only for the period in which it was originally set out but because it continues to exert a huge influence on practitioners of qualitative social research across various research fields today, too. Although the relevant scholarly literature has covered the reasons for *Discovery*'s popularity, we would like to underline that its novelty lies in the fact that rather than discussing verification Glaser and Strauss developed methodological arguments for how comparison-oriented research enables researchers to produce novel theoretical explanations. It is well-known that Strauss was trained in the Chicago School where fieldwork and participant observation dominated and whose theoretical origins were related to social interactionism and to the social

theory of Pragmatism. Within this context, the main ontological idea was that the social is imbued with meanings which are co-constructed through social interaction and that humans act on the basis of the meanings they attribute to social situations. Glaser, on the other hand, because his scientific formation had been influenced by his participation in Lazarsfeld's research program as it was practiced in Columbia University, drew on positivist-oriented methodologies (Hallberg, 2006, p.143). Despite these inconsistencies, in *Discovery* they put forward a switch in the gestalt of the dominant methodological paradigm as far as qualitative research is concerned by stating a rigorous and disciplined argument regarding how one should organize data collection and data analysis in order to develop theory (Bryant, 2017, p. 90).

GT scholars agree that the main powerful methodological contributions of this argument concern three interrelated issues: first, the distinction between substantive and formal theory, second, how constant comparison interacts with theoretical sampling and, third, the intermingling of deductive, inductive and abductive reasoning (Bryant, 2017, p. 95; Richardson & Kramer, 2006). Given that these three issues have been repeatedly dealt with by various theoretical points of view which have covered their implications for qualitative research (Bulawa, 2014), in this article we have organized our argument around two axes: first, we reconstruct these three issues in order to present GT's main methodological framework and, second, we apply them to qualitative material collected from a research project related to the field of intercultural education. Our purpose is to show how one could implement substantive theorizing according to GT's line of reasoning in the field of intercultural education. Despite its popularity in various fields like organizational sociology (Kempster & Parry, 2011), family studies (Gilgun, 1999) or the sociology of health and illness (Charmaz, 2004), GT's implementation in educational studies has not received similar attention as a discrete methodological tradition. We could provide three reasons for this neglect. First, in so far as Bourdieu's and/or Bernstein's theories are put into practice through deductive reasoning, there is no room left for theory development. Second, in so far as one makes use of statistical measures by means of a strict positivist point of view, the end result will be descriptivism obtained through inductive thinking. Induction-based generalization should not be identified with theory building because theories are not just summarizations of data as they have to explain them too. Finally, as far as qualitative research is concerned, in so far as one detaches qualitative research from causal explanation by drawing on phenomenological or interpretivist epistemologies, discovery of novel theory is difficult. In contrast to these three epistemological obstacles, GT proposes methodological arguments not only about theory development but also about the interconnection of qualitative and quantitative methods and about causal explanation.

2. Literature Review

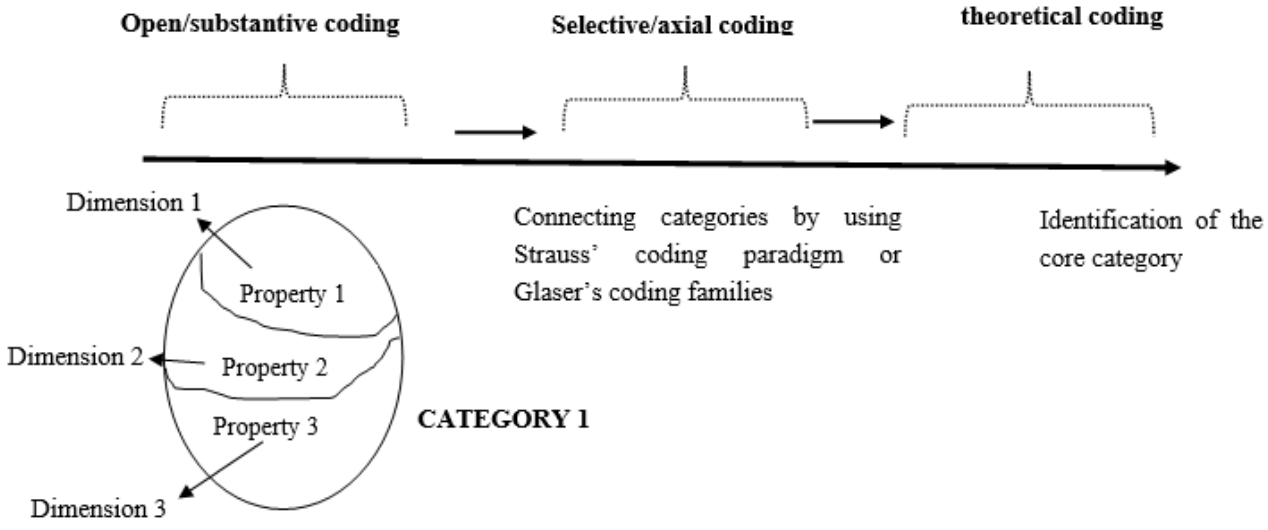
Before we present how we followed the methodological GT path from data to selective/theoretical coding in the field of intercultural education, we first discus how this procedure has been carried out in empirical research from various research fields. We will review them by focusing on how the move from the stage of connecting categories to the stage of identifying the core category has been carried out. Despite the fact that most of the articles' methodology section we reviewed refers to GT's coding, there is no explicit guidance as to how this move takes place. For instance, in Karpouza and Emvalotis' (2018, p. 3) application of GT methodology on the teacher-student relationship, there is no explicit presentation as to

how the central category ("the teacher-student relationship as a dynamic process") has emerged. Similarly, although Garcia-Romeu, Himelstein & Kaminker (2014) aimed at forging a mid-range theory of the process and outcomes of self-transcendent experience in healthy adults, they stated that "data were collected, coded, and thematically analyzed in iterative stages" (Garcia-Romeu, Himelstein & Kaminker, 2014, p. 636), without providing details as to how thematic and iterative analysis fueled their mid-range theory. Their use of codebook is even more confusing since they do not describe in detail how it has been collaborated with the axial and the selective coding processes. By choosing a thematic style of analysis, the research of Anderson & Connors (2020), Chong (2019) and Altun (2019) leave the impression that selective coding is identical to highlighting "patterns, shared insights, and central themes" (Anderson a& Connors, 2020, p. 333) or that there are no methodological details as to how these categories took shape (Chong, 2019, p. 7; Altun, 2019, p. 4). Bulawa (2014) has made an excellent attempt at clarifying how one could reduce the volume of the codes during open coding but the identification of categories' properties and dimensions are missing. When the time of abstraction comes, we are not provided with details as to how he distinguished categories from sub-categories. Even though the use of mind map is mentioned, there are no examples similar to the ones used for open coding so that readers make sense of how the substantive theorizing captures the main concern of his research participants. Thornberg's et. al (2013) research on school bullying follows the lead of Charmaz's version of GT by applying her coding scheme to interview material collected from 21 secondary-school and university students. After the initial coding, focused coding concerned the comparison of these codes to each other "to synthesise the large amounts of data into more elaborated categories. 'Victimising' identified as the core concept of the study as well as a set of other focused codes now delimited and guided the coding work" (Thornberg et al., 2013, p. 313). During theoretical coding, the research team was based on Glaser's version in order to explore how "the core concept and our other constructed codes or concepts were related to each other and integrated them into a grounded theory by using theoretical codes" (Thornberg et al., 2013, p. 314). In other words, in this piece of research, the act of connecting concerned comparison among codes and comparison among core concept(s) as they emerged from the second stage of analysis. Although it sounds straightforward, it is not clear how these kinds of connection implemented in the data. The main body of the article presents the core categories in a theme-like manner in order to bring to light the process of "victimization". Although an excellent piece of work and the promise of substantive theorizing is kept in so far as theorizing process provides the big picture of participants' main concern, the move from connecting categories to abstraction remains unstated. In a similar vein, Cresswell and Brown (1992), by asking chairpersons to discuss how they assist a faculty member in the department in his or her professional development, developed a four-fold typology describing the different contexts in which the process of chair assistance takes place. However, it is not clear how they handled cases which could be coded as belonging to two or more types, that is cases of overlapping. To sum up, except for Thornberg's and Cresswell and Brown's research, it seems that in most of the abovementioned GT research examples the main body of the analysis flows in a thematic style in the sense that themes and sub-themes have been divided in each of which specific interview fragments are presented. However, how one combines dimensionalizing with

substantive theorizing remains obscure and levels of abstraction and stages of analysis are confused in so far as themes and categories are treated interchangeably and the differences regarding their level of abstraction are lost. In this article we do not strive for methodological purity or to say what is the 'right' version of the GT method but to provide a possible context of justifying the move from category connections to making abstractions by stating clearly its analytic steps.

3. Dimensionalizing and the Distinction Between Substantive and Formal Theory

Even though Glaser and Strauss disagreed over whether immersion in scholarly literature forces data, they agreed on the concept-indicator model of concept formation according to which concepts have to be "dimensionalized" (Strauss & Corbin, 1990, pp. 116-119; Strauss, 1987, pp. 25-27; Glaser & Strauss, 1967, pp. 63-68; Larossa, 2005). In simple terms, this means that concepts are *categories* which are composed of *properties* each of which refers to specific *dimensions*. Properties, by tapping the variation of the category, constitute the aspects of the category and make them even sharper and more accurate regarding the range of incidents the category covers and the dimensions concern the values through which properties will be measured. As is well known, coding in GT comprises three stages, regardless of whether one uses Strauss's (open-axial-selective) or Glaser's terminology (substantive-selective-theoretical). Coding in the first stage aims at generating codes as emerged from the data, in the second stage researchers should make connections between categories and properties and in the third stage the aim is to identify the core category which explains the main concern of the phenomenon of interest which might be either a specific outcome (for example, participating in the Erasmus programs) or a process and how something evolves through time (for example, the decision-making process through which one changes his/her mind in the university in order to follow another object of study, or the decision-making process to attend postgraduate studies) (Graph 1). Although stated in terms of stages, this is only a metaphorical convention because in practice the coding process is iterative (a permanent back and forth between data and coding is at work) and has to be seen as a continuum in the sense that even when one carries out selective coding, (s)he goes back to substantive codes either for verification reasons or for refining the established categories by handling deviant cases.

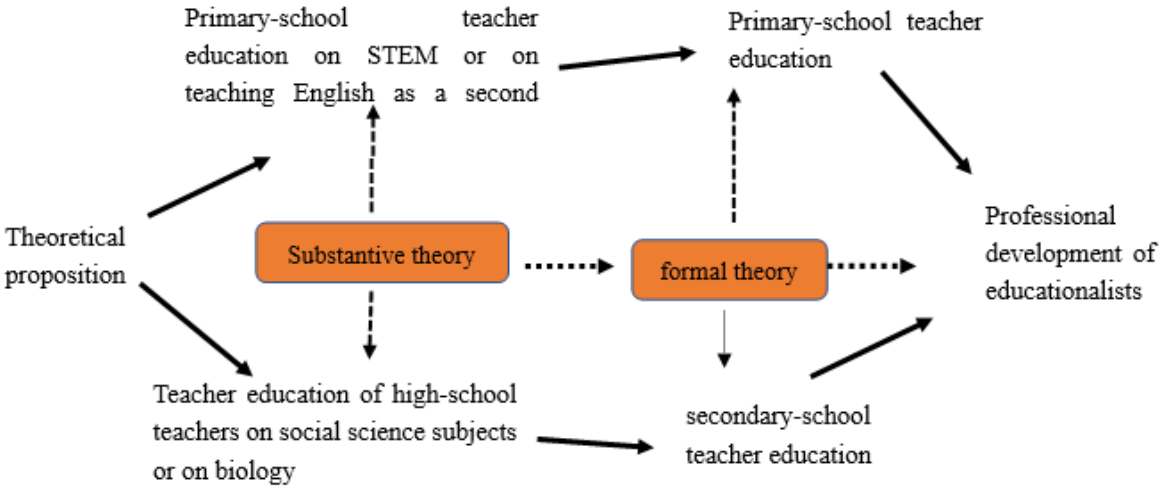


Graph 1. Dimensionalizing and the three coding stages in Grounded Theory

While the first stage of coding can be easily carried out by novice and experienced researchers alike, the most intriguing (but difficult) operation concerns how one will make connections between categories and properties so that substantive theorizing may emerge from data. Strauss and Corbin's (1990) coding paradigm and Glaser's (1978) coding families constitute theoretical toolboxes through which researchers can empower their theoretical sensitivity in order to forge a theoretical explanation of the phenomenon of interest. This is where the distinction between substantive and formal theory comes to the fore. According to the famous passage:

"By substantive theory we mean theory developed for a substantive or empirical area of sociological inquiry, such as patient care, geriatric life styles, etc. …By formal theory we mean theory developed for a formal or conceptual area of sociological area such as status passage, stigma, deviant behavior, etc. Both types of theory may be considered 'middle range'; they fall between minor working hypotheses of everyday life and the 'all-inclusive' grand theories. Substantive and formal theories exist on conceptually ordered distinguishable levels of generality which differ only in terms of degree. In any one study each type of theory can shade at points into the other. The analyst, however, should focus clearly on one level or the other" (Glaser & Strauss, 1967: 32).

One should not infer from this passage that substantive theory is a-theoretical but that Glaser and Strauss introduce a crucial epistemological idea when researchers are grappling with the concept of theory, that is scope conditions. In particular, theoretical statements have to state what their scope is, that is the range of cases to which the causal propositions of statements apply. The degree of generality is what differentiates substantive from formal theory and in that sense, it would be better to approach them as a continuum (Graph 2).



Graph 2. The continuum from substantive to formal theorizing

A causal proposition which explains primary-school or high school teachers' education centered on a specific field concerns substantive theorizing and it is transformed into formal to the extent that it covers either primary-school teacher education or secondary school teacher education. The movement from substantial to formal theory means that the coverage in the formal theorizing is conceptual in the sense that the causal propositions concern the interconnections between various fields of teacher education. Identifying connections is a theoretical operation, not an empirical one. The same holds for the case in which one forges a theoretical proposition regarding the professional development of educationalists as a social group. So, by comparing substantive cases a formal theory is gradually formed and the scope conditions increase. While categories in substantive theories are empirical and in the formal they are conceptual, both of them are tied up with connecting things, but connection in formal theorizing is even more abstract.

4. Theory Development by comparing Dissimilarities

The distinction between substantive and formal theorizing explains why Glaser and Strauss never forgot the role of constant comparison as a method. When one forges substantive theory (s)he compares different groups of the same substantive type (groups of teachers attending teacher education on STEM methods and who obtained their pedagogy degree from various university departments). However, when one aims at formal theory (s)he will have to select dissimilar substantive groups for comparison (the previous groups on teacher education and groups of nurses attending nurse education on physical examination) in order to increase the scope of the theory. Maximizing differences between groups helps us extend the scope of the theory. This is where a huge contribution of the *Discovery* book lies since Glaser and Strauss (1967, pp. 55-60) repeatedly insist on comparing groups which are seemingly dissimilar on the empirical level but similar on the formal level. In other words, the comparability is conceptual and is highlighted by the researcher who brings to light causal connections which were unnoticed.

Traditionally, comparison made sense only to the extent that the comparability of things had been established through pre-defined criteria. By comparing similar things, one finds commonalities. However, this line of reasoning remains mute to the possibility of theory development because the end result of the comparison will verify its pre-defined criteria. In contradistinction to this line of thought, Glaser & Strauss (1967, pp. 61-62) prioritize the comparing of whatever data are inscribed within the same category or property, even if they seem non comparable at first sight. The goal is to bring to light conditions which make the categories different. Similarities and differences regarding conditions explain similarities and differences related to categories and to their properties. This is why they say that the criterion for making comparisons is the theoretical relevance, not empirical indices. Note that the groups to be compared are not always "out there" but they happen to be conceptually constructed and related to the researcher's analytic purpose, which means that their properties are not identical to those of "natural" groups. At this point a crucial role is played out by theoretical sampling because it is the analytic categories emerging from data that which sensitizes researchers to search for comparison groups. In that sense, the comparison may be both empirical (comparing novice biology and philology teachers attending teacher education) and conceptual (comparing theoretically-inclined teachers with those who prefer experiential teaching methods) (Urquhart, 2019). It follows that while two groups at the substantive level may be non-comparable, they are comparable at the formal level. A trick to achieve this goal may be to keep in mind that one can maximize or minimize differences in the following way. On the one hand, by minimizing differences researchers focus on similar bits of data concerning a category and in that way the category is verified and its properties are refined. In addition, by minimizing differences among comparison groups, one may bring to light the conditions within which the category is made. This is another way to talk about necessary conditions in the sense that "whenever the conditions exist, then the category is at work, as well". On the other hand, by maximizing differences between comparison groups, data variety regarding a category is increased but similarities among them are identified at the conceptual level (Glaser & Strauss, 1967, p. 37). Minimizing differences fits more when the aim is substantive theory but when the aim is to forge theoretical categories, that is connections, maximizing differences is a more fruitful operation. This is a fine opportunity for the researcher to start crafting causal propositions. In any case, the increase in the scope of the population comes through minimizing differences and the increase in the conceptual scope comes through maximizing differences. The more the researchers deal with the examination of various slices of data through which properties and categories are made sense of, the more the properties of the category are refined and the sharper its theoretical coverage becomes. By comparing seemingly dissimilar slices of data researchers are able to distinguish the phenomenon of interest from the case being studied. Thus, researchers may start their research by asking "what thing would you like to provide an explanation for after the research is over?" or "the instantiations of what case do your propositions provide an answer for?" and at the end of the research they should be able to respond to the question "what phenomenon are your findings a case of?".

5. Connecting Categories. A Challenging Task for Concept Formation

Although most of the applications of GT methodology in the various substantive fields have a lot to say on the initial coding, things start to become a little bit obscure when one tries to bring to light connections between categories, either in the sense of axial coding or in the sense of theoretical coding. The difficulty in finding methodological guidance lies in the fact that connecting categories is a conceptual move which has to be abstract enough to "communicate" with various bits of data and not so abstract as to force them. This middle-range level of abstraction should not be left only to researchers' capacities, as Kelle (2019, p. 73) argues, but can be approached through specific heuristic devices which enable researchers' intuition. Before proceeding to presenting such devices, we will say a few things about what categories actually are. Categories are conceptual constructions which do not need to tap only patterns, regularities or similarities. That something repeats is not to be taken as theoretically important because this patterning may occur by chance. In other words, patterning is just a sign of theoretical development, not the final judge of it. Categories are ways of making sense of the relation between things which are observable and, in that sense, categories refer to the non-observable realities such as causal connections or associations. Identifying patterns is a conceptual operation to the extent that they are seen not as empirical particulars which can be found in bits of data but as non-observable constructions through which empirical connections are identified. This means that even though a pattern may be unobservable, an implicit pattern may be still at work. Categories are good when they provide explanations of the empirical level and in that sense, categories do not reflect data but they have to explain them. This means that concepts are not to be identified with operational definitions but instead they have a theoretical framing through which the relation between category/properties/dimensions is established. This is a crucial point because causality is not at odds with GT, as may be believed if one identifies GT with Pragmatism and symbolic interactionism. The reason is that Glaser (to a large extent) and Strauss (to a lesser extent) left open the second and the third phase of theory development to various kinds of theoretical help, not only to these two epistemological traditions. Critical realism, for instance, provides powerful epistemological armor for concept formation, the most well-known of which being "relational mechanisms" and causal explanations (Author/s/et al., 2020). Although Glaser wan not a critical realist, he was more prone to using causality-related terminology, as the six Cs (causes, contexts, contingencies, consequences, covariances, conditions) indicate. According to this coding family, researchers attempt to theorize how causal processes connect conditions with outcomes. We argue that causal explanation fits in with GT's approach to theory development. This can be done by investigating causal connections between conditions, practices and consequences while a process is at work and by taking agents' strategies into account. In other words, categories tap causal connections concerning the phenomenon of interest and this is an operation carried out in the second and third phase of coding. Dey (2007, p. 177) suggests three visualizing devices for tapping how conditions, processes and consequences are causally connected. First, by means of tables one can explore what happens when the properties of one category (seen as conditions) interact with the properties of another category (seen as outcomes) (Table 1).

Table 1. Crosstabulation of causal conditions with outcomes

	Causal conditions	
	Value 1	Value 2
Outcome	[1]	[2]
Value 1	[3]	[4]
Value 2		

While 2X2 tables are typically used as a device for identifying cases in which causes and outcomes are present, which means that only one cell is the main focus, from a GT perspective all of the cells are compared in order to explore the "big picture" and to answer the question of how the core category explains the participants' main concern. For example, suppose that the category concerning causal conditions is "students' social network ties" and its properties are "connections obtained in university life" (value 1) and "family connections" (value 2) and the category concerning the outcome "strategies for searching for postgraduate studies" is related to the properties "desire to attend postgraduate studies abroad" (value 1) and "desire for postgraduate studies near home". Then, the researcher compares the incidents which correspond to each cell in order to theorize how "students' social network ties" and "strategies for searching for postgraduate studies" are causally connected through specific social processes. The same procedure can be followed if one uses the dimensions of the properties as values and then compares the intersections between them.

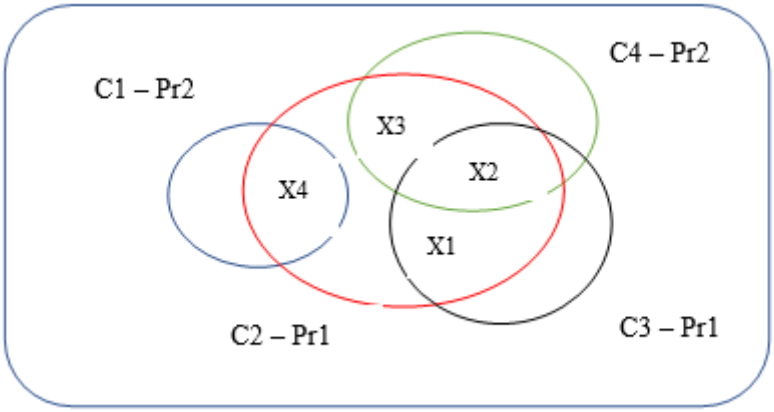
A second device suggested by Dey (2007, p. 179) for highlighting causal connections between conditions, interactions and consequences is causal maps in which intersections between categories and cases (contexts) are depicted (Table 2).

Table 2. Crosstabulation of categories with contexts

	Category 1	Category 2	Category 3
Context A	q	k	l,m
Context B	j	o	m,n,u
Context C	j	o	l,e

In order to tap causal connections, Dey suggests crossing categories with cases in order to assess the distribution and weight of evidence. According to this line of reasoning, categories are seen as a series of variables with values for each of the cases being analysed. However, since the point is to see what happens when two things meet each other (which is the outcome when categories and cases are intersected), one could make use of this graph in two alternative ways. First, researchers might examine what the value of the outcome is when the properties of the categories (not the categories per se) meet each of the contexts A, B, or C. Second, subscribing Dey's remark (2007, p. 180) that Glaser and Strauss did not think of their argument as a case-based methodology, we think that through this graph one can find answers to the question "the instantiations of what case do your propositions provide an

answer for?" because scope conditions concern cases being covered by a theoretical category. I mean that since the core category of a substantive theory is the category through which the close-to-evidence categories are connected, then by answering this question researchers may think of the contexts not as empirical events but as relational contexts with emergent properties which do things when specific conditions (see categories' properties) are met. This is a good way of avoiding inductivism that many a scholar has accused GT of. We will provide more details in the sections where we will present the example with the research material from the field of education. Finally, quite a few qualitative researchers acknowledge the usability of Venn diagrams for handling data (Soklaridis, 2009). Venn diagrams can be used either for identifying overlaps between the dimensions of one category or between the categories' properties. (Graph 3)



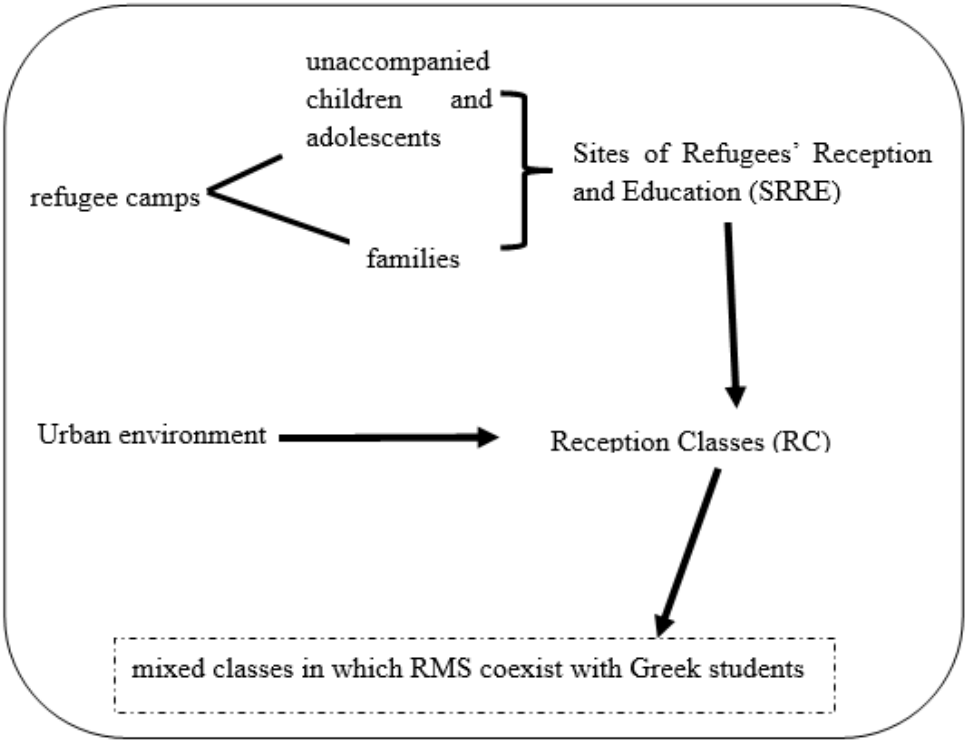
Graph 3. Venn diagram for identifying intersections between sets

For instance, in Graph 3 each colored circle depicts the set of the property of a category (C1-Pr2 the blue circle, C2 – Pr 1 the red, C3 – Pr 1 the black and C4 – Pr 2 the green) and the X1, X2, X3 might represent either outcomes or instances. In other words, X4 could represent either the outcome produced when set C1 – Pr2 meets (overlaps with) C2 – Pr 1 or provide examples from the interview material highlighting the overlap. Alternatively, the sets could be the dimensions of the properties and the X's could be contexts within which actors develop strategies. Once again, the reason for using Venn diagrams is to provide the researcher with a means for theorizing complex relations emerging from the data through comparison both within and across categories. In any case, the analyst is he who provides the readers with a narrative explanation through which a theoretical interpretation or explanation (substantive theory) of a delimited problem in a particular area is developed, such as teachers' identity, handling intervening parents or "disobedient" pupils. As Dey puts it (2007, p. 184), explaining in a narrative way means connecting chance events, unplanned encounters, unexpected incidents and unanticipated consequences in an intelligible way. "Causal chain" is another term for making sense of what narrative explanations are striving to do. From this perspective, the parts of the story are explained as a whole and the explanations are evaluated according to their "grab" or "fit", that is how much they "fit" with the setting from which

they have been derived and enhance the practice and understanding of the participants. In the following sections we endeavour to clarify the abovementioned methodological reasoning by showing how we implemented it with research material collected from a research project on multicultural education.

6. Categories, Properties, Dimensions. An Example From Intercultural Education

Before I proceed to the analysis, let us say a few things about the research procedure and about how migrant students are treated in the Greek educational context. Starting from the latter, educational policy in Greece channels refugee and migrant students (RMS) into educational settings by means of the routes as they are depicted in the following graph (Graph 4).



Graph 4. The educational path for the inclusion of refugee and migrant students in the Greek educational system

Refugee students who live in refugee camps and are either unaccompanied or live with their families take part in SRRE which act as preparatory contexts so that students may be included in mixed classes through their passage to reception classes (RC). RC are classes which are created ad hoc in schools whenever RMS are willing to attend elementary or secondary school. RC are part of the Educational Priority Zones, an educational policy enacted in Greece as means of combatting social exclusion from school life. Migrant students who live in the urban environment may take part in RC without participating in SRRE. RC are created ad hoc according to whether there are RMS who are willing to be registered at a

school and they are grouped according either to RMS' age level or to their level of knowledge of the Greek language. Note that RMS and mixed classes are not separate stages but act in an overlapping way in so far as RMS attend both of them during the school day. The research question concerned how teachers dealt with mixed multicultural classes, what teaching methodologies they implemented and how they managed to bring refugee and migrant students (RMS)' tacit cultural knowledge into contact with official school knowledge. Data were collected through 30 semi-structured interviews with teachers who work in RC and in (primary and secondary school) classes where RMS are mixed with Greek students. It is an explorative question in the sense that in the literature there are no substantive theoretical explanations for the phenomenon of interest. Note that in qualitative research the phenomenon is not something one knows beforehand but it is clarified during the analytic process and when the core category has been identified. We followed the rule of "not reading the topic literature" before data analysis had started not because of anti-scholarship intentions but because it is a condition for discovery, as Glaser argues (1998, p. 69). Otherwise, the former claim (late specification of the phenomenon) would contradict the latter (theory development) because it is possible that involvement in the literature may make the researcher believe that he knows what he is going to discover (while the opposite should be the case). However, this dictum is followed until the end of the in vivo (initial) coding because in the following two stages of coding theory development does not arise in a purely inductive manner but rather the researcher's theoretical sensitivity is at work (Thornberg, 2012). Thus, initially we started coding in vivo the transcribed pages (nearly 350 pages in total) without posing the questions "what category does this incident indicate?" or "what property of what category does this incident indicate?". However, during this initial phase of coding we hand in mind to explore what the participants' main concern is, what is going on in this specific substantive area (teachers who teach in classes composed of native Greek and RMS). Thus, gradually and while we were coding in vivo, the problems and the difficulties both teachers and students faced and the actions these two groups implemented for overcoming them emerged as initial categories. In particular, they concerned the barriers refugee and migrant students faced before and upon their entrance to the school setting, obstacles related to how migrant educational policies were enacted in schools, what teaching methods teachers put in action for dealing with multicultural classes and how school principals managed all these problems. In order to impose some order on the "mess" of the in vivo coding and the data bits related to all these initial codes, we made matrices (by taking into account the above questions) in which we show how we moved from the elaborations we made from the first reading of all the codes to their final refinement. For instance, in Table 3 in which we show the construction of category 1 (language barriers), C1a refers to the elaborated property of cells 1 and 3, C1b refers to the elaborated property of cell 2 and C1c refers to the elaborated property of cell 3. Finally, "not at all / to a large extent" measures the range of values that the properties take.

Table 3. Category 1 – language barriers

CATEGORY	PROPERTIES (initial)	PROPERTIES (final)	DIMENSIONS
C1 **Language barriers**	incorporation is a problem because refugees and migrant students do not speak Greek [**cell 1**]	emotional withdrawal **C1a**	Not at all / to a large extent
	students from post-communist Eastern Europe have huge difficulties in writing and have no school experiences [**cell 2**]	difficulties in writing in Greek and no school experiences **C1b**	Not at all / to a large extent
	Not speaking Greek is an embarrassing experience, students from African countries spoke in English while a translator for students from post-communist Eastern Europe was present [**cell 3**]	Not speaking English **C1c**	Not at all / to a large extent

In a similar way, Tables 4 and 5 depict the categories “social barriers” and “cultural barriers” respectively.

Table 4. category 2 – Social barriers

CATEGORY	PROPERTIES (initial)	PROPERTIES (final)	DIMENSIONS
C2	Conflicts among unaccompanied refugee students which started at their camps	Conflicts among unaccompanied refugee students **C2a** They do not aspire to stay long in Greece **C2a’** do not want to learn to speak Greek **C2a’’**	Not at all / to a large extent
	Unaccompanied refugee students do not aspire to stay long in Greece and do not want to learn speak Greek		
	The jobs of RMS’ parents do not allow them to visit schools	The jobs of RMS’ parents create difficulties	Not at all / to a large extent

Social barriers	Some of them are helped in translation by relatives	**C2b** Some of them are helped in translation by relatives **C2b'**	Not at all / to a large extent
	Parents of Arab students seem too reserved	Reservations towards school **C2c**	Not at all / to a large extent
	Parents of students from post-communist Eastern European countries want their children to follow their parents' paths (become manual workers and start a family)	Instrumental relation with school **C2d**	Not at all / to a large extent

Table 5. Category 3 – cultural barriers

CATEGORY	PROPERTIES (initial)	PROPERTIES (final)	DIMENSIONS
C3 **Cultural barriers**	No cultural of punctuality	Arab students develop alternative temporal cultures (no punctuality) **C3a**	Likert scale
	Religion is more important than science	Prioritization of religion **C3b**	Likert scale
	Cultural shock (no supermarket, no lights in the roads)	Cultural shock **C3c**	Likert scale
	Arab students "are not in a hurry", they have slow rhythms		

A close reading of the tables shows that the initial version of the column of properties contains the in vivo coding as it emerged from teachers' perspectives and wordings while in the final version of the column of properties, we tried to condense the in vivo codes without losing their first-hand construction. In addition, besides condensing, we tried to avoid the overlapping between properties (for example, between C2a and C2b) and to refine them in cases where first-order constructs of the initial version entailed subtle differences within the same property (for example between C2a' and C2a'') which had to be kept discrete. While Tables 3, 4 and 5 concern the language, social and cultural barriers RMS face, Table 6 depicts barriers related to the teachers' social role and practices.

Table 6. category 4 – educational barriers

CATEGORY	SUB-CATEGORIES	PROPERTIES (initial)	PROPERTIES (final)	DIMENSIONS
C4 **Educational barriers**	Barriers related to teachers	Disputes among teachers Teachers' unwillingness to accept RMS into their school or into their class	Teachers' stereotypes **C4a**	Not at all / to a large extent
			Classification system **C4b**	According to knowledge level/all together
				binary
	Barriers related to organizational and bureaucratic management of RMS	Classification system of RMS Speaking the language Curriculums in RC and mixed classes are the same as C for general population RMS enter RC and mixed classes any time	Cimilar curriculums **C4c** RMS outnumber Greek students in RC and mixed classes **C4d**	Not at all / to a large extent

In vivo coding brought to light two sub-categories of the "educational barriers" category which had to do a) with teachers' unwillingness to get involved with RMS or with disputes among teachers due to the unwillingness to accept them in their classes and b) with the unpreparedness of schools to deal with RMS at the organizational and bureaucratic level. Differentiating between categories and sub-categories is not a technical issue but deserves special methodological attention. The question is what is the criterion or the reason for splitting the category into two or more subcategories instead of fragmenting it directly into its aspects or its properties? My line of reasoning is that sub-categories differ regarding how the components of the category are enacted. While properties refer to the various aspects or contexts through which (sub)categories are enacted and are observable, sub-categories need to be constructed when categories entail unobservable components whose level of abstraction has to be kept at a theoretical level before they come to be specified as properties. As far as the "educational barriers" category is concerned, the fact that quite a few teachers are unwilling to get involved with RMS deserves discrete theoretical treatment in comparison with the bureaucratic inadequacies of how the education policy regarding RMS is implemented in schools. However, the common base of these two sub-categories of barriers is that both of them end up impeding RMS' inclusion in school life. Finally, Table 7 shows the classification of the various teaching methods teachers used for handling multicultural classes.

Table 7. Category 5 – Handling multicultural classes

CATEGORY	PROPERTIES	DIMENSIONS
C5 Teaching methods used for handling multicultural classes	Specialty resources	Human sciences/"Positive" sciences
	Individualized learning	Not at all / to a large extent
	Use of English language	Not at all / to a large extent
	RMS act as translators	Not at all / to a large extent

The category "teaching methods used for handling multicultural classes" is composed of four properties one of which (specialty resources) corresponds to the bipolar dimension "human/positive sciences". In particular, the teachers' specialty is a resource for choosing teaching practices like discussing universal values such as friendship or respect (philology teachers) or theatre plays or how humans exchange goods (science teachers). The aim of these practices is to transcend the particularities related to the perspectives of the various ethno-cultural origins. Other teaching methods concern learning according to the age level or to other particularities of students, the use of English language and the intervention of RMS students who speak English and act as translators between the teacher and the student. Let me summarize the first phase of GT coding. As we noted in the beginning, the aim of the coding in the initial or open phase is not just to label in vivo bits of data but to construct the main categories as they emerge from in vivo coding according to the dimensionalizing approach of concept formation. Category, properties and dimensions are three different methodological tools for tapping the complexity and variety of the phenomenon of interest as it is enacted in a particular case. This complexity and variety is depicted in the conceptual categories researchers craft each of which taps specific aspects of the reality being studied. In our analysis of the material, the five conceptual categories which emerged were social barriers, cultural barriers, language barriers, educational barriers and teaching methods. Beyond the difference that properties cannot stand by themselves while categories can, note that properties refer to external relationships and specify how an entity acts or interacts with its environment. Finally, dimensions tap the range of empirical differentiations through (or across) which these actions occur (Dey, 1999, p. 54). The most intriguing phase of coding (the selective or axial coding in GT terminology) starts after the conceptual categories have been constructed because in the second phase of coding what is at stake is to highlight connections between them through coding families. In the next section we show how we proceed to make explicit connections between categories.

7. Linking Categories and Making Abstractions

While in the first phase of coding it is the actors' constructs which prevail in the analytic procedure of the handling of the material, in the selective phase of coding it is the researcher who has to bring to light how things are related and are connected. In that sense linking categories is a non-observable (and third-person) procedure which is necessary so that things can be explained. However, in order to avoid the temptation to jump straight into abstractions unrelated to the conceptual categories, linking and connecting may be facilitated through the use of the matrices or other devices like those we discussed in the previous section. In our

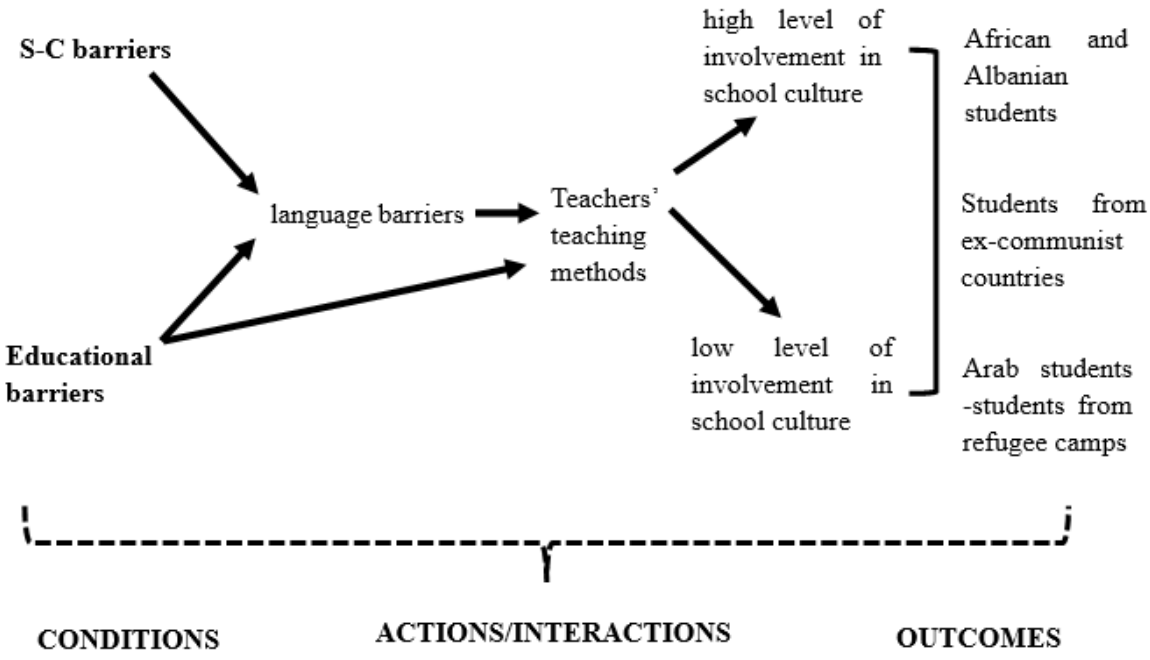
research, we created a cross-tabulated matrix in which we try to make explicit the connections between the properties of three of the five conceptual categories that emerged from the initial coding and the five ethno-cultural groups of RMS students. By taking the data into account, we thought that these three barriers are related in various ways with the five ethno-cultural sub-groups and cross-tabulation can depict them in a systematic manner.

Table 8. Crosstabulation of "barrier types" with RMS' ethno-cultural origin

	Types of barriers												
	Language barriers			**Social barriers**							**Cultural barriers**		
	C1 a	**C1 b**	**C1a c**	**C2 a**	**C2a'**	**C2a''**	**C2 b**	**C2 b'**	**C 2c**	**C2 d**	**C3 a**	**C3 b**	**C3 c**
Arab students	5	5	1	1	1	1	3	4	5	3	5	5	5
Students from ex-communist countries	4	2	2	1	1	1	4	4	1	4	1	1	2
Students from refugee camps	5	5	5	5	5	5	5	5	5	5	5	5	5
African students	1	1	1	1	1	1	4	1	1	1	1	4	4
Albanian students	1	1	5	1	1	1	4	1	1	1	1	2	4

Note that the five ethno-cultural groups of RMS students were selected by the researcher in order to highlight the different social conditions within which each of the categories' properties made sense. In other words, the coding at this stage is axial or selective because we have selected the axes of barriers and the various ethno-cultural groups in order to bring to light connections between them. As Glaser notes (1998, p.123), the function of axial coding is not to fragment the data even further but to act as an intermediary step for theory integration. Within the cells we have inserted the dimensions of each property measured from 1 (not at all) to 5 (to a large extent). For example, not speaking Greek (C1a) leads Arab students to a large extent to emotional withdrawal and Albanian students seem to not favor religion over school knowledge (C3a). This is a conceptually ordered display which summarizes in a cross-case manner how many cases share similar characteristics (for example see the common dimensional level and the properties shared by the Arab students). In that sense, "cases" are not identical to informants but they have emerged through a close reading of the categories C1, C2 and C3 which not only tap the variety of barriers but affect in various (dissimilar) ways the various ethno-cultural groups of RMS. The aim of this case – ordered table is to explore possible connections according to a variable (here, the axis «barriers») of interest selected by the researcher. In our research this kind of display proved to be extremely powerful because we managed to discern conditions from outcomes. One should not consider this as a terminology unrelated to GT's premises because it was Strauss and Corbin (1998, p. 127) who underlined that if one studies conditions or structures, then (s)he learns why something happens. What is more striking is that conditions, for Strauss and Corbin, should not be conceived of as a mere cause-and-effect line of reasoning but that conditions bring to light what happens when various causal factors operate in various

combinations and create contexts. In addition, conditions and outcomes are connected though processes which in the terminology of GT concern actions/interactions. In other words, in GT' methodology there is plenty of room left for the researcher to forge causal explanations which identify how social phenomena are produced. Table 8 is a visual device for this aim in so far as it shows the extent to which each kind of barrier affects each ethno-cultural group. It was by means of this table that we started experimenting with various diagrammatic representations in which the main explanatory idea could be depicted and the substantive theorizing take shape. After many an attempt we arrived at the following graph (Graph 5).



Graph 5. Depiction of how the core category covers axial coding' s categories

One of the features of substantive theorizing is that at this stage of coding researchers integrate the way categories have been connected in the previous stages of coding under a conceptual explanatory statement. The concepts' level of abstraction, as Strauss & Corbin put it (1998, p. 143), does not refer to each individual's or group's story but capture groups' and persons' representations as a whole. In addition, concepts are stated in relational terms, which means that they are used to explain what is going on (or the main concern, in Glaser's terms) in the substantive field. The most difficult thing in this stage is the explicit and clear delimitation of the core category which condenses in a few words "what this research is all about". For Glaser (1998, p. 139), the core category is the product of theoretical coding which, by connecting all the substantive codes, enables researchers to see "the big picture" by conceptualizing what is going on. As Strauss & Corbin argue (1998, p. 147), the core category has the analytic power to pull all the other categories together to form an explanatory whole. Although easy to say, this is hard to put into practice. Reflecting on the systematized and disciplined analytic process of passing from observational data to theory development, Wasserman, Clair and Wilson (2009) made use of the fractal generator as an

intermediate step for this goal. By following their footsteps, we tried to transform the information obtained from Table 8 which depicts selective coding into a theoretical argument which taps the variation of this table using diagrams. The diagram in Graph 5 enabled us to conclude that the core category of our research might be "unplanned and diversified inclusion". We argue that the appropriateness of the core category lies in the fact that it captures conditions, actions/interactions and outcomes. In particular, socio-cultural and educational barriers concern how these two interrelated factors are combined as a context affecting language barriers. Note the two arrows start from educational barriers, one of which goes to language barriers and the other goes to how teachers handle RC and mixed classes. The first concerns how teachers' unwillingness (and sometimes stereotypes) prevents them from becoming involved with RC and mixed classes and the other is related to the organizational inadequacies which make these classes dysfunctional. We thought that socio-cultural and educational barriers act as conditions which precede language barriers which, in turn, precede how teachers handle RC and mixed classes. In other words, how teachers handle language barriers in RC and mixed classes represent actions/interactions or how they deal with these conditions. The outcome or the consequence of this process is that RMS' level of involvement in school culture varies by ethno-cultural origin. That is why the phenomenon we researched concerned a kind of inclusion which is diversified. The "unplanned-ness" of the core category has to do with the fact that most teachers implement intuitive teaching methods for dealing with RC and mixed classes which is based solely on their scientific habitus and not on a clearly stated multicultural teaching methodology. Rephrasing Archer, we could say that the case of intercultural education instantiates the gap between system integration and social integration. While system integration denotes the visible and official aspect of what institutions do for the inclusion of vulnerable groups, social integration refers to the various shortcomings and dysfunctions (due either to organizational processes or to collective practices of resistance) through which a non-intended consequence arises, usually social exclusion. In our research something similar takes place to the extent that RC and mixed classes represent the system integration aspect of multicultural educational policy while in practice it seems that a variety of barriers deprive specific ethnocultural groups of RMS of the opportunity to get involved with the official school knowledge. Be that as it may, we proposed "unplanned and diversified inclusion" as the theoretical code which conceptualizes a substantive area of research and integrate the various substantive categories (C1-C5) into an explanatory whole.

8. Conclusion

In this article we tried to show how one could practice substantive theorizing according to the principles of GT. In order to avoid a theme-like reconstruction of substantive theorizing, we argued that the analysis has to emphasize a) how the categories have been dimensionalized, b) the importance of matrices that highlight explicit connections between properties or dimensions along a specific axis and c) the ways through which these connections can be theorized by means of a core category. The use of the case – ordered table (see Table 8) proved highly crucial for highlighting these connections and for performing at once reduction and integration, that is for the identification of the core concepts on which substantive theorizing rests (Richardson & Kramer, 2006, p. 506). Similar attempts of constructing visual

representations have been made by Ligita et al. (2022, p. 128) who use concept mapping to facilitate the analytical process of theory generation and by Buckley and Waring (2013) who note that diagrams facilitate the analysis of the data and are influenced by the researcher's epistemological position and interpretation of grounded theory. Our source of inspiration has been mostly Strauss (1987), Strauss and Corbin (1990) and Glaser's (1978, 1998) versions of GT because we think that Charmaz's (2014) constructivist suggestions cannot be easily reconciled with the more realist orientations of coding as they have been stated in Glaser (to a large extent) and Strauss (to a lesser extent). In practice this means that when we started thinking about writing this article and about substantive theorizing, we had in mind the creation of theoretical ideas in a level of abstraction higher than mere description and which (theoretical ideas) could tap the complexity and the variation of the phenomenon of interest (Apramian et al., 2017, pp. 363-4). However, we retained one of the basic tenets of Charmaz's version according to which GT coding is grounded both on data while being informed by existing research literature and theoretical frameworks (Apramian et al., 2017, p. 371; Thornberg, 2012, p. 248). In the example we have presented, this means that the process from codes to core category is neither linear nor a step-by-step procedure. There were hundreds of occasions on which we had to return to data bits in order to be assured about the range of the properties or about the boundaries of the categories. In addition, the core category we forged reflects the fact that the move from connecting to abstraction has been informed by the coding family from Archer's (1996) discussion on the role of actions/interactions in social integration. We tried hard to avoid conceptual description rather than explaining the causal narrative which covers the interplay of socio-cultural, language and educational barriers for the integration of RMS to school life. In that sense, the researcher's reflexivity contributed a lot to the final core category we forged. However, as Glaser (1998, p. 116) argues "the world exists and it will not go away if it doesn't go your way. So, for those using GT let's find out what's going on in the substantive area of research". In that sense, we tried to stay close to the participants' main concern and to provide a causal narrative explaining how they try to resolve it.

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