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**Combining qualitative, quantitative and structural dimensions
in a longitudinal perspective.
The case of network influence.**

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Abstract:

Some research questions involve several dimensions. The most rewarding approach may be switching (under control) between the diverse methods and databases involved. Having recourse to different dimensions that form a system produces wider results but also opens up new questions. A survey on the evolutions of social networks and life transitions of young people draws an original design including contextual names generators, questionnaires and interviews in a longitudinal perspective. Young people interviewed every 3 years on 4 survey waves produced a total of 287 interviews and networks and a global amount of 10804 relationships informed. This paper aims to highlight this specific potential of integrating qualitative, quantitative and structural dimensions in an iterative process of data construction and analysis. The methodological argument is empirically illustrated with a focus on the thematic of influence of the network upon life orientations. It shows influence comes mainly from strong central ties but also from some peripheral isolated mates. The structural evolution reveals a general trend of dissociation of their ties the ones from the others when people are entering adult life, which makes influence from the network become more and more diversified.

Keywords: Mixed methods, social networks, longitudinal survey, dynamic perspective, influence

1. Introduction: mixing methods and new perspectives

Mixed methods designs allow consideration of an object from several points of view and in several dimensions. They generally combine qualitative and quantitative methods in order to articulate, sequentially or simultaneously, positivist and constructivist paradigms (Tashakkori and Teddlie, 1998). This plurality of perspectives allows better understanding human and social questions and interpreting complex phenomena (Newman and Benz, 1998; Tashakkori and Teddlie, 2010). More over, mixed methods open up new opportunities. Not only do they add classic methods the one to the other, but their mixing also initiates new perspectives and new paths (Sale, Lohfeld and Brazil, 2002). This is the case especially when a multimethod approach involves the whole research design, from formulating the research question, precisising the objects to study and collecting the data to analysing and reporting the results (Brewer and Hunter, 1989). Such an integrative and inclusive framework opens new areas and better fits with the research process.

This paper aims to highlight this specific potential of integrating qualitative, quantitative and structural dimensions in an iterative process of data construction and analysis. It is elaborated in order to give very precise and didactic illustrations of the problems and methodological responses raising from the combination of diverse dimensions in the research process. The analysis is based upon a complex survey design which combines a multidimensional research question, parallel objective and subjective data collection, multilevel use of qualitative and quantitative methods, sequential analysis of interviews and statistics, structural dimension given by social network analysis, and longitudinal perspective enabled by a follow-up survey through which people are repeatedly interviewed.

1.1 Interfaces and combinations

The research topic combines two paradigms: biographical processes and personal networks dynamics. Indeed, the research question is located at the interface of dimensions of social life that are generally dissociated in the social sciences, namely socialization processes and modes of sociability. The research question is: How do young people become adults, and how are their personal networks involved in this process? This original perspective encourages combining various methods of investigation, data processing and multilevel analysis. Qualitative methods will on the one hand provide a better understanding of the logics of life transitions and the forms of relational influences, while quantitative methods will on the other hand enable comparisons of personal characteristics and relational features. Social network analysis postulates the relevance of the position in the network and the characteristics of the ties in influencing social behaviour. Social network analysis articulates diverse dimensions: the individuals, the relationships and the global structure of the system (who is connected with whom, by which kind of tie and in which configuration?) (Wasserman and Faust, 1994; Wellman and Berkowitz, 1988). Comprehensive social network analysis combines itself both quantitative measures and qualitative understanding of the network configuration, but it cannot be reduced to this combination (White, 1992; Emirbayer and Goodwin, 1994; Fuhse and Mützel, 2011). Structural analysis adds original information and must be considered as another dimension. Indeed, structural methods allow measurement of diversity and cohesiveness of the influences on young people through their personal network. Finally, longitudinal analysis articulates diverse moments, sequences and processes of evolution of both biography and network. But above all, the very process of switching from one method to another reveals how these dimensions interact and how questions are progressively constructed through these interactions.

The research presented here combines qualitative, quantitative and structural longitudinal methods, focusing on social contexts as well as life trajectories, relational histories and

configurations of personal networks, as young people evolve in the course of the transitions towards adult life (Bidart, Degenne, Grossetti, 2011). The aim of this article is to highlight the way mixed methods may improve a systemic and synergistic research process (Maxwell and Loomis, 2003, Hall and Howard, 2008). Beyond the presentation of the design of the survey, our objective is to highlight an example of a specific integration of methods and to reveal how the complementary dimensions intersect. It also shows the originality of results obtained by such iterative and pluridimensional framework.

1.2 The research question and hypothesis: how sociability is linked to socialization

When young people are experiencing the transitions into adult life, their modes of sociability are changing radically, reflecting mutations in relationships to the social world. Studies of socialization that approach the question of these biographical changes and transitions, even when they mention the influence of 'significant others' (Mead, 1967; Dubar, 1991), do limit the latter to parents or to role-relationships. They neither examine systematically these relationships specifically, nor consider individuals' social network as a complex influential system. Nevertheless, an individual's relational environment can only be rigorously constructed through analysis of social networks.

The idea that there is a close link between socialization and sociability arises directly out of the combination of two hypothesis: firstly, socialization processes are supported and guided by the examples given by members of personal networks and the incentives they offer: one does not grow up by oneself. Secondly, relational networks are constructed as young people move and anchor themselves in the social world and these networks evolve according to biographical issues. Consequently, our approach establishes links between two paradigms: biographical analysis and analysis of personal networks. Each network includes the people with whom the respondent has relationships, the nature of those relationships and the interconnections between these network members. The construction and evolution of this relational system is a key element in this approach, leading to the setting up of a panel-based longitudinal survey.

2. The Survey design: time, stories, calendars and networks

Biographical research has traditionally used mixed methods, but longitudinal methods have been more recently developed. Our research question implies a dynamic perspective, asking: How are personal network evolutions involved in biographical transitions and process? In order to explore it in a real dynamic dimension, a longitudinal survey (see appendix) was designed. This required repeated interviews of the same people at different moments of their lives. Such a protocol took into account the fact that time matters in social processes (Abbott, 2001). It combined the study of changes in objective and subjective data and in interfaces between biographical and relational evolutions, while young people were entering adult life. A survey population of 87 young people were selected on a voluntary basis from diverse schools and educational programs situated in the town of Caen, France. The sampling criterions were gender and the course of study. The young people were in the senior year of general high school or vocational high school or were on integration programmes; each group contained more or less even numbers of boys and girls. At that time, they were aged between 17 and 23. They have been re-interrogated every 3 years during 9 years, along 4 successive survey waves.

2.1 Biographical histories: qualitative objectivized and subjective data

The life trajectories of this cohort of young people were investigated qualitatively. The numbers involved (from 87 in wave 1 to 60 in wave 4) meant that the survey population did not

lend itself well to statistical analysis on the basis of this individual biographical dimension alone. Consequently, the initial concept of this survey design was that it should be comprehensive and focus on comparison of the various waves of the survey in order to gain insights into the socialization processes and development of personal networks over time. Two types of data were combined in this approach: 'objective' data and subjective data.

While the data can hardly be described as genuinely objective, since it was the young people themselves who provided the accounts of their trajectories, it was nevertheless possible to get close to objectivizing their situations and their progression. This was done particularly through the use of standardised questionnaires and monthly biographical calendars detailing retrospectively the three past years since the former survey wave, recording situations, events, facts and networks. This took place in the first part of the interviews. Then the researcher went to his office and prepared the comparisons with the data coming from the former survey wave 3 years before. He came back for the second part of the interview, in which the respondents were asked more open-ended questions and allowed to speak more freely. The data collected were then more subjective, relating more about how these situations had been experienced and interpreted and decisions made. The respondents explained the changes that had occurred in their lives and in their personal relationships.

The aim of this procedure was to set the objective data gathered by the researchers alongside the young people's subjective assessments of the situation. It relies on the assumption that these two dimensions influence each other, in both directions: the objective reality of the events and their conjunction influence the subjective assessments and meanings, while individual representations and values influence the decisions that are taken and ultimately produce the objective trajectories (Giddens, 1984, Strauss, 1997).

2.2 Relational environments: from contexts to networks

The research questions and hypothesis led the researchers to develop a specific design for the social networks that was sufficiently broadly based to reflect all of an individual's social affiliations in all of the contexts he lived through in the past or present days. The design could not, indeed, be restricted to representations of the central core of people closest to the respondents, of those providing most social support or of those most frequently encountered, since that would have given a very limited and fragmented picture of their socialization. In order to construct networks that were as faithful as possible to the range of the young persons' social affiliations, an original method of gathering the names of the individuals they knew in all the possible environments, known specifically as a 'contextual name generator' (Bidart, Charbonneau, 2011), was developed. The aim was to draw up the most possibly exhaustive list of people known by each respondent. The method proceeded by listing all the possible contexts that may provide relationships in young peoples' lives (school, job, leisure, and so on). Each network consisted of the first star of persons (called "Alters") named by the respondent (called "Ego"), completed with the connections between these Alters, as identified by Ego. The networks of the respondents were therefore completely separated ones from another, as none of these young people interviewed knew the others participants.

The density of each network, that is the degree of connection between its members, was also collected in the interview (which Alter frequent which Alter, as perceived by Ego), and was the starting point for the structural analysis of the network. In the standardized part of the interview, we requested for each Alter named by Ego a certain amount of sociographic information (age, employment situation, marital status, level of education, and so on), as well as information about factors likely to affect the relationships between Ego and Alter (age of children, geographical proximity to Ego, duration of their tie). Information was also gathered

about the quality of the relationship (shared activities, frequency of contact, relational intensity, forces driving the relationship).

3 Dimensions and databases

3.1 Populations and kinds of data

When all the Alters of all the young people interviewed were included, the population consisted of 7096 individuals, each with their own attributes. Defining this population as the total number of members of the different personal networks of young people who left high school or labour market integration programmes in 1995 in Caen in Normandy was justifiable from a sociological point of view. This makes it possible to carry out statistical analyses on this data set, primarily with the aim of measuring changes over time, particularly in terms of composition with regard to certain significant variables. Thus it can be ascertained whether this population size had grown or reduced, was more or less homogeneous, more or less localized, and so on. The statistical value of this research lies in the fact that, compared with the Ego population, the Alter population generated in the construction of their respective networks was large enough to be analysed quantitatively on several levels, as described in detail.

Following this first part of the interview, in which the respondent's contexts, relationships and life events were described and noted on questionnaires and forms, the researchers compared them with data from the previous wave that had been conducted three years earlier. They identified the changes that had taken place in the situations of the Alters and in the characteristics of the relationships. They also compared the list of cited names and the network with the previous ones. Then a second appointment was organized with the respondent, for semi-structured interview, in order to take full advantage of qualitative methods. The aim was to explore the rationales animating the articulation of events and relationships from a dynamic perspective. A series of questions were explored, including: Why did young people see some relatives more than others? Why had some friends dropped out of sight and not others? How did respondents meet new colleagues? At what point and after what experiences did they consider people to be 'real friends'?, and so on. Their answers were explored in order to gain insights into the relational and biographical dynamics at work, and the linkages between them.

3.2 The complexity of the temporal dimension

These young people had progressed in their lives over time. Some of their attributes remained unchanged (sex, social origin, date and place of birth); most of the other attributes had changed over time, either in a linear way (as with age), or in a less linear, even reversible way (changes in employment situation, marital status, address for example). Moreover, certain unforeseen events, not part of the regular 'life cycle', might have disrupted their trajectories (unemployment, migration, accidents and so on). Young people's lives are, after all, characterised by a very dense, highly concentrated and intertwining series of changes (Bidart, 2006, Furlong and Cartmel, 2007, Leccardi and Ruspini, 2006).

Thus the longitudinal perspective required us to specify, for each element of our Ego population, the point in time we were referring to. Consequently, identification of an Ego had to be supplemented by details of the survey wave and thus, situated in time. For example, in the case of Sidonie, one of the young respondents, we indicated whether we were referring to wave 1, 2, 3 or 4 (since she was no longer the same age and might have left education, got married, moved house, and so on). Then the Ego database was complemented by a temporal dimension, what we decided to call "EgoTempo".

Of course, all these transitions could possibly have affected the Alters population. For example, Sidonie's best friend, Elise, had also grown older and had experienced changes in her situation and important events. The Alter population also required temporal indexation, what we called "AlterTempo". This population reached 10804 "Alter at a moment". For example, an Alter who was cited in the 4 waves of the survey represented one observation in the Alter-database, and 4 observations in the AlterTempo-database.

Both the respondent (Ego) and the Alters he/she named went through certain periods that were more marked by changes than others. Above all, the similarity between Ego and Alter, which is generally very important in shaping relationships, might have changed. For example, when leaving school, Sidonie might have found a job, left her parents' house, got married and had a baby. If her friend Elise, for her part, had gone to university, she might have continued to live with her parents without working for a few more years. Thus the gap between some characteristics of Ego and Alter might have widened, whereas they were in the same situation at the time of the first wave of the survey. Their degree of similarity would no longer be the same. Consequently, the similarity between Ego and Alter had to be regarded as unstable and needs to specify in which wave of the survey it is being set. Our analysis will be located now on three different levels: the evolution of Ego, the evolution of Alter and the evolution of their similarity.

Moreover, the relationship itself may have evolved. Alter may even have disappeared from Ego's network. If he or she still features, then the strength of the tie may have changed, or the frequency of contacts, or the nature of exchanges between them, or the involvement in group activities may also have changed over time. All these informations were recorded during the interviews.

3.3 The complete database of dyads in time

Thus the analysis was framed in terms of relationships, focusing on Ego, Alter, their relative situations and the characteristics of the ties between them at the time of each survey wave. To that end, a 'triplet' consisting of Ego-Alter-survey wave is formed (e.g. Sidonie-Elise-1998). Each triplet is considered as a new observation, and all these relationships are dealt with as one population. We called this database "DyadTempo". Of course, some individuals in this population (either in the flesh or in their name) were the same, but three years afterwards they were not in fact absolutely the same, either in themselves or with regard to the relationship. In 2001, Sidonie was married and a mother, while Elise was neither. Their relationship had developed from a simple school acquaintanceship to a very profound friendship and the quality of the tie between them had changed. This survey population, made up of the 'triplets' i.e. the dyadic relationships at the time of all the survey waves, totals 10804 observations, which also provided a solid quantitative base for comparing relationships over time.

Table 1: Databases from the "Social networks and social integration Panel "

base	size	units	data
Ego	87	Persons surveyed (Ego)	Stable attributes of Ego
EgoTempo	287	Persons surveyed at a moment (87+74+66+60)	Interviews Narratives of Ego's changes
Alter	7096	Persons cited (Alter)	Stable attributes of Alter
AlterTempo	10804	Persons cited at a moment	Narratives of Alter's changes
DyadTempo	10804	Dyads Ego-Alter and their relationship at a moment	Dyads, similarities Ego/Alter Stories of relationships
NetworkTempo	287	Ego-centered relational system at a moment	Networks (Ego, his first star of Alters and the interconnections between them)

3.4 The personal network as an evolving structured system of ties

Finally, the actual configurations of the networks evolved: ties were created and broken, linked together and separated. Each respondent had a different network at each wave of the survey. Thus the system consisting of the Alters mentioned by Sidonie at each wave of the survey, the characteristics of their relationships to her and the interconnections between her Alters had undergone changes that were evaluated (Feld, Sutor, Gartner Hoegh, 2007). The global structure of the interconnections in each network was examined, as well as the position of each Alter. There were as many networks as observations in EgoTempo database.

4 Mixed methods and the creation of dimensions

4.1 Databases and methods

The use of mixed methods applied to complex and longitudinal data required a rigorous approach. Indeed, various types of data were available and distributed among different databases. Consequently, it was essential to know which database was in use at any one time. The nature of our materials is summarized below:

In the interviews that constituted the EgoTempo-database, we stored objective factual data concerning Ego's situation as well as subjective qualitative data on transitions and explanations of changes and life choices. For each Ego at one time, there was also a network made up of all his or her Alters and their interconnections.

The Alter-database contained factual data on a population that was subjected to statistical processing. We also had qualitative data on Alter's characteristics and on the state of their relationship as perceived by Ego. The AlterTempo-database distinguished those characteristics over time.

In the DyadicTempo-database, we had factual data on a 'dated' population of dyads and their relationships, which was also subjected to quantitative processing. However, we also had qualitative data as narratives and interpretations about the changes of certain relationships, the emergence of new ties, the vanishing of lost ties. For example, respondents were asked to compare the new and old ties, to explain why some Alters were "lost" and others remained, to identify the changes concerning their relationships in terms of resource provision, affective exchanges, influence, and so on.

In the NetworkTempo-database, we stored structural data describing the relational system constituted by one Ego, the set of his/her Alters, the quality of their relationships and the interconnections between the Alters. Various indicators describing and qualifying this network as a system can be used (the density of ties for example).

Each of these databases constituted a specific population, some of which were more suited than others to processing by quantitative, qualitative or structural methods. Some methods were better suited to certain populations and certain objectives. For example, quantitative methods would be preferred in order to measure frequencies in populations of sufficient size. On the other hand, in order to explain the reasons for particular life choices in small populations, qualitative methods would be preferred. Structural methods would be better suited to assessing group cohesion.

4.2 Adding, switching or combining: the creation of new perspectives

However, we do not switch between qualitative, quantitative and structural methods in order to test their explanatory power or to string together sequences of data produced in successive, completely separate stages. It is the combination of methods, rather than their mere accumulation, that produces additional value. After all, this mixing of methods allowed for new analytical dimensions that would not have been developed with just a single method. Thus the aim was to apply these different methods to the relevant populations in order to observe our object in its various dimensions. These dimensions are more than mere additional facets of or a means of shedding extra light on the object. Each method in fact brings with it a particular dimension; or rather it creates that dimension, which previously was only potentially present. For example, a point observed as it moves forward becomes a line, a line viewed in terms of its thickness becomes a plane and a plane considered in terms of its height becomes a volume. And in addition to these suddenly opened up spaces, there is the temporal dimension to be considered in such a longitudinal survey. Researchers who add a perspective do create an additional and different dimension for the object in question. Certainly, an object considered in terms of only one or two of these dimensions can still be adequately described. And yet, we would say that the plurality of dimensions constructed by combining methods in this way creates a new ‘alloy’ that helps to enhance understanding of that object and to give an original answer to the research question.

Each of the dimensions adds a degree of complexity, with the advantages and disadvantages these ambitions bring with them in terms of the data. The comprehensive dimension gives access to the meaning conferred to situations and relationships, but produces an enormous amount of material that is difficult to compare ; the statistical dimension makes it possible to measure the combinations of factors but requires the information to be formatted ; the longitudinal dimension gives access to the dynamics of changes and processes, but requires that dates be added to all the data for complex comparisons.

Thus particular attention had to be paid to the composition of the ‘alloy’, with the uses of the population databases, types of data and methods to be rigorously controlled when the analyses are being carried out.

5 Which databases for which questions: “leaps” under control

Thus while the analyses were carried out, the data had to be identified very carefully, with different logics applied depending on the research questions and dimensions (Morse and Niehaus, 2009; Onwuegbuzie and Combs, 2010). In concrete terms, different populations (Ego, EgoTempo, Alter, AlterTempo, DyadTempo, NetworkTempo) have been identified, but they were interlinked (Ego mentions Alter, the Ego-Alter dyads have relationships and the totality of Ego’s Alters constitute a network). All these populations could be contained in the same file, but when the variables and observations were mobilized, the following questions had to be asked for each operation : ‘In what population database do I have to locate myself here ?’ and ‘What methods can I use ?’.

5.1 Ego and Alter

When the analyst was located in the Ego-database, (s)he was manipulating data that followed Ego’s situations, with an identifier ‘Ego’ for the stable data, as well as an identifier ‘Ego-wave’ for the evolutionary data in the EgoTempo-database. For example, if we questioned Sidonie during wave 1 in 1995 and we met her again during wave 2 in 1998, we made a distinction between the ‘two’ Sidonies, the high-school student living with her parents and the

young married woman working as a secretary, by comparing, for example, their discourses, their links to work, their projects, and so on.

If the analyst was located in the Alter-database, (s)he would be considering the population made up of all the individuals mentioned by Sidonie and by the other respondent. This population totals 7096 Alters – including Elise, who was still regarded as Elise independantly of survey wave. The researcher would be able to identify some statistical trends on the basis of the variables that divided up this population (does it contain more boys than girls?), combine them with the Ego's sociographic attributes (are the Alter girls mentioned more frequently by Ego girls or by boys?) and also establish the contexts in which these Alters have mainly been met.

When the analyst was located in the AlterTempo-database, each Alter's occurrences during the various waves of the survey were differentiated. It was thus possible to measure evolutions over time : "Does this Alter population contain a greater or smaller share of family members or friends as the young people grew up ?", "Do girls have more or less female friends when they get married ?"

5.2 Dyads and relationships

In fact, it is especially in the 'DyadTempo-database' that the analysis will be able to display the richness of the dynamic dimension to the fullest extent. This database included the 10,804 observations of a relationship between an Ego and an Alter at a given moment. As a result, Sidonie-Elise-1995 emerged as a different case from Sidonie-Elise-1998 or Sidonie-Elise-2001. True, this choice led to overestimation of the characteristics of the Egos with many links and of those of the Alter who occurred in each wave of the survey. However, this 'overestimation' was considered not at all absurd from the point of view of network analysis, where the most relevant unit is the relationship, and particularly when it is known that the stable attributes of the Egos, Alters and relationships are much smaller in number than those varying over time.

By considering the totality of these young people's relationships at one stage of the survey and then at another, we were able in particular to see how relational modes, forms of proximity, the determinants of relational characteristics and so on evolved over time. The focus was then on questions such as: "Does membership of a group make ties stronger or more durable?"

The range of analyses able to contribute to answering our research question became ever more extensive as the various dimensions were considered. In particular, it became clear that, over and above the addition of new data or a contrasting point of view, these dimensions made it possible to pose new questions, as for example: "Which attributes of Alters have an impact on the quality of their relationships with Ego and their evolutions?"

5.3 Networks and structure

Nevertheless, the sociology of social networks showed that they function as systems, and cannot be reduced to the sum of the relationships of which they are comprised and were not limited to a census of the Alter population presented in the form of a list. After all, it was also important to see how these networks were arranged: were the Alters in one network closely connected with each other or were they dispersed and seen separately? This is a very important distinction, particularly for the socialization processes that are our concern here. A dense or highly interconnected network is more cohesive and united, rooted as it is in collective activities or encounters. A less dense network, with more 'holes' in it, is more fragmented but also more diversified. Such a network can offer a greater range of options and exerts less control. In

particular, individuals can develop a variety of opinions and behaviours by being in contact with associates who do not know each other, show different facets of themselves and innovate more.

We asked Ego to indicate on a circle which of his or her Alters associates with each other. On this basis, we compiled interconnection matrices that enabled us to draw the graphs of these networks and to calculate certain indices relevant to their structure.

In the analysis, therefore, it is important to introduce the dimension of the Ego networks at each wave, in order to consider their composition, density and structure. Thus an additional population in the analysis was located in the 'NetworkTempo-database' constructed of the totality of any one Ego's Alters and all of the links between them at any one time. What is being analysed, therefore, is the entity formed by each relational system centred on each Ego.

5.4 Combining data and methods

It is clear now that the complexity of the initial question and the desire to lose as little information as possible by adopting a multidimensional perspective caused the focus to switch from one population to another when the data was being interpreted, depending on the point in time and the questions being investigated. And depending on the question, these populations could be analysed through the use of qualitative methods (at the level of Ego's biographical trajectories) and of quantitative methods (at the level of the Alter populations and the dyads and relationships). However, qualitative methods could also be applied to the accounts of changes in relationships and the explanations for them, while structural methods could be used to analyse the composition and shape of personal networks. Finally, the longitudinal methods gave a temporal perspective to the whole system.

So, depending on the research questions, we were in a position to draw on several databases linked to each other. Even though they may not give rise to any statistical processing, the Ego databases supplemented the Alter and dyad databases as independent variables in the statistical operations. After all, in the Alter databases, Ego's attributes could be repeated for each Alter in his/her network (for example, the fact that Ego was a girl could be repeated for each line of her Alters, and each Alter could be identified as an 'Alter being mentioned by a girl'). The same applied to each line of the AlterTempo and DyadTempo databases, which could, moreover, include those of Ego's attributes that were evolutionary (for example, 'relationship mentioned by an Ego who was unemployed', 'relationship linking an Ego and an Alter who were both fathers' or 'relationship linking an Ego who was unemployed and an Alter who was employed').

At the network level, certain items of data could similarly have repercussions on the relationships (each relationship could be identified as a 'relationship that was part of a network of such or such a density' or as a 'relationship with an Alter who had a certain degree of centrality in the network').

These 'leaps' from one database to another were extremely productive, but the researcher must ensure that they were accomplished in a controlled manner. Taking a more specific example, we will now see how this system is used to produce original results.

6 An example: how relationships and networks influence trajectories

6.1 A multidimensional and precise topic

In order to illustrate the workings of this analytical system, we can look into the question of the 'significant others', which was one facet of our investigation. The link between sociability and socialization can be considered from two points of view: i) the effects of the progression towards adult life on networks and modes of sociability, and ii) the reversal effects of networks and certain relationships on young people's decisions and the orientations they take in life.

Concerning the effect of transitions on networks, previous analysis from this survey showed that network size and composition were very sensitive to certain ‘typical’ biographical events, such as starting work, setting up house with a partner and the birth of the first child (Bidart and Lavenu, 2005). At the time of the transition from the unified world of education to the more divided world of work, sociability becomes less collective and more intensive and young people become more ‘selective’ in their modes of association. These changes in the way of relating to others explain the reductions in network size observed more objectively by counting ties.

However, in this paper we intend to dwell on the reversal question: how do some network members influence an individual’s trajectory? We will describe in greater detail the transitions from one method and analysis to another.

6.2 Influential relationships: from qualitative to quantitative methods

Once the general network had been constructed by using the context-based name generator, two questions were asked to shed light on the topic of the influence exerted by others: “Which of these people would you ask for their opinion or advice on personal problems? (e.g. emotional difficulties, choices to be made). Why these persons? Why not others?”. A little later in the interview, the following question was posed: “In the last three years, have you felt to be at a crossroads, to have reached a point at which choices had to be made?”. Then was asked: “Are there any people who helped or influenced your choice?”. What was important here was that Ego could identify the potential and actual ‘influencers’ and that (s)he could explain the reasons why this Alter could influence him(her). We don’t dwell here on the various forms these influences might take. Of course, socialization processes cannot be reduced either to changes in network size or to the influence from significant others. Here, however, we prefer to stick to one specific example, as follows.

To which people in his/her network can an individual turn to seek assistance with his/her decision-making? Acknowledgement of influence is, after all, problematic. Identification of the enabling vectors and their dissociation from selection processes is an important task for sociologists and other scientists (Crandall, Cosley and al., 2008; Aiello, Barrat and al, 2010; Steglich, Snijders, Pearson, 2010; Mercken, Snijders and al., 2010). Consequently, we examine here the issue from various perspectives. The answers to the two questions that made it possible to identify influence were available in the interviews, making the survey initially more suited to qualitative methods. Nevertheless, the statement that such or such a relationship was or was not likely to be a channel for influence is easy to reformulate (yes/no). If we wished to compile a ‘portrait’ of a few specificities of these influential relationships, we could ‘import’ this part of the recoded subjective data (the feeling of being influenced by someone) into the data files in the DyadTempo-database. This one was more appropriate than the Alter-database since the same Alter may or may not be influential depending on the period in question and on the state of his/her relationship with Ego. It was even possible to recode *a posteriori* the reasons justifying identification by Ego of an influential relationship (‘why him?’), also included into the interviews. This operation of conversion neither removed nor corrupted the interpretative dimension of the young people’s accounts, which we also used in their entirety in another stage of the analysis in which qualitative methods predominate.

Thus the statistical dimension of these influential relationships could be approached and gave rise to a number of quantitative processing. The files in the DyadTempo-database contained 1358 influential relationships (12.6% of the total of 10,804 relationships). For example, the frequency of influential relationships could be examined in terms of the relational roles, using data from the questionnaires and information sheets that had been systemically coded. Friends were less prominent among the influential relationships than in the relationships as a whole (they

accounted for 51.4% of the influential relationships, compared with 62.8% of the total), whereas fathers and mothers, conversely, were more prominent in the influential relationships (18.3%) than in relationships as a whole (4.9%), as were brothers and sisters (10.5% compared with 4.5%) and boy/girlfriends (6.7% compared with 1.7%). Other dimensions of the relationships were important as well. For example, the influential relationships were of longer duration (median 5 years excluding family) than the entire set of relationships (median 3 years excluding family).

It was also possible to go back to Ego's attributes or even to his/her degree of similarity with those of the influential Alters. This comparison between Ego and Alter (excluding family) showed that they were more often of the same age (to within 5 years) in the case of influential relationships (85.7%) than in that of non-influential relationships (67.9%), and were also more frequently of the same sex (76.8% compared with 56.6%). Furthermore, the dynamic dimension made it possible to examine changes. For example, the share of family relationships in influential relationships declined over time and that of girl/boyfriends increased.

6.3 Why them? From quantitative to qualitative methods

The question then, obviously, is to ascertain why these individuals and these relationships were more influential than others, in other words why the young people allowed them to play a part in their decision making. In terms of statistics, here too we could use quantitative methods applied to the qualitative recoded responses. Simple sequential sorting indicated that the principal motives for acknowledging an influence (potential or actual) was related to the characteristics of the relationship: 72% of the 1524 responses fell into this category (in which affective characteristics topped the list, followed by confidence and trust), while 31% related rather to the characteristics of Alter and 6% explicitly mentioned similarity between Ego and Alter (multiple responses were possible). Many other operations could be carried out, but these already highlight the importance of the affective element of the relationships in encouraging acceptance of advice from others.

This assessment having been made, the analysis could continue by returning to the young people's statements in order to understand in greater detail why and how these characteristics invested the relationships with the potential for influence. After all, it might seem surprising that the affective element could be more decisive than Alter's competence when (s)he was asked for advice. Where did the importance of the affective element in influencing decisions stem from? The comprehensive dimension opened up by qualitative method clarified the link between the affective element of the relationship and the trust showed necessary to feel receptive to influence. Marie, one of the young people in the panel, put it:

‘(Why those persons?) Because I think they're the people best able to advise me. They're the people who love me most, I know they'll help me make the decision that's best for me, they won't get it wrong.’

With love, nothing is being ‘risked’, but it also guarantees that others will do their best to be honest and relevant. Of course we cannot examine here all the topics that were broached, but we may now see more clearly the thread leading from the affective element to trust, by way of confidence, all of them relational elements whose primary function is to reduce the uncertainty as to Alter's intentions. By being receptive to influence, Ego is, after all, putting him/herself in an awkward position, one of weakness towards Alter, but the affective elements in their relationship makes the exchange safe.

Nevertheless, the qualitative analysis clearly revealed a number of ‘influencers’ whose links with Ego were much weaker, less important and more recent, and who were able to exert influence precisely because they were not directly involved. As Clotilde says :

“Mathieu, as he is external to everything, there is no problem. It must not be people who know each other too much”.

There, in contrast, the affective dimension was rejected as an obstacle to ‘analysis’ of the problem and the necessary objectivity.

Thus the comprehensive dimension enlightened two relational logics favouring influence: one mediated through ties in which affective elements offer protection; and the other one through ties kept at a distance from personal issues. Neither of them, incidentally, is wholly exclusive. True, the first type predominated statistically, as the quantitative method revealed it, but the existence of the second one opened up new questions reachable by turning to another dimension. The perspective now shifts towards the structural dimension in the NetworkTempo-database in order to investigate whether these two logics could coexist within the same network and for the same young person.

6.4 Multiple influences: network as system

If we now consider as our unit of analysis the whole system formed by the network, what emerges is the variety of modalities and rationales mentioned by the same individual in order to explain the influence he or she received from it. The analysis here lies on the NetworkTempo-database and on the EgoTempo-database in which young people explained how they received influence from the system composed by their personal network, and not only from dyads. Thus Serge intended to benefit from the diversity of his network:

‘I think that, with all my friends, if I really had a major decision to make, I would discuss it in order to take many advice, to get completely different opinions, because they’re different people and so they’ll necessarily have different views.’

The motives for being ready to listen to these Alters could also take very different forms within the same network. An Alter was declared influent because he was older, another one in the same network because he was younger, another one because he was like Ego, another one because he was different... This diversity of reasons and advice, far from representing a difficulty, was positively encouraged by these young people. They often expressed a need to seek out divergent views, in order to carve out their opinion.

The composite nature of the influence can be likened to the notion of ‘the plural man’ (Lahire, 2011). Any one person does have several roles and combine several social “repertoires”: the same person, depending on the context and on the people she is speaking to, may be a serious colleague or a fanciful leisure-time companion, a responsible adult or a scatterbrained child. The various members of her personal network can be seen as composite mirrors of these multiple facets. From this point of view, a person’s network certainly provides a picture of her socialization by distributing images of herself, as well as diversified opinions and influences, which in turn affect her trajectory and the plans she seeks to put into practice.

6.5 Diverging views and segmentation: the contribution of the structural dimension

The diversity of views and options in personal networks could be seen as a web of contradictions, at least when all the network members communicate with each other. However, this global communication is generally not the case. The separation between the Alters produces a certain degree of ‘opacity of roles’ (Merton, 1965) and a freedom to choose between the diverging versions a person receives. Thus the structure of her network plays a part in shaping the distribution of influences (Burt, 1992; Ferrand, 2007; Lazega, Sapulete, Mounier, 2011). When the Alters do not know each other, they do not communicate and do not influence each other; if they did, their contributions would be standardized to a certain extent. Indeed, this question can be given full consideration by focusing now on the structural dimension, paying particular attention to the connections between the Alters, which can lighten the comprehensive dimension of the diversity of advice wished by respondents. Thus many young people not only preferred seeking advice from different people in order to hear contrasting opinions, as we have

just seen, but they also wanted these individuals to be more or less unknown to each other. In order to avoid interactions, they sometimes preferred to seek opinions from people who were not in contact with each other or who were not directly involved in the problem in question. Thus Nadège, faced with a very personal decision, preferred paradoxically taking advice from individuals who were not close to her and remained dissociated from the core relevant persons:

‘It was the decision on whether or not to have a child. I could have discussed it with my mother but I wasn’t too keen on that because I knew she’d fly off the handle straight away, that she’d say, “yes my girl, that’s great, I’m going to be a grandmother”... I talked about it with my colleagues at work, because I thought they were people a little outside from me who could give a proper advice. Sometimes you look to someone who knows the situation well for advice, but in this case I actually wanted to hear the opinions of people who were not involved.’

Such "outsiders" were not concerned by the consequences of the decision to be taken, they remained disconnected from the other protagonists and they weren’t about to make "judgements" that could affect Ego.

Thus, combined investigation of the characteristics of the Alters (quantitative analysis), of the reasons for their influence (quantitative and qualitative analyses of data that were initially qualitative), of the composition of the networks and of their cohesion (qualitative and structural analysis), finally enabled us clarifying the results. Influence tends to be exerted by parents and old friends with whom the ties are primarily affective, as well as by “outsiders” who are less closely involved in the immediate issues and remain disconnected from each other in a network that stays diversified in terms of influence patterns.

6.6 Interconnections: density of the network and centrality of the Alters

At this stage, we attempted to objectify and measure, in a large population, the degree of interconnections between the Alters. This measurement can be made in two dimensions. In the NetworkTempo-database, network density was calculated by the number of connections between the Alters relative to the number of possible connections within the network. We excluded for these measures family and boy/girlfriends, who are by definition more inter-connected, and weak ties (for which interconnections were not collected in the survey). At the individual level, the centrality of each Alter, that is his or her degree of connectedness with other Alters in the network, could also be measured (Freeman, 1978). This piece of information applies to the Alters but refers to their position in the network at a given moment. Consequently, it made a link between the NetworkTempo-database and the AlterTempo-database. This quantitative measure of centrality was then ‘imported’ into the DyadTempo-database in order to be used for statistical analyses. In particular, it was possible to combine it with individual and relational data, including influence. Once again, this combination of dimensions opened up new questions, of the type: ‘Are the influential Alters more interconnected within the network than the others?’. If they are, then the influence exerted on Ego would be relatively cohesive; if they are not, then it would be more divergent.

It seemed that the influential Alters were more connected to others than the non-influential Alters: the median of the centralities for all survey waves was located on 4 connections for influential Alters and on 3 for the non-influential ones. Thus the tendency to seek out the opinions of individuals who are not in a central position within the network was showed only for a minority, probably slightly reduced again by the exclusion of weak ties for the interconnections measures. This result does not reduce the significance of the qualitative analysis, which revealed ways in which ‘disconnected’ or ‘uninvolved’ individuals can exert influence, even if these were not numerically dominant. Most of the influences clearly lie within the most interconnected Alters.

But what happens over time?

6.7 A process of dissociation: longitudinal method and the temporal dimension

In the NetworkTempo-database, several overall measurements could be made of changes in network structuration, by separating out the four survey waves conducted at intervals of three years. The average values for the relative densities (proportions of Alter-Alter connections within the possible connections in each network), calculated for all the networks are: Wave 1: 0.308. Wave 2: 0.294. Wave 3: 0.268. Wave 4: 0.240. These values decline steadily, showing that the networks became less and less dense, which means they developed more and more ‘gaps’ in the meshing.

If we now turn to the AlterTempo-database in order to examine the relative centralities of the Alters at each wave of the survey, their general average also declines overall: Wave 1: 0.207. Wave 2: 0.202. Wave 3: 0.165. Wave 4: 0.149. Thus the tendency over time is towards more scattered Alters, disconnected from each other. Individuals became more and more likely to see their friends ‘one by one’ or ‘two by two’ and these friends were less and less likely to know each other.

In the DyadTempo-database, we could analyse statistically the evolution over time of the relationship between centrality and influence (Table 2).

Table 2: Class of centrality and influence from Alters for each survey wave

		wave				Total Alters (1)
Class of centrality		1	2	3	4	
Null centrality	influence	6.0%	12.8%	7.4%	17.1%	11.2%
	no influence	94.0%	87.2%	92.6%	82.9%	88.8%
	Total	100%	100%	100%	100%	100% (484)
Low centrality	influence	16.9%	15.9%	14.4%	19.8%	16.7%
	no influence	83.1%	84.1%	85.6%	80.2%	83.3%
	Total	100%	100%	100%	100%	100% (2340)
High centrality	influence	18.6%	32.3%	21.8%	18.7%	22.9%
	no influence	81.4%	67.7%	78.2%	81.3%	77.1%
	Total	100%	100%	100%	100%	100% (1104)

Note : % in columns (and absolute numbers). Significance threshold of 1%
 (1) excluding family, boy/girlfriends and weak ties : total 3928 Alters

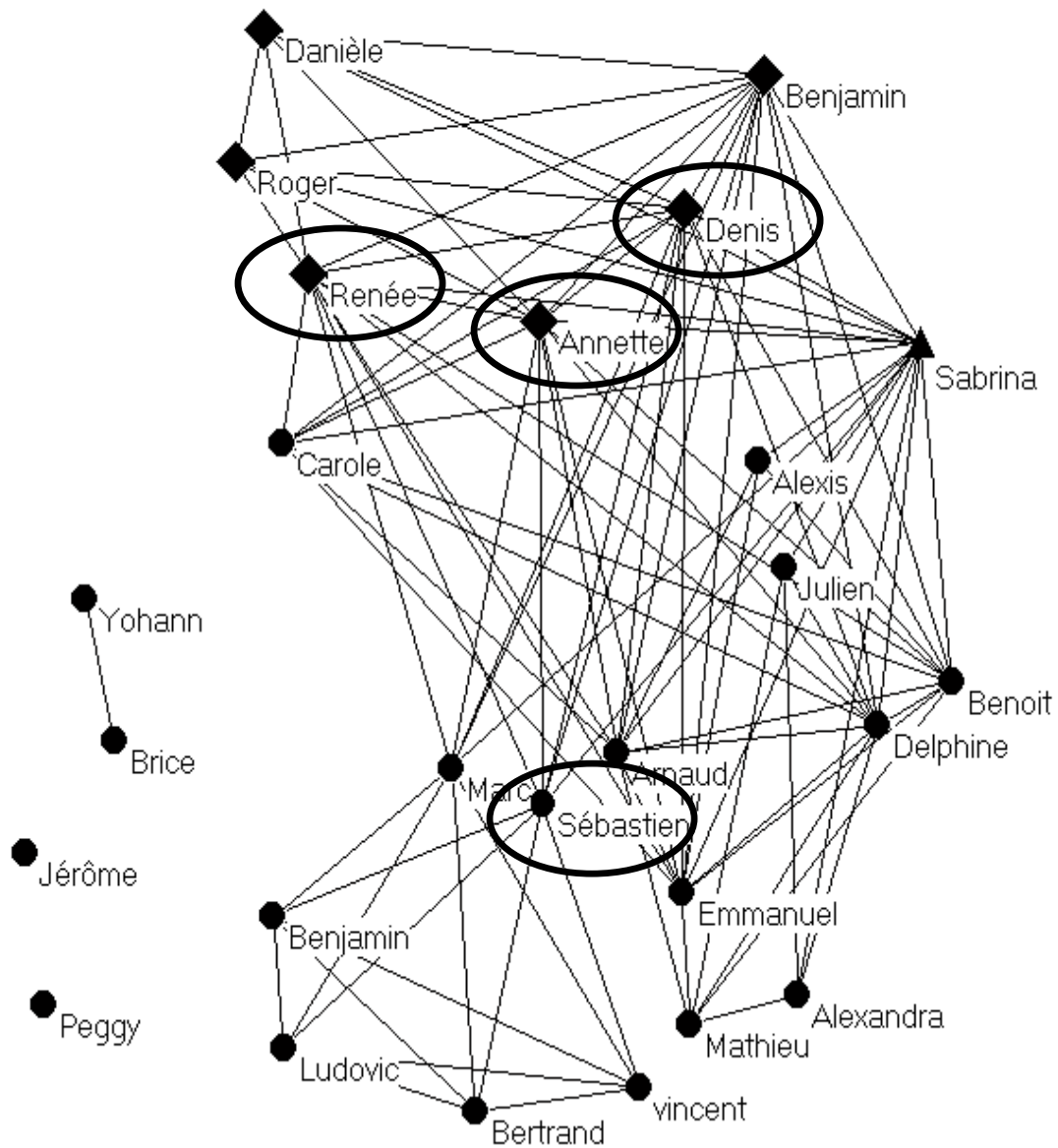
This statistical analysis revealed that the tendency for influence to be positively correlated with a high level of centrality (greater than the median value for centralities in the wave) was confirmed in waves 2 and 3, but weakened in wave 4, when low centrality (lower than the median value) accounted for the greater share of influential relationships (19.8% compared with 18.7% for high centrality and 17.1% for null centrality). The share of Alters who had zero (no connections) or low centrality increased significantly in wave 4. Thus as Ego progressed towards adult life, he became increasingly likely to acknowledge as influential the Alters who were isolated or had very few connections within his network.

What we observed here is a trend towards the dispersion of influence. The Alters in the high centrality category had less and less the prerogative of influence as the young people reached adulthood. This evolution goes towards a fragmentation of the network and an increasing opacity between its members; As a result, the network gives Ego greater opportunities to draw on a more varied range of views, whose diversity (s)he might exploit in order to possibly embark on a process of emancipation.

Let us examine as an illustration those two graphs representing the networks of Antoine on wave 1 (figure 1) and 9 years after on wave 4 (figure 2). Antoine (Ego) was not represented

on the graphs, but he was obviously connected with all his Alters. The influent Alters were marked with circles around.

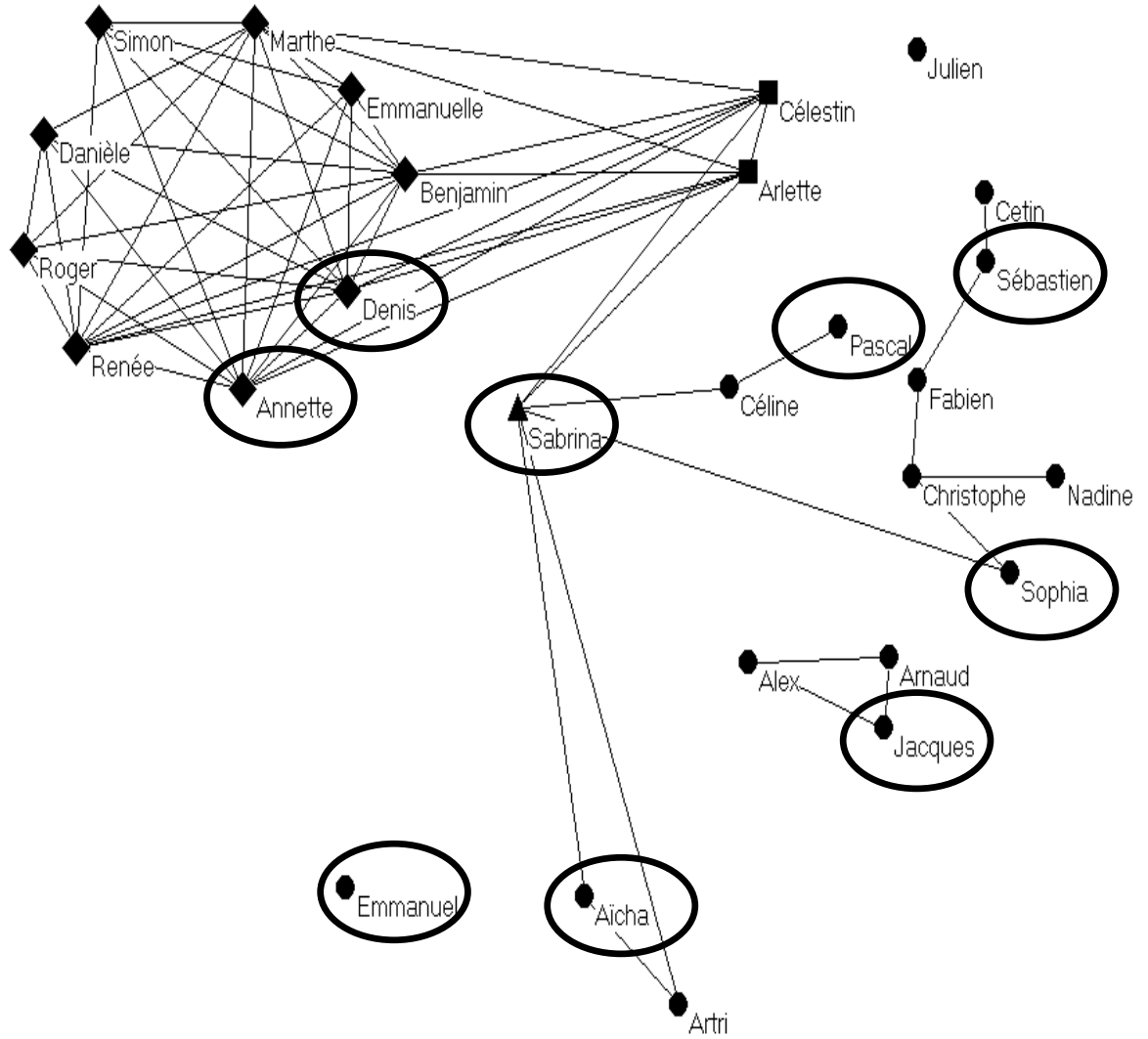
Figure 1 : The network of Antoine in 1995, with influent Alters encircled



Key :

◆	Ego's family
■	Partner's family
▲	Partner (<i>Alter-amour</i>)
●	Friend, mate, other

Figure 2 : The network of Antoine in 2004, with influent Alters encerclé



It appears clearly that Antoine's network is becoming less and less dense, and that influential persons become less and less inter-connected. Those dissociated Alters may give him more diverse advice. This shows that logic of uniformization of the network (by selection and influence combined dynamics) is not the only one at work (Friedkin, 1998).

It is by combining different dimensions and methods applied to the relevant population databases that we were able to shed light on the various logics driving this evolution in the place of significant others in the personal networks. These logics combine a certain selection of relevant Alters with affective ties, but also an accepted share of heterogeneity in the network and an increasing dissociation of its members.

These logics are all at work in the dynamics of personal networks, modes of sociability and socialization processes (Bidart, 2008). Only by switching the various dimensions, databases and methods has it been possible to enlighten their assemblage.

7. Conclusion: mixed methods as a processual system

A composite research question such as that of the interactions between modes of sociability and socialization processes must lead researchers to privilege a combination of points of view and methods, and to construct the relevant tools. The original design of this survey ensured that collected data and inherent dimensions and articulations allow to answering the research question. In attempting to do so, particular complexities had to be faced, such as those arising out of the fact that individuals' situations are unstable over time, or the need for the researcher to move frequently from one dimension to another through the analysis.

It has been our aim to explain here very precisely the procedures and difficulties and the solutions we experimented with, taking as our starting point a specific question that forms part of our overall research question: How do network members influence a young person as (s)he progresses towards adulthood ?

Rather than using in a disjointed and sequential way qualitative, quantitative and structural methods, we deployed a combination of the three of them at various levels of the research. We applied appropriate methods to distinguished but linked populations (Ego-database, EgoTempo-database, Alter-database, AlterTempo-database, DyadTempo-database and NetworkTempo-database). A certain degree of porosity may be practised with caution when qualitative data is temporarily recoded and used in quantitative analyses or when network-based measurements are applied to relationships. Thus, even though the research presented here is primarily qualitative, it does not seem to be essential to begin the analysis with any particular method, as the most rewarding approach undoubtedly seems to be to switch (under control) between methods of analysis. It is in fact the iterative processing of the individual, relational and structural dimensions that made it possible to create results concerning their interactions (Wellman and al., 1991; Bernardi, Keim, von der Lippe 2007).

Above all, having recourse to contrasted and combined dimensions proved to be a very rich approach in terms of explanatory potential. The research then proceeded in a way that led to the construction of a 'system' incorporating the various levels, multiple points of view and differences of emphasis. It drew on objective and subjective data and applied qualitative, quantitative and structural methods to differentiated populations in complex combinations that opened up new possibilities for posing questions and producing results.

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Appendix:

The survey design

This survey was launched in 1995 by Claire Bidart, Alain Degenne, Lise Mounier, Daniel Lavenu, Didier Le Gall and Anne Pellissier. It is a qualitative survey of a cohort of young people who were living in Caen, in Normandy (France), at the time of the first wave of the survey.

The sampling criterions were gender and the course of study. The young people contacted were in the senior year of general high school (*lycée général*) or vocational high school (*lycée professionnel*) or on various labour market integration programmes; each group contained more or less even numbers of boys and girls. The survey started just before a turning point for them, that is the french *baccalaureat* or the end of a training course. At that time, they were aged between 17 and 23. They were first contacted at school, in separate classes in order to avoid common members in their networks. The face-to-face questionnaires and interviews were conducted in their homes.

Wave 1, 1995 : 87 persons interviewed

Wave 2, 1998 : 74

Wave 3, 2001 : 66

Wave 4, 2004 : 60

They have been re-interrogated every 3 years, the interviewer travelling sometimes abroad to make interviews when they had moved (Boston, Oslo, Valencia, Rome...).

First, factual biographical details were recorded on standardized questionnaires and calendars outlining their trajectories over the three years since the previous wave of the survey, focusing on education, training and employment but also on family, home, leisure activities etc. Personal networks were constructed using a specific 'contextual name generator' tool. After asking one or two questions about all the possible contexts (more than 50 were proposed), they were asked:

'In (name of context – e.g. work), who are the people you know a little better, with whom you talk a bit more?'

The answers to these questions were used to single out the individuals (Alter) in a given context who were identified personally by the respondents (Ego). A filter question allowed to distinguish strong ties (here, relationships declared as important or multiplex – ie. sharing more than one activity), from weak ties. The questions were repeated for each context. The list of first names generated in this way provides the basis for constructing the personal network. With this procedure, the mean size of the networks is 37,6 Alters, the maximum being 131 and the minimum 6.

Then information sheets were compiled on those network members and on the characteristics of the relationships between Ego and Alter. At the end, the names (of strong ties only, for time reasons) were placed around a circle and the interviewee was asked to draw lines representing the connections between the Alters who knew each other (according to Ego) in order to measure the density of the network.

Then the interviewer went back to his office to compare those factual data about the trajectory and the network with those collected 3 years before.

A few days after, semi-structured interviews were conducted and taped, consisting of narratives and explanations by respondents of the biographical and relational changes that had happened between the waves of the survey, and of discussions on various matters of opinion.

Because of the multiplicity of spheres that were tackled, the interviews lasted between four and ten hours and were usually conducted over several meetings held several days apart.

These interviews were transcribed and archived with the software Word, and were indexed and processed with the software Nvivo 7. The factual biographical and relational data were coded and archived with Excel, then processed with SAS and SPSS. The network data were imported

from Excel to Pajek with an original interface facilitating dynamic dimension, “Tipnip” (<http://www.lest.cnrs.fr/tipnip/>). Then Pajek was used to draw graphs of the networks.

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For further information on this survey, go to: <http://halshs.archives-ouvertes.fr/halshs-00164797>