Sociological Theorizing and Quantification Practices in Survey-Based Research

Habilitation Thesis

Ana-Cosima Rughiniș

University of Bucharest

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Abstract

This thesis presents an overview of my scientific contributions and current research directions, against the background of relevant disciplinary debates. I focus on those areas of my previous research activity that are of most relevance for my current interests, in the methodological tradition of survey-based sociological research, which was the focus of my book on "Sociological Explanation" (Rughiniș 2007a). I present, on one hand, my research on ethnicity, in particular Roma / Gypsy ethnicity (Rughiniș 2011a; Duminică, Lupu, and Rughiniș 2009; Rughiniș 2010; Gabor Fleck and Rughiniș 2008), and, on the second hand, my research in the Public Understanding of Science program, concerning the stock of public knowledge of science, or 'scientific literacy' (Rughiniș and Toader 2010; Rughiniș 2011b; Vlăsceanu, Dușa, and Rughiniș 2010).

In both fields, my overarching research interest has been to evaluate current survey quantification practices as regards their theoretical grounding and affinities. In this thesis I start from my previous research results and I propose solutions for quantification methods that support an interactionally-oriented theoretical perspective. I therefore present the significance of my research in light of a broader and more far-reaching discussion, namely the evaluation of survey-based research with reference to its basic theoretical assumptions concerning social action and interpersonal interaction independently of their thematic specificities.

One of the groundbreaking works in this current of reflection has been Aaron Cicourel's "Method and measurement in sociology" (1964). Much of the ethnomethodologically-informed work concerning the theoretical bearing of survey-based inquiries takes standardized interviews as a research topic, studying it as a particular form of social interaction without aiming to formulate proposals of practical import. Critics that denounce "the folly of the whole enterprise", as Hammersley (2010) puts it in his recent take on this topic, do not engage the technicalities of survey-based research because they do not see the possibility to improve them or to render them (more) theoretically meaningful. My research is significant insofar it contributes to the fine thread of discussion attempting to bridge the interactional theoretical orientation with the practicalities of survey-based research, by selecting several points of contention and proposing solutions.

I have oriented my analyses to what I considered to be the dominant debates in survey-based research in the fields of Roma / Gypsy ethnicity and scientific literacy. After analyzing the problems formulated in these debates and the proposed solutions, inside and outside survey practice, I have directed my attention towards three broad topics of controversy: 1) the 'operationalization' issue, or how to link concepts to measures, 2) the issue of causality in sociological explanation, and 3) moral quandaries – which derive from survey analyses' reliance on common-reason categories and concerns.

Despite the centrality of measurement in survey methodological discussions, in actual research the theoretical justification of measurement practices is often very limited. The methodological and material constraints of the standardized interview instrument selectively support some directions of theoretical grounding at the expense of others. At the same time, in recent years the practice of advanced statistical analysis has developed considerably and has become increasingly accessible – bringing its own theorizing affinities. Its development has benefitted from increasing access to personal computers, and also from its disciplinary-independence: economists, political scientists, psychologists, sociologists, epidemiologists, and even specialists in natural sciences can be trained

together in advanced statistical techniques, and can contribute to further refinements of statistical procedures. The repertoire of statistical analysis affords analysts a rich array of methods that largely support a de-contextualized view of data, encourage efforts to translate data into stable traits of individual respondents or aggregates of respondents, and boost a causally-oriented vocabulary in data analysis.

As regards ethnicity, I find that considerable methodological energy is put into refining ethnic categories in questionnaires and eliciting 'honest' answers from respondents. The issue is largely defined as one of truthful classification, one that would match respondents' 'identities'. A secondary research move involves refining the measurement of ethnicity conceived as 'identity', departing from simple, clear-cut classifications while endorsing the view of ethnicity as a shared individual internal trait. These concerns marginalize theoretical preoccupations with the boundary-making and other interactional stakes involved in the use and refinement of ethnic vocabularies, and with their contextual and pragmatic, rhetorical relevance. As a consequence, the common reason practices of maintaining the stability, omni-relevance, and causal influence of ethnicity are non-problematically imported into survey-based sociological research.

As regards scientific literacy, I find that the survey use of the National Science Foundation scale has supported a narrowing of the concept into a stable trait located in the individual mind, largely independent of the contexts of learning and use of scientific constructs. I argue that the interactional relevance of public knowledge of science can be observed and analyzed when looking at the debate over 'knowledge of evolution', and I propose a distinction between 'animated' and 'quiet' scientific constructs to address this problem.

My analysis of survey research on ethnicity and scientific literacy illustrates four areas of discontent which I have selected as critical and also amenable to interactionally-aware solutions: the error-trait device, the use of a quasi-causal vocabulary, imputation of relevance, and resonating typologies. I propose several corresponding analytical orientations to avoid these points of contention: a) analyzing and interpreting data as collaborative results of situated interaction, b) re-specifying the concept of 'error' in line with participants' understanding of what counts for a mistake, c) evaluating analysts' use of categories by reflecting on their variable contextual relevance in social interaction, d) increased theoretical attention to typification and second-order typology construction, e) an avoidance of the quasi-causal statistical jargon, and less focus on statistical significance in favor of a preoccupation with substantive troubles of quantification and issues of absolute and relative size, and f) attention to the reliance on common reason categories and concerns, to our commentaries on them, as analysts, and to how our findings are likely to be taken over in common reason social knowledge claims.

Rezumat

În această teză voi discuta contribuțiile mele științifice și direcțiile mele actuale de cercetare în contextul dezbaterilor relevante din literatura de specialitate. Mă voi concentra asupra celor mai semnificative arii ale activității mele de cercetare din perspectiva intereselor mele curente; este vorba mai ales despre publicațiile din tradiția metodologică a cercetărilor sociologice prin anchete cantitative (sondaje), către care m-am orientat și în lucrarea „Explicația sociologică" (Rughiniș 2007a). În cele ce urmează voi prezenta, în primul rând, cercetările mele privind etnicitatea, cu precădere etnicitatea romă / țigănească (Rughiniș 2011a; Duminică, Lupu, and Rughiniș 2009; Rughiniș 2010; Gabor Fleck and Rughiniș 2008). Apoi voi trece în revistă contribuțiile pe care le-am realizat în domeniul cunoașterii publice a științei, în tradiția *Public Understanding of Science*, cu referire la conceptul de „alfabetizare științifică" (Rughiniș and Toader 2010; Rughiniș 2011b; Vlăsceanu, Dușa, and Rughiniș 2010).

În ambele domenii interesul meu dominant a constat în evaluarea practicilor curente de cuantificare în anchetele sociologice, evaluând întemeierea lor conceptuală precum și afinitățile lor pentru anumite teorii ale acțiunii sociale. Pornind de la rezultatele cercetărilor mele trecute, în această teză propun câteva soluții privind strategii de cuantificare care sprijină o perspectivă teoretică orientată interacțional. Prin urmare, în această teză discut semnificația cercetărilor mele pe fundalul unei preocupări mai ample și cu mize teoretice mai mari - și anume, studiul presupozițiilor teoretice de bază ale cercetărilor sociologice pe bază de sondaj privind acțiunea socială și interacțiunea interpersonală.

Una dintre lucrările fundamentale în această zonă de reflecție o constituie cartea lui Aaron Cicourel "Method and Measurement in Sociology" (1964). O mare parte a cercetărilor inspirate, cel puțin în parte, de perspectiva etnometodologică privind relevanța teoretică a investigațiilor prin anchete cantitative se apleacă asupra interviurilor standardizate ca proces social specific, studiindu-le ca formă de interacțiune - fără a urmări însă să formuleze recomandări sau soluții. Criticii care denunță „nebunia întregului demers" („the folly of the whole enterprise", în formularea sugestivă a lui Hammersley, 2010) nu se implică și în discutarea și evaluarea tehnicalităților sondajelor, deoarece nu văd posibilitatea ca acestea să fie utilizate cu vreo miză teoretică. Cercetările mele sunt astfel importante în măsura în care contribuie la o zonă destul de restrânsă a dezbaterilor, selectând anumite aspecte problematice cheie din practica metodologică a sondajelor în ariile tematice discutate, pentru care ofer ilustrații și propun soluții.

În munca de până acum mi-am orientat atenția către dezbaterile pe care le-am considerat cele mai importante și mai intense în studiile cantitative sociologice privind romii / țiganii și cele privind cunoașterea publică a științei. Pe măsură ce am reflectat la problemele formulate în aceste dezbateri m-am îndreptat către trei mari teme controversate: 1) chestiunea operaționalizării, sau cum pot fi legate conceptele de măsurători; 2) chestiunea cauzalității în explicațiile sociologice și 3) dificultățile morale – care derivă deseori din întemeierea ne-reflexivă a sondajelor pe categorii și preocupări ale cunoașterii noastre comune, practice.

În ciuda centralității problematicii măsurării în discuțiile metodologice din cercetarea prin sondaj, justificarea teoretică a modelelor de măsurare în practica de cercetare empirică este adeseori foarte limitată. Constrângerile metodologice și materiale ale chestionarului ca instrument încurajează anumite direcții de întemeiere teoretică în defavoarea altora. În paralel, practica analizelor statistice

avansate a devenit tot mai accesibilă, inducând propriile sensibilități teoretice. Dezvoltarea sa se bazează atât pe avansul tehnologiei, mai ales al calculatoarelor personale, dar și pe independența sa disciplinară: economiștii, specialiștii din științe politice, psihologii, sociologii, epidemiologii și chiar specialiștii în științe ale naturii se pot întâlni în cursurile de formare în analiză statistică, contribuind ulterior la rafinarea acestora. Repertoriul analizelor statistice permite analiștilor un evantai larg de metode care, în linii mari, încurajează o abordare decontextualizată a evidențelor empirice, susțin interpretarea datelor ca indicând trăsături stabile ale respondenților individuali sau ale agregărilor acestora, și dezvoltă un vocabular analitic cu concepte cauzale.

În ceea ce privește etnicitatea, în cercetările mele anterioare am observat că o mare parte a discuțiilor metodologice se concentrează pe rafinarea categoriilor etnice utilizate în chestionare și pe găsirea tehnicilor de încurajare a subiecților să răspundă „onest". Problematica asumată este cea a clasificării veridice, a adecvării etichetelor etnice la identitatea reală a respondenților. O dezvoltare secundară ca amploare constă în elaborarea unor scale și proceduri de măsurare a etnicității ca „identitate" – depărtându-se deci de utilizarea clasificărilor simpliste, dar susținând, în același timp, concepția etnicității ca atribut individual, interior persoanelor, chiar dacă împărtășit socialmente. Aceste interese de cercetare pun în umbră preocupările teoretice privind procesele de trasare și menținere a granițelor etnice, precum și sensibilitatea pentru mizele interacționale ale utilizării vocabulariilor etnice și pentru relevanța lor pragmatică, retorică. Prin urmare, practicile de simț comun prin care susținem în viața de zi cu zi stabilitatea, omnirelevanța și puterea cauzală a etnicității sunt importate ne-problematic în cercetarea sociologică pe bază de sondaj.

În ceea ce privește alfabetizarea științifică, am observat că utilizarea scalei *National Science Foundation* a încurajat o re-specificare a conceptului ca trăsătură stabilă a respondenților, localizată în mințile lor individuale, și relativ independentă de contextele de învățare și invocare a constructelor științifice. Am argumentat că relevanța interacțională a cunoașterii publice a științei poate fi observată atunci când analizăm dezbaterea privind „cunoașterea evoluției" și am propus o distincție între constructe „animate" și „inerte" pentru a ține cont de această problemă.

În analiza sondajelor sociologice privind etnicitatea și alfabetizarea științifică am ilustrat patru aspecte problematice pe care le-am evaluat ca fiind critice, dar posibil de soluționat într-un spirit teoretic interacțional: dispozitivul „eroare – trăsătură individuală", utilizarea unui vocabular cvasi-cauzal, imputarea relevanței și apelul la tipologii care rezonează cu cunoașterea comună. În această teză propun câteva re-orientări analitice prin care aceste probleme pot fi evitate: a) analizarea și interpretarea datelor de sondaj ca fiind rezultate colaborative ale interacțiunilor situate; b) respecificarea conceptului de „eroare" în consonanță cu ceea ce participanții la acest demers identifică, în general, ca fiind „greșeli"; c) problematizarea utilizării analitice a categoriilor prin reflecția asupra relevanței lor variabile și contextuale în interacțiunea socială; d) o atenție teoretică sporită la procedurile de tipizare și de construire a tipologiilor de nivelul doi; e) evitarea jargonului statistic cvasi-cauzal și diminuarea importanței argumentative acordate semnificației statistice (probabilității de eroare *p*) în favoarea unei preocupări cu problematica de substanță a cuantificării și a interesului pentru dimensiunile absolute și relative ale proceselor măsurate; nu în ultimul rând f) o atenție crescută asupra preluării categoriilor și preocupărilor din cunoașterea socială practică de simț comun și asupra felului în care noi le comentăm în ipostaza de analiști și a felului în care rezultatele investigațiilor noastre sunt preluate și re-integrate în practicile cotidiene de cunoaștere.

1 Introduction

I will briefly describe in the following section the development of my research involvement and interests after completing my doctoral studies. I aim to sketch my professional journey up to date, in order to clarify the research questions that have oriented my recent work, their transformation in current projects, and their public relevance. I am deeply indebted to my colleagues, students, family, and friends for supporting and giving meaning to my work. In writing this thesis I have received constant encouragement and counsel from Professor Lazăr Vlăsceanu, and I have sought and found much appreciated advice and theoretical guidance from Puiu Lățea. I am grateful to Professor Dumitru Sandu, Bogdana Humă, and Ștefania Matei for making inspiring commentaries, critiques, and corrections of my arguments.

Overall, my professional trajectory covered in this thesis has included a period of interest in social exclusion and ethnicity, during my doctoral studies, then a post-doctoral period of increasing involvement and training in advanced quantitative research, and, most recently, a period of relative disenchantment with survey-based sociological knowledge and the modes of attention that it encourages for researchers, at least in my own experience. A combination of interest in quantification practices, appreciation for the practical value and argumentation power of numbers, and interest in social theory encouraged me to search for ways to put these powerful and highly-used instruments in the service of sociological theories of the interaction order (Goffman 1983; Sacks 1995; Warfield Rawls 2011; Warfield Rawls 1987). This thesis reports on my research contributions up to date, and discusses their significance for an attempt to re-orient the theoretical bearing of survey-based sociological research.

1.1 Professional journey

My research career in sociology has started with a first change of mind: I had promised myself that I would not do research concerning Roma / Gypsy people, because the field seemed already overpopulated. My plan notwithstanding, I gradually became involved in several research projects addressing Roma issues and, later, my growing experience invited even more involvement. If, in the early beginning, I felt little, if any interest in issues related to Roma people or topics such as poverty or ethnicity, during my six years of doctoral research I often felt curious, perplexed, sympathetic, sorry, embarrassed, illuminated, and in many other ways, while making sense of unexpected interactions.

In brief, my involvement in research projects on Roma and Gypsy issues has been a period of escalating puzzles, which I tried to sort out and finally to shape in a canonical sequence of theory, questions, methods, and answers in my doctoral thesis. This effort of structuring questions and answers left some residual uncertainty as to the overall significance of my research approach, and, in particular, my quantitative research on topics related to Roma ethnicity.

After reading Michael Stewart's inspiring draft paper on "Approaches to Roma and Gypsies from within social anthropology with particular reference to the Anglo-Saxon traditions" (Stewart 2008), I started to work on a review of the quantitative research on Romanian Roma, with which I was familiar. One question that became increasingly important for me was: what can we learn from the aggregated body of datasets and reports on Roma? Is there any accumulation of knowledge, be it by the sheer amassment of data? I could vouch that the biographical research experience was worth

the effort – but is there any interesting pattern that emerges, for a distant reader, from revisiting these results?

A secondary concern was whether quantitative research on Romanian Roma is a meaningful contribution to the wider sociological and anthropological research tapestry. Granted the methodological difference, is there a theoretical convergence, or some dialogue that pushes reflection further?

My article (Rughiniș 2010) is the result of my attempts to put order and make sense of the rich empirical data collected in the surveys to which I have participated and the ones I had access to. I concluded that much of the theoretical-cum-methodological discussion on operationalizing Roma ethnicity revolves on the issue of self- versus hetero-identification, and I argued for the use of self-identification, on what I see now to be a combination of moral, practical, and theoretical considerations. I have discussed the use (or lack thereof) of community level variables, which are deemed important for analysis and for sampling as well. I observed that the distribution of Roma across heterogeneous and mixed communities, as well as what I termed the "self-identification reluctance error" were blind spots of the survey instrument; therefore, we have to rely on other information or insights to sort them out. Lastly, while examining an overall chart for the distribution of education in the surveyed Romanian Roma population, I concluded that, although the results were by and large consonant, there is a non-intelligible variation that does not seem to amount to a tendency and does to seem to reflect variations in the sample type (which was my initial hypothesis). Therefore, it seemed to simply indicate imprecision or, maybe, indecision of another kind – such as a fundamental ambiguity and oscillation of what it means to be a Romanian Roma. Moreover, important survey questions were phrased differently, thus discouraging comparison. To put it here more bluntly than I wrote in the published article, I did not find persuasive evidence for the possibility to cumulate empirical survey data on Romanian Roma, at least up to date.

I have next turned to the question of concepts (Rughiniș 2011a): What is it that we observe by quantifying Roma ethnicity in survey research? Moreover, what is it that we mean by ethnicity? Is there a dialogue between current understandings of ethnicity in other strands of social research and the uses of ethnicity in surveys? By and large, I concluded that conceptual models of ethnicity in quantitative research are simplistic even for quantitative standards – for example, in comparison with measurements of religiosity. Ethnicity is measured and often also interpreted according to its common reason functioning – as a categorical, distinctive, individual deep trait that is causally relevant for understanding behavior. While part of the trouble lies in its operationalization as a categorical variable, additional perils derive from statistical analysis models. For example, controlling for additional variables such as 'education' or 'income' when studying differences associated with ethnicity often makes no theoretical sense at all, a point also underlined before by Steinberg and Fletcher (1998) and G. D. Smith (2000), but largely ignored in empirical research. Regression coefficients, an often sought-for result interpreted as the 'influence of ethnicity' when other variables are 'controlled for', indicate in many research designs the amount of residual mystery, rather than the amount of causal influence. Moderating effects, which are often not estimated, may be highly theoretically relevant.

In these two recent papers I have contributed to a steady debate on measuring and using ethnicity in survey-based research (see for example Aspinall 1997; Chandra and Wilkinson 2008; Connolly 2011; Kwan and Liem 2000; Mateos, Singleton, and Longley 2009; Phinney and Ong 2007; Simon 2011;

Singh 1997; Burton, Nandi, and Platt 2010; Mays and et. al. 2003; T. W. Smith 2008; American Sociological Association 2003; Aspinall 2001; Bhopal 2006; Brown and Langer 2010; Stephan and Stephan 2000; Winker 2006), and to a distinctive thread on the practices of surveying Roma / Gypsy populations (Durnescu, Lazar, and Shaw 2002; Ahmed, Feliciano, and Emigh 2006; Babusik 2004; Emigh and Szelényi 2001; Gábor Fleck and Rughinis 2008; Gabriel Bădescu and et.al. 2007; Hajioff and MCKee 2000; Sandu 2005; Csepeli and Simon 2004; Ladányi and Szelényi 2001; Szelényi 2001; Ladányi and Szelényi 2002; Prieto-Flores 2009; Zamfir Catalin and Preda Marian 2002; E. Zamfir and Zamfir 1993). My discussion frame has oscillated between a methodological orientation (searching for practical solutions to problems of data management) and a theoretical one (aiming to understand ethnicity as a social process). In this thesis I elaborate in more detail the theoretical relevance of some methodological debates within survey research on Roma / Țigani, which I investigate as a particular case of survey research on ethnicity.

Besides the sociological questions pertaining to methodology and theory, during some of the many discussions with Roma and non-Roma people active in the Roma rights movement and during collegial debates I confronted some disquieting questions and comments, which I interpreted as moral, and may also be thought of as paradigmatic. We may ask ourselves: What are we actually doing, socially, when we are doing quantitative social research and telling reports and other stories about it – say, on issues related to the Romanian Roma people? How do we participate, in various daily interactions, in shaping ethnicity as a resource for social classification and attribution processes?

The first signs of trouble appeared for me when I met the discontent of people in the Roma movement that most Roma research, including surveys, portrays Roma people as poor, uneducated, and generally at a loss in society. Roma people's lives are explained away by lack of education and poverty, occasionally including discrimination. Nowadays I understand this problem by the observation than quantitative survey research risks to accomplish, in effect, an Othering of the Roma people, depicting them as *interactionally incompetent* for many practical purposes (Warfield Rawls and David 2006). When writing the "*Come Closer!*" book (Gabor Fleck and Rughiniș 2008), we tried, as a research team, to mitigate this alterization damage by several means: methodologically, by appealing to community case studies; stylistically, by including in the report photos that portray un-diminished persons; contentwise, by including a discussion, in the Conclusions section, on "Constructing the "Average" and the "Middle" Roma Subject" (pp. 217-218). The question remained, for me, how (and if) it is possible to put to use quantitative methods of research and reporting while acknowledging the radical heterogeneity of experiences of all the people aggregated in an average. In retrospect, a more appropriate formulation would be: whether, and how, quantitative social research can produce portraits of people as socially (interactionally) competent persons.

In my postdoctoral research years I have attended several training courses in advanced statistics, focusing on latent variable models (structural equations, latent class, GLAMM) and other advanced techniques (multilevel analysis, data imputation for missing values, and, generally, methods for survey design). During the same period my research interests gradually shifted towards the sociology of scientific knowledge, and the STISOC[1] project offered me an opportunity to get involved in hands-

[1] "Science and Society. Interests and perceptions of the public concerning scientific research and its results" (Ştiinţă şi societate. Interese şi percepţii ale publicului privind cercetarea ştiinţifică şi rezultatele cercetării), financed by NASR - National Authority for Scientific Research (ANCS - Autoritatea Naţională pentru Cercetare Ştiinţifică), principal investigator L. Vlăsceanu, Department of Sociology and Social Work, University of Bucharest [grant number 203CPII/10.09.2008].

on analysis of quantitative evidence on scientific literacy. I took over to this new field the persistent questions: what concepts of public knowledge of science are used in survey-based research? Is there a dialogue between the quantitative strands of research and the ethnographic research on those topics, or other qualitative approaches?

As I have discussed in Rughiniș (2011b), processes of translation between theory and standardized measures are bi-directional, because quantification and subsequent statistical analysis accomplish at least some implicit theorizing. For example, the very same collection of items may bring about a different concept in a reflective versus a formative measurement model. My research approach in this field has been 1) to propose conceptualizations of scientific literacy that are better compatible with the measures used in survey-based research, 2) to point out the incongruencies between theoretical concepts and specific practices of measurement, and 3) to propose concept operationalizations and research strategies that would mitigate the troubles, while broadly addressing the same research questions.

1.2 Current research orientation

The question which I now address, in my research, is how to reformulate the research questions in quantitative survey-based investigations, together with the methodological and discursive apparatus employed in data production and in reporting, in order to support an analytical sensitivity towards the competence of social actors and the interactional accomplishment of social institutions. I start from the assumption that quantitative survey-based social research is here to stay, for the foreseeable future, and it affords a powerful and potentially useful public argumentation repertoire for sociologists. How can it be shaped such as to afford a more theoretically relevant and humanistically oriented understanding of social processes?

In her pungent critique of sociological research, especially of the quantitative flavor, Dorothy E. Smith presents a recipe for "representing what people think" with three tricks, adapted from Marx and Engels' "The German Ideology" (D. E. Smith 1974):

> *Trick 1. Separate what people say they think from the actual circumstances in which it is said, from the actual empirical conditions of their lives and from the actual individuals who said it.*
>
> *Trick 2. Having detached the ideas, they must now be arranged. Prove then an order among them which accounts for what is observed.*
>
> *Marx and Engels describe this as making 'mystical connections'. [. . .]*
>
> *Trick 3. The ideas are then changed 'into a person', that is they are constituted as distinct entities to which agency (or possibly causal efficacy) may be attributed. And they may be re-attributed to 'reality' by attributing them to actors who now represent the ideas (p. 41).*

Quantitative research is easily recognizable, Smith also argues further, with its de-contextualized survey responses that are statistically processed, in what she sums up as "intervening procedures which it would be tedious to elaborate on here". My research contributes to the detailed analysis of these very procedures, as they are used in survey-based sociological research on Roma ethnicity and scientific literacy, and to the discussion of their theoretical assumptions concerning social action in general and interpersonal interaction in particular.

My first research contributions have mostly been in the fields of community development (Pop and Rughiniș 2000; C. Zamfir and Rughiniș 2000; Larionescu, Rughinis, and Radulescu 1999; Rughiniș 2002a; Cozma, Rughiniș, and Sultănescu 2003; Rughiniș 2004a; Rughiniș 2004b; Rughiniș 2001;

Rughiniș 2005) and subjective well-being (Rughiniș 2007b; Rughiniș 2002b). My recent research has focused on ethnicity (Duminică, Lupu, and Rughiniș 2009; Rughiniș 2002c; Gabor Fleck and Rughiniș 2008; Rughiniș 2010; Rughiniș 2011a), public understanding of science (Rughiniș and Toader 2010; Rughiniș 2011b), secularity (Rughiniș 2006; Máté-Toth and Rughiniș 2011; Rughiniș and Răuțu 2009). In the following sections I will elaborate on the significance of my recent research within a strand of literature dedicated to understanding quantification in sociological research and its theoretical implications. My contributions consolidate a relatively under-studied research thread that attempts to make survey research relevant in light of interactional sociological theories.

In what follows I will first review the literature on sociological surveys as forms of knowledge, and the theoretical debates in which surveys are central topics, in order to chart the theoretical landscape in which I situate my research. I go on to discuss survey-based research on Roma / Gypsy ethnicity, highlighting the theoretical perspectives in this field, the theoretically-relevant methodological debates, and the results of my analysis. I then move to survey research concerning public knowledge of science, following the same steps: a review of the theoretical context in which these surveys operate, then a discussion of several central methodological debates, and my evaluation of the theoretical implications of alternative solutions. I conclude this section by highlighting the theorizing affinities of methodological choices in survey-based research, and proposing a revised survey-based research approach that supports an interactionally-sensitive theoretical perspective.

2 Sociological theorizing in survey-based research

There are two areas of sociological theory for which surveys are of interest. On the one hand, surveys produce data that may serve as evidence in light of a particular theory. For example, surveys on ethnicity generate evidence for questions informed by sociological theories of ethnicity: how large are social inequalities created by processes of ethnic differentiation? What is the intensity of ethnic differentiation in a given society, at a particular moment in time? What is the relevance of ethnic categorization for a specific type of social action?

2.1 A theoretical sketch: the "trait" versus "interaction-order" divide

On the second hand, if we adopt a narrower focus, surveys are in themselves a form of social interaction. Therefore, in order to use them as investigative instruments, researchers rely on a theory of the survey interview situation – be it implicit or explicit (Cicourel 1964). From a logical point of view, the theoretical understanding of the interview situation represents a particular instance of the theoretical understanding of social action and interpersonal interaction in general. Still, the two need not be perfectly aligned in research practice, as I discuss below. I have drawn a sketch of the two levels of theoretical orientations in Table 1. I have divided sociological theories of social action into two types, with a coarse granularity that serves my specific purpose, rather than offering a critical review of the state of sociological theory. My purpose is to distinguish two divergent theoretical approaches that are relevant to the practice of social surveys: a perspective that focuses on individual traits (marked with [IT] for **i**ndividual **t**raits), versus a perspective that focuses on the interaction processes in the interview situation (Cicourel 1964; Maynard and Schaeffer 2000; Hammersley 2010) (marked with [IO] for **i**nteraction **o**rder). The first view is the most generally used in quantitative sociological research bases on surveys. The second has been used in methodological discussions of the interview situations, and also in research that studies surveys per se, as social interaction, without attempting to improve their usefulness as research tools.

An example of the individual trait approach used in research in a varieties of social research disciplines, originating in social psychology, is the Theory of Planned Behavior and its extended form, the Theory of Reasoned Action (Ajzen 1991; Madden, Ellen, and Ajzen 1992). This perspective has generated a rich body of survey-based research on diverse behaviors, also allowing for meta-analyses (Sheppard, Hartwick, and Warshaw 1988), and it continues to enjoy intense empirical and theoretical attention (Ajzen 2011; Langdridge, Sheeran, and Connolly 2007; Trafimow 2009). While this theory incorporates social interaction as previous events that generate norms and beliefs, it aims to predict social behavior across different settings, without taking into account its interactional organization. In other words, social interaction is always in the past, transmitted into present action via its influence on actors' beliefs and subjective norms.

Alternatively, interaction order theories see interaction as very much in the present tense of actors' actions: behavior is understood as partaking in a local, contextual order which it creates and to which it orients (Goffman 1983; Sacks 1995; Warfield Rawls 2011; Warfield Rawls 1987).

Ethnomethodology and the currents that it has inspired, such as Conversation Analysis (CA) and its thread of Membership Categorization Analysis (MCA), or Discursive Psychology (DP), attempt to understand social interaction as situated cooperative accomplishment. From this perspective it does not make analytical sense to occasion an interaction, with a given structure of relevances (such as

the one imposed by the activity of filling in a questionnaire), in order to understand other interactions, in completely different settings and with alien structures of relevances (such as voting). In experimental methodological parlance, the issue of representative design (Hammond 1998) becomes critical. A second major difference between trait-based theories and interaction-based theories refer to their views of language and communication. While trait-based investigations rely on language to express inner, subjective states (such as beliefs, desires, opinions, attitudes, values, preferences and the like), from an interactional perspective language use is understood, following the late Wittgenstein's philosophy, as a pragmatically oriented interaction, that invokes and attributes mental states as elements of intelligible accounts of actions. Words lose any correspondence with alleged inner individual entities, and they become virtually meaningless when abstracted from interaction (to the extent that this is ever possible).

One of the groundbreaking works that looks closely at survey-based research from an interactionally-sensitive theoretical perspective is Aaron Cicourel's "Method and measurement in sociology" (1964). Ethnomethodology and its related theoretical threads have also supported a substantial body of research on survey interactions (Maynard and Schaeffer 2000; Maynard, Freese, and Schaeffer 2010; Moore 2004; Potter 2003; Roulston 2006; Antaki 2006). Given their widely divergent theoretical understanding of social action, this corpus of literature is, as a rule, not convertible into methodological advice for survey researchers. All the same, it is illuminating as regards the concrete, empirical work that is done to achieve "standardization" and to carry on the work of interviewing successfully, in collaboration with the respondents, in the particular settings of the interaction – and this understanding may carry practical, although implicit or indirect, advice for practitioners (Houtkoop-Steenstra 2000). If any general conclusion can be drawn to serve the practical interests of the survey operator, it is that trouble arises when participants in interaction depart from regular conversational conventions (which may happen if strict standardization is enforced), and such trouble requires elaborate repair work if interaction is to go on.

A theory of survey interaction that conceives of respondents' answers as reflections of their inner states is not compatible with a general perspective on social action that privileges the interaction order (Warfield Rawls 2011; Warfield Rawls 1987); reciprocally, such a general perspective cannot accommodate a theory of the survey interaction that sees language as an expression of private thoughts. Therefore, two cells in Table 1 are empty. The middle column is the one of interest for me. The upper cell accommodates research that accepts the interactional co-authorship of survey answers, but still attends to the problem of measurement accuracy, conceiving of answers as ultimately describing the respondent. Such research often draws on the insights of Conversation Analysis, recommending practices of "conversational interviewing", in which operators clarify meaning and attend to possible contradictions and ambiguities as they occur in discussion (Conrad and Schober 2000; Schaeffer and Presser 2003; Schober and Conrad 1997; Suchman and Jordan 1990). The lower cell is the one I aim to explore in this thesis: a practice of survey-based sociological research that accommodates an interactional understanding of the survey interview and of social action and interpersonal interaction in general.

In the following pages I will discuss survey-based sociological research, highlighting its frequent affinity with individual-trait theories of social action (the IT – IT' cell in Table 1), while aiming to explore the possibility of an interactionally-aware use of this instrument (the IO – IO^1 cell in Table 1). I will present my research contributions in analyzing methodological debates in survey research on ethnicity and on public knowledge of science, and I will indicate their significance in opening a

possibility of a research agenda that employs surveys in a theoretical framework attentive to the interaction order (Warfield Rawls 2011; Warfield Rawls 1987).

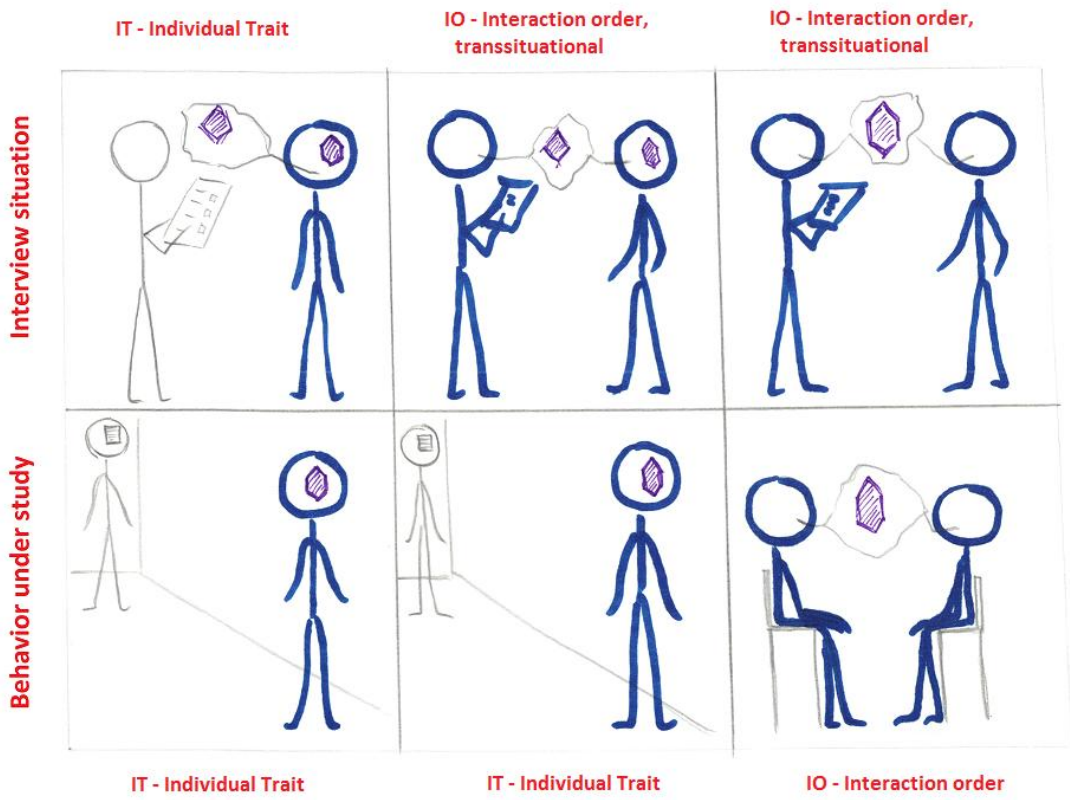
In Rughiniș (2007b) I have argued for the heuristic value of *analogy* in common reason and sociological thinking (pp. 63-70), and in this thesis I illustrate this point by a graphical representation (in Figure 1) and an analogy-based heuristic (see section 3.2.5). For what is worth, they have definitely helped me in elaborating this material, and I hope they will also be helpful in rendering the message as clearly intelligible as possible, for an audience with diverse theoretical orientations and substantive research interests. In Figure 1 I have sketched the main three theoretical approaches to survey-based sociological knowledge that I address in the following pages:

1) On the first column, I have represented the individual-trait theory of social action, together with the individual-trait theory of survey response;
2) On the second column, I have represented the slightly dissonant combination of an individual-trait theory of social action with an interactionally-aware theory of survey response;
3) On the third column, I have represented the combination that I aim to clarify in the present analysis: a consistent understanding of survey response and other forms of social action as fundamentally shaped in interaction.

Table 1. Overview of theoretical frameworks for survey practice in sociology

Theory of social action \ Theory of survey interaction		Respondent's answers are an expression of **individual traits** ("conduit view" of communication: answers describe respondents) **[IT']**	Respondent's answers are co-authored with the interviewer and other participants, in a concrete interaction situation (respondents and interviewers are participants in an **interaction order**)	
			Survey events have a **trans-situational** relevance Respondents' answers make intelligible other situations **[IO^1]**	Survey interviews have a situational relevance Respondents' answers are **highly situated** and do not make intelligible other situations Survey interactions may be studied as research topic **[IO^2]**
[IT]	**Individual traits** have a causal influence on individual actions - Traits are shared, and acquired in socialization	Main methodological concern: measurement accuracy (construct validity, reliability) Solutions include: - Questionnaire pretests - Standardization of interviewer actions and interview settings - Statistical procedures for managing errors and missing data	Main methodological concern: measurement accuracy (construct validity, reliability) Solutions include: - Questionnaire pretests - Meaningful conversational interventions of interviewers - Taking into account the interview interaction (eg: traits of the interviewer) - Statistical procedures for managing errors and missing data	
	Configurations of individual traits have a causal influence on individual actions - Social action is intelligible by linking it with types of actors - Types of actors are defined by the sociologist (ex: as clusters, latent classes)			
[IO]	Individual actions are performed and understood as category-bound - Social interaction makes use of publicly available categories of actors - Types of actors are available as a resource to members		Main methodological concern: representative design (relevance of the interview interaction for the life settings in which the topic under study takes place) Solutions include: - Questionnaire pretests - Meaningful conversational interventions of interviewers - Taking into account the interview interaction (eg: traits of the interviewer) - Adjusting data analysis and interpretation to the actual events that are available as evidence Shifts in analytical vocabulary: - Descriptive rather than causal - Acknowledges cross-sectionality - Types are preferred over traits	Survey interactions are analyzed as situated social interactions (in ethnomethodology, conversation analysis, discursive psychology) Surveys do not illuminate life in other settings.
	Individuals orient their actions to the situated **interaction order** - Individuals appeal to institutional orders and to accounts, as resources for situated interaction Individuals in interaction: a) Act as competent members b) Are oriented to interactional goals c) Act intelligibly and accountably			

Figure 1. Sketch of three alternative theoretical views of the interview situation in relation to the behavior under study



[IT-IT'] R.'s answers describe respondent's traits Interviewers are factored out R's action is influenced by these traits	[IT-IO[1]] R's answers are co-authored representations of traits R's action is influenced by these traits	[IO-IO[1]] R's answers are interactional achievements R's actions are interactional achievements

2.2 Checkpoints on the "trait" vs. "interaction order" divide

The views on the world afforded by "trait" theories of social action are very different from those afforded by interactionally oriented theories. Their vocabularies are widely divergent, pointing to irreconcilable ontologies. Survey-based social research is, as a rule, easier to conduct in light of a trait-based conception of persons and social action. Still, despite the instruments' strong theoretical inclination in this direction, I argue that there are forms and styles of survey-based research that may accommodate an interactionally focused approach.

A background question is, *why would one conduct a survey-based research, when working with an interactionally oriented theoretical perspective*? Indeed, a standardized interview applied to a large sample would most likely not be the research instrument of choice in this framework, unless one studies the interview situation itself. Still, there are cases in which an analyst may find surveys useful for the purpose at hand. Among others, survey-based research can afford:

1) Production of scale[2]: analysts obtain useful grounds for speaking about large numbers of people, often across a considerable territory and in distant social settings;
2) Typologies and classification: survey-based research is a powerful instrument for commenting on common-reason types, and for proposing revised and novel types as being relevant for understanding. In association with the power of statistically representative samples, surveys allow analysts to classify large numbers of people and to count membership in each category, and to compare types on various criteria; given the centrality of typification in common social knowledge, surveys have much to contribute to public knowledge precisely because they facilitate the production, counting, and comparison of types;
3) The production of reasonable certainty and uncertainty that can become basis for action, as opposed to incapacitating confusion; the quantitative vocabulary is a powerful rhetorical tool for communicating precision (even when precisely communicating imprecision), and it creates the possibility of strong, persuasive knowledge claims in the public arena;
4) Effective communication across the discipline: surveys are particularly useful tools for presenting evidence to public administration bodies, to various organizations interested in large-scale social processes, and to the general public; they offer a familiar vocabulary which gives analysts leverage in often unequally balanced relationships.

A second question then follows: how can a sociologist engage with survey-based research, while working under the auspices of an interactionally-oriented theory, in order to take advantage of their classification facilities and communicative force? Or, to put it in other terms: how can one work meaningfully with surveys, when attending to the creative and methodical work of participants in social interaction?

When looking for the answers already formulated, this inquiry highlights a rather fine zone of the methodological literature. Many starting points and pieces of advice are to be found in papers that are usually positioned as critical views of quantitative research - while still engaging with the

[2] This point was formulated by Puiu Lățea in an informal discussion on survey-based research.

enterprise and its intricacies. Such an undertaking may seem like riding two horses at once. As Hammersley (2010, p. 410) observes, in a paper that illustrates this type of inquiry,

> *While the problems surrounding measurement have often been acknowledged by quantitative researchers, they have usually been treated as technical in character; in other words as susceptible to remedy through further refinements in measurement technique (see, for example, Bulmer 2001). By contrast, critics have often taken these problems to indicate the folly of the whole enterprise. (…) So, the assumptions about the nature of social inquiry built into much qualitative research and much current social theory are at odds with any conception of social science that puts rigorous measurement at its core.*

The debate is indeed complicated because it rests on an 'assumptions war', on discussing the fundamentals that are taken for granted in order to make sense of survey results. When disagreeing with the basic tenets that justify the application and refinements of a method, it is difficult to engage in arguments on how to use it meaningfully. I believe that this is the place in the debate where it is useful to construct a scaffold that somehow spans the divides. Such a bridging structure is inescapably selective, focusing on some points of discontent at the expense of others. I propose several critical issues to orient the design of an interactionally-aware survey-based sociological research (see Table 2). These issues are linked to various forms of survey trouble, such as "errors", lack of respondent cooperation, and public controversies.

Table 2. Checkpoints on the "trait" versus "interaction-order" divide

Type of survey trouble	**Interaction processes that lead to this type of trouble**	**Survey-based solutions**	**Specific devices**	**Stage of survey research**
Contradictory answers Inconsistencies	Pragmatic orientation to the specificity of the interaction situation Regular methods of conversation-making: approximation, imprecision	Framing inconsistencies as **errors**	The **error-trait device**: Statistical techniques for dealing with error (aggregation, data reduction such as factor analysis)	Questionnaire design: scale selection or construction Statistical analysis
			The **error-practicality** device: re-focusing attention towards practicality (is measurement precision reasonable enough to be used?)	Data analysis, survey reports, scientific literature
			The **sampling error focus**: centering argumentation on issues of statistical representativity (addressed by statistical significance), at the expense of measurement error	Data analysis, survey reports, scientific literature

Type of survey trouble	Interaction processes that lead to this type of trouble	Survey-based solutions	Specific devices	Stage of survey research
Non-response "Don't know"	Mismatch between researchers' and respondents' structures of **relevance** or **propriety of conversation**	Conversational interventions to carry the interview to the end (accounts) Probing		Interviewing process
		Imputation techniques		Data analysis
Contested typologies	Using and commenting on common-reason typologies	Mixture of technical, ethical, theoretical considerations that favor a certain typology	Resonating typologies	Questionnaire design (choice of categories) Data analysis and reporting (category construction)

2.2.1 The error – trait device

As discussed above, many survey questions are designed and interpreted as measurements of individual stable traits, which are assumed to exist and, also, to be (quasi-)causally effective. The error – trait – cause triangle consists of the following three activities:

1) Looking for traits as relevant, agentive qualities of individuals;
2) Finding traits by operating with the *error device*, as detailed below, to decontextualize responses and attribute them to respondents;

The focus on errors is very important for the efficacy of this device; errors are a core concern in mainstream methodological texts on survey-based research. To illustrate the connection between the concept of error and the search for traits, I quote a definition of random measurement error – one of the basic topics of methodological improvements in survey research (Viswanathan 2010, p. 287):

> *In essence, a way to visualize random error conceptually is to examine whether inconsistent responses are provided across time (or items) when the phenomenon in question has not changed (such as an enduring trait). Some causes of random error include complex wording or language, questions requiring estimation, vagueness in questions or response categories (Churchill, 1979; Nunnally, 1978), the nature of administration through distracting factors and inconsistent administration procedures (cf. Churchill, 1979), and personal factors such as mood.*

This definition, which is a regular working instrument in a methodological discussion of improving measurement validity and reliability, opens up a series of questions from an interactional perspective in which responses are "inconsistent" only insofar an observer defines them as such, pragmatically (and, in conversation, rhetorically) by deciding that the *ceteris paribus* clause applies, here and now, and that responses *should* then be the same. The indicated "causes of random error" are a heterogeneous list, as regards their treatment under an interactional frame. The question is, what counts for the "sameness" of the "phenomenon", and the "consistency" of the "response"? For example, as regards wording, is the "same question" formulated with "different words" actually the "same question"? It is clear that, for some practical purposes, it is not – while for others it is. The practical purpose attended by survey analysts often consists of unveiling "enduring traits" beyond

"responses" that are taken to be relatively unstable. That these traits exist, that they are knowable and measurable (representing the 'true value' sought for), and that they are "enduring" is, as a rule, taken for granted. "Error" works as a rhetorical device that a) *decontextualizes* the contingent, situated survey response given by the respondent to the interviewee's question by comparing it to other responses, and b) *attributes* it to the respondent, as a stable attribute, with a byproduct of c) *uncertainty*. Overall, the "error" device converts *situated, methodical, open social interactions* into *stable individuals* known to us, the analysts, albeit with a *certain degree of uncertainty* (as represented in Figure 3).

Figure 2. The "error-trait" device in mainstream methodological treatment: decomposition of observed responses into true values and random errors

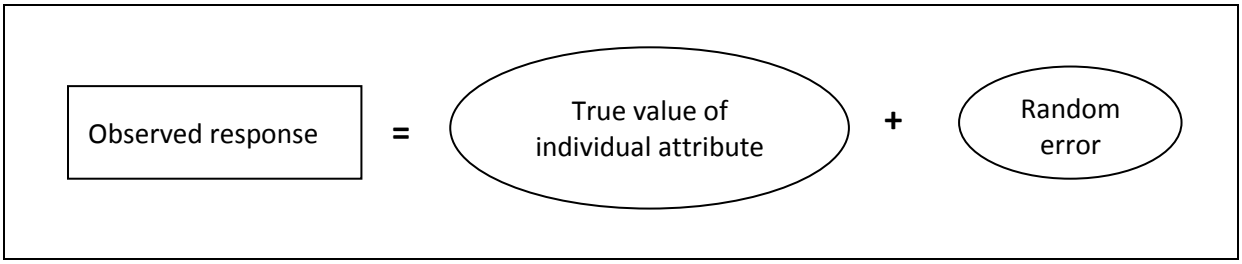
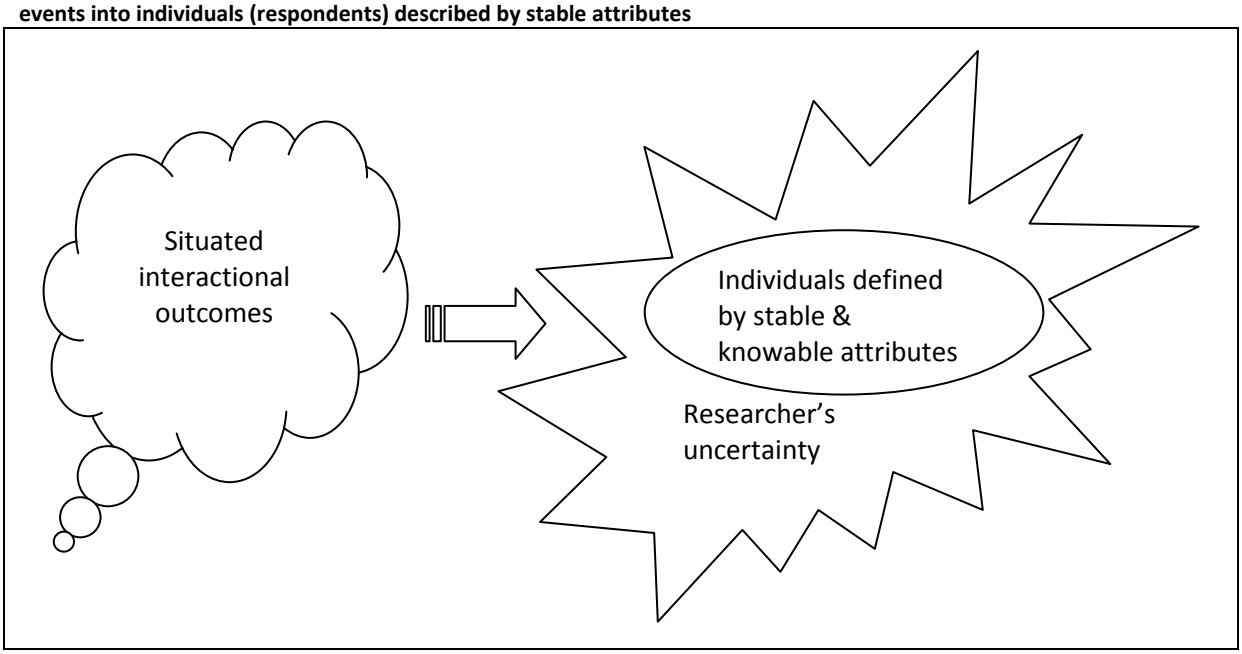


Figure 3. Working with the "error-trait" device from an interactional perspective: conversion of situated interactional events into individuals (respondents) described by stable attributes



2.2.2 Quasi-causes versus methods and resources

Traits are usually referred to as *causes or quasi-causes* for various outcomes (behaviors, other traits, resources etc); by quasi-causes I refer to the use of a causal vocabulary without a clear commitment to a causal epistemology. If ethnicity is reported to "influence" behavior or to have some sort of "effects", this represents an instance of a quasi-causal approach.

I propose that an interactionally oriented vocabulary may usefully replace such causal terms with a vocabulary of actions, methods, and resources. From this perspective, ethnicity may occasionally be invoked as a resource in interaction, and it may thus facilitate or hinder an interactional outcome. This move also supports a prudent take on nominalization in social research terminology, as convincingly advocated by Billig (2008).

2.2.3 Imposed relevance

From an ethnomethodologically informed perspective, researchers should be wary to impose their structure of relevance on respondents – by imputing them concerns or perspectives. For example, as regards social classification, any individual may be seen from an unlimited number of perspectives – by pointing out her gender, age, subcultural style, occupation, social class, beauty, ethnicity, and so on. In concrete, situated interactions, some of these classifications are brought out by members while all the others are ignored. Sociologists often re-describe actions by reference to categories that were not observably attended to by participants: for example, all sorts of interactions may be analyzed with reference to participants' gender, even if gender was not an observable concern for participants. There is a consistent debate as to what counts as an observable concern in interaction, whether some categories may be considered as omni-relevant or not, and what professional discretion the analyst has in choosing her analytical categories (M Billig 1999a; Emanuel A Schegloff 1999; M Billig 1999b; E A Schegloff 1999; Hammersley 2003; Potter 2003a).

In the context of this debate, standardized interviews cannot but impose a structure of relevance on the interaction and on analysis, since there is no possibility of observing the spontaneous orientations of members towards one another in the natural situations of interest. If a survey investigates the relationship between ethnicity and employment, there is no saying whether and how ethnic categories are actually invoked by participants in those work-related interactions that are presumably described, in the aggregate, by a correlation between ethnic affiliation and income or employment status. It is then the analyst's responsibility to justify the relevance of a certain classification – by demonstrating that in actual interaction situations that classification is used, by members, to orient their actions. If there is empirical evidence that ethnicity is relevant in recruitment decisions, this may be used to justify estimating a correlation between ethnicity and employment status, for example.

2.2.4 Resonating typologies

The relationship between members typologies and sociologists' classifications may be understood by reference to Schütz' distinction between first-order and second-order constructs (Schütz 1953; Kim and Berard 2009). This relationship, although fundamental for understanding social research as a social practice and as a form of knowledge, is relatively under-theorized, especially in survey-based research. The temptation of looking for clear-cut, comprehensive and mutually exclusive classes in second-order typologies, afforded by quantitative data, is at odds with an understanding of how first-order categories operate in social interaction:

> *"[C]ultural categories generally seem to operate on the basis of family resemblances, with people using prototypes or exemplars as a basis for determining what counts and does not count as an instance (…) So, a first problem facing attempts to produce classically rigorous classifications stems from the fact that, at some level, social research will always depend upon social scientists' ordinary cultural capabilities; that it may not be possible to explicate these fully in propositional terms; and that these practices depend upon flexible, context-sensitive categorization. Furthermore, the meaning of any cultural category is usually context-sensitive: what it includes, and does not include, depends upon the context in which it is being used, including the purposes it is serving. Not only will people interpret the same category in somewhat different ways according to circumstances, but also what level of clarity id required may vary in the same way. (…) The character of people's everyday categorizations has consequences for social science in a second way, too. This arises to the extent that, in order to describe and explain their behavior, we need to include in our*

accounts some representation of the categories that underlie people's discriminations among situations, differentiation across types of other people, identification of strategies available for use, and so on. And this is surely unavoidable in social science. The crucial point is that, if everyday categories have a flexible, fuzzy, context-sensitive, character, then we should not pretend that they can be incorporated into analytic categories that have an Aristotelian form: to do so would be to introduce distortion" (Hammersley 2010, pp. 418-419)

Not only that researcher' typologies are grounded in common reason distinctions and classifications, but they are continuously re-appropriated by common reason social thinking, crossing disciplinary boundaries. This raises an issue of anticipative design of second-order types: as sociologists, how are we to take into account the expected public reception and use of our constructed typologies? To what extent we can shape their re-appropriation by theoretically-informed decisions concerning data analysis and reporting?

3 Theorizing ethnicity in surveys of ethnic minorities. The case of research concerning the Romanian Roma / Țigani

In this section I will present the significance of my research contributions for an attempt to reposition survey-based sociological research in an interactional theoretical outlook. I start by presenting two alternative theoretical standpoints concerning empirical research on ethnicity; in order to clarify their practical consequences, I discuss an analogy that illustrates the interactional perspective on ethnicity; I then analyze their affinities with specific methodological choices in survey-based research.

3.1 Theoretical views on ethnicity

In the methodological literature dedicated to the quantification of ethnicity, there is widespread discontent concerning the links between theory and measurement. A series of recent contributions aim explicitly to address this mismatch (for example Aspinall 2001; C. W. Stephan and Stephan 2000; Aspinall 2009; Rughiniș 2011a; Rughiniș 2010; Burton, Nandi, and Platt 2010; Brown and Langer 2010; Phinney and Ong 2007). Solutions depend on the theoretical problems identified by the authors; still, there is unanimous appreciation that a categorical variable with several categories which the respondent can check does little service to a complex reality. Categorical measurements of ethnicity have two serious theoretical drawbacks (Brown and Langer 2010). On the one hand, they seem to support a primordialist view of the common reason variant that asserts ethnicity as membership in discrete, stable, essentially different groups with specific cultures. On the second hand, given that categories are often taken from administrative use, they serve to reinforce the very inequalities and power relations that they purportedly study.

The authors take three main directions when recommending solutions for a better fit of measurements with theories. The first direction, most often taken in relation to administrative measures, refers to "improving on categories": allowing respondents to self-identify, refining categories to reflect current usage, allowing for multiple affiliations, adding categories on other dimensions (Aspinall 2001; Stephan and Stephan 2000; Aspinall 2009). Secondly, there is the *internalizing* direction, which conceptualizes ethnicity as an identity construct and propose additional dimensions of the subjective experience of ethnicity, to be measured in addition to categorical affiliations (Rughiniș 2011a; Burton, Nandi, and Platt 2010; Phinney and Ong 2007). An illustrative example is provided by the Multigroup Ethnic Identity Measure – Revised scale (MEIM-R) (Phinney and Ong 2007), that includes the following items besides categorical self-identification, measuring the dimensions of 'exploration' and 'commitment' (p. 276):

> *1. I have spent time trying to find out more about my ethnic group, such as its history, traditions, and customs.*
>
> *2. I have a strong sense of belonging to my own ethnic group.*
>
> *3. I understand pretty well what my ethnic group membership means to me.*
>
> *4. I have often done things that will help me understand my ethnic background better.*
>
> *5. I have often talked to other people in order to learn more about my ethnic group.*
>
> *6. I feel a strong attachment towards my own ethnic group.*

Thirdly, there is the *externalizing* direction, which is considerably less studied in its implications for measurement. This approach sees ethnicity as a practice, rather than an individual attribute, and locates it firmly in interaction rather than within individual minds. Related theoretical developments have been formulated by Wimmer (2008), Brubaker (Brubaker 2004; Brubaker, Loveman, and Stamatov 2004; Brubaker 2002), Hale (2004) drawing on a substantial tradition that gained momentum after the seminal work of Barth (1969), who challenged the definition of ethnic groups as 'culture-bearing units' based on biological self-perpetuation, focusing on maintenance of social borders as the key definition of ethnicity (idem, pp. 10-15).

One key issue brought forward by this conception is that of the variable *relevance* of ethnic classifications: under what conditions, and how do people appeal to ethnicity to orient their interactions? From this perspective, ethnicity is only relevant when people make it relevant in interactions, displaying ethnic affiliations and orienting towards them. The issue of salience becomes the main empirical concern: how is ethnicity done, in social interchange?

The situational production and thus variability of relevance is of course a blind spot for the researchers who go around inquiring about ethnicity, since they actually bring it about by their very investigative orientation (Moerman 1974). Empirical research on the situated interactional constitution of ethnic identity is mostly conducted in the Conversation Analysis (CA) and its Membership Categorization Analysis (MCA) thread, and Discursive Psychology (DP) traditions that look at naturally occurring conversations and observes how participants methodically display their occasioned ethnic identities and orient towards them in action (Hansen 2005; Schilling-Estes 2004; Wilkinson 2011; Augoustinos and Every 2007; D. Edwards 2003). Surveys are definitely not the instrument of choice for inquiring into the salience of a particular classification, since they most often provide classifications for the respondents in closed-ended questions. Still, an attempt to use surveys to investigate the salience of particular ethnic categories, in the broader frame of discussions of ethnicity, is presented by Aspinall (2012), using open ended ethnic self-affiliation to inquire into ethnic "superdiversity". As regards aggregate measures of ethnic differentiation, mostly used within comparative politics and econometrics, a methodological proposal that attends to the issue of salience belongs to Chandra and Wilkinson (2008) who distinguish between measures of 'ethnic structure' and 'ethnic practice' (p. 523):

> *Ethnic structure refers to the distribution of descent-based attributes—and, therefore, the sets of nominal identities—that all individuals in a population possess, whether they identify with them or not. Ethnic practice refers to the act of using one or more identities embedded in this structure to guide behavior.*

A second important issue in understanding ethnicity as interactional resource concerns its occasioned use in *troubled interaction*. Ethnicity offers participants accounts of group differences, of divergent interests, conflicting cultures, of essentially different kinds of people – and such accounts and identity categories are particularly useful when interaction goes awry (Garfinkel 1945), becoming part of processes of Othering (Warfield Rawls and David 2006). Of course, not any interchange gone wrong elicits ethnic identification and attribution – raising again the issue of salience. Still, if this is put aside under the assumption (preferably based on specific empirical previous knowledge) that salience of ethnicity is high, in a specific social context, it makes sense to inquire into ethnicity as a correlate of social distance, segregation, and disparity. Such disparities offer structural opportunities for troubles interactions and, insofar as they are available in public

stereotypical accounts, they may become resources for dealing with them, often at the expense of the disadvantaged party.

Taking one step further, Brown and Langer (2010) propose to measure ethnicity (at aggregate levels) not in itself, but to include measures of ethnic diversity and ethnic disparity as indicators of social distance. The authors make this move aiming to address the theoretical inadequacy of categorical measurements in relation to current theorizing of ethnicity; their bold statement, which is worthy of detailed analysis in itself, is that:

> *[I]f we reconceive of ethnicity as an indicator of social diversity and disparity, the fact that the data we typically employ in the measurement of this indicator are neither as fluid nor as multidimensional as theorists of ethnicity qua ethnicity contend is less problematic because we take this as an issue of measurement bias and measurement error: bias, because the categories we use are acknowledged to be those legitimized by historical state practices; error, because the exclusive and exhaustive codings employed do not fully capture the nuance of ethnic identity. It may seem perverse to contend that some of the theoretical problems with measuring "ethnicity" are resolved by acknowledging measurement bias and measurement error, but our contention is that this is less problematic than reconciling "primordial" data with constructivist concepts. Measurement error and measurement bias are inherent features of virtually all quantitative variables (…) (p. 417).*

As a side comment, Brown and Langer's position is a telling illustration of a rhetorical *error-practicality device* (see Table 2): it literally makes theoretical problems fade away. In all fairness, the authors have also proposed a theoretical solution, basically by subsuming 'measured ethnicity' as an indicator of social distance, and refraining from treating it as an indicator of 'theoretical ethnicity'. The error device is brought in to make this solution work: a measurement with error may still be used, as a reasonable approximation for a task at hand, while an inadequate classification is at best useless and at worst undermining. Political bias is converted into measurement bias, while imposed relevance is converted into error due to nuance-conflation.

An interactional perspective on ethnicity does not preclude an interest in quantitative research on this topic. Such a theoretical stance keeps open an interest in ethnic inequalities, which are seen as a result of repeated social interactions that are oriented towards ethnic classifications; the ASA statement on The Importance of Collecting Data and Doing Social Scientific Research on Race is a clear formulation of such a research agenda (American Sociological Association 2003). The question arises, then, how can such a theoretical orientation be pursued with survey instruments. In order to address this question, I look at survey research and I inquire into its theoretical implications. Specifically, I discuss methodological debates, and technical discussions, and I ask what theoretical perspectives are (often implicitly) supported by alternative solutions.

In order to analyze the theoretical bearing of methodological discussions concerning survey research, I will explore the three critical issues that I have proposed as a scaffold: the error – trait device, the quasi-causal vocabulary, imposed relevance, and the use of resonating typologies.

3.2 Theoretical bearing of survey-based methodological discussions

3.2.1 The error – trait device in survey-based research on ethnicity

Ethnicity-related *variables*, the main unit in survey-based information production, are usually interpreted as ethnicity-related *attributes of the respondents* (or of higher order units such as groups, communities, as the case may be). Therefore, survey-based research affords easily an

interpretation of data as evidence for differences among individuals concerning their attributes. The social interaction that has produced the recorded answers is, as a rule, methodically erased by standardization guidelines and statistical analysis. Moreover, attributes are often considered to be stable across situations; that is, they are interpreted as stable traits. The question then arises, how can survey-based research accommodate an interactional perspective on social phenomena?

In relation to this distinction, we can classify theoretical perspectives on ethnicity in two broad strands:

A. Ethnicity as difference: ethnicity is a specific cultural profile of individuals, produced by socialization in an ethnic community
    - Ethnicity as a differentiation of humankind in essentially different, stable cultures:
        - Individual ethnicity as (public) membership in discrete, essentially different cultures;
        - Ethnic differences in patterns of actions or resources may be causally attributed to the influence of ethnicity on individual behavior;
        - It is often encountered in common-reason accounts of ethnic differences.
    - Ethnicity as socially (historically) constructed and ever-changing shared identities available to individuals in their life course:
        - Individual ethnicity as private affiliation to a community of cultural relevances;
        - Ethnic differences are a result of socially visible patterns of actions of people who affiliate with ethnic communities (ethnicization of social differences) – and may become relevant and thus influent in interaction.

B. Ethnicity as discursive resource for differentiation: ethnicity is invoked to make sense of, demand, and account for differentiated interaction
    - Ethnicity is a common-reason discursive resource for making sense of differences and troubles in interaction; ethnic categories and accounts of ethnic attributes are invoked in interaction in order to signal and manage boundaries, incommunicability; thus, ethnicity is not a cause, but a common-reason theory (with practical relevance) of social difference and distance.
    - Ethnicity represents a work of classification in inter-subjective boundary maintenance processes:
        - Individual ethnicity as outcome of inter-subjective classification processes;
        - Empirical concern: when do people invoke ethnic classifications?
        - People may orient to ethnic categories in interaction, or may attend to other classifications (ethnicity is not necessarily omnirelevant in action although some ethnic / racial classifications may be very often relevant);
        - Accounts of ethnic differences are invoked as resource in interaction - and may be thus reproduced or challenged in interaction and the locally produced accounts;

- Sociological research on ethnicity contributes to the common-reason production of accounts of ethnic differences.

3.2.2 Ethnicity as quasi-cause of action versus resource for action

In survey-based research employing ethnicity there is widespread use of a causal vocabulary, including expressions such as 'influence of ethnicity', 'consequences of ethnicity', or 'effects of ethnicity'. This vocabulary is widespread in epidemiology, and it is also present in social research within sociology, social psychology, or social work (see, for example, Wink 1997; Lott and Saxon 2002; Pellebon 2000; Connolly 2011). For what is worth, epidemiological uses of causal terms have a different grounding than those related with non-biological processes, since ethnicity is used as a proxy for shared heritage and thus for shared biological traits (genes or other configurations). The use of such expressions in sociological research does not necessarily mean that the authors adhere to an epistemological position that favors causal explanations in social theory, or that they see individual ethnicity as a causal influence. 'Influence of ethnicity' (in a different meaning from the influence of inherited biological traits) may refer, among others, to different processes such as:

- Causal influences of ethnically specific individual traits on behavior or other individual conditions, under a model that causally links behavior to mental states, including 'ethnic identity' or ethnically specific values, attitudes, beliefs etc;
- Results of social actions that orient towards ethnic classifications – referring to the social organization of ethnicity, and not to individual ethnic identification;
- Results of social actions that make use of resources which have been acquired in social processes that are oriented towards ethnic classifications – and for which, therefore, ethnicity has a 'second-hand' relevance.

The use of causally-loaded vocabulary is favored by particular statistical analyses such as regression and path models, which often rely on concepts as 'explanation' and 'effect' as part of the statistical jargon. It is therefore relevant to ask to what extent such technical terms are used with theoretical implications, and what sort of implications are favored by various styles of analysis.

An alternative vocabulary, supported by an interactional perspective, conceptualizes ethnicity as resource for action. To make use of an analogy, the distinction between 'influence on' and 'resource for' action is easy to make when asking about the relationship between happiness and money. Does money bring happiness? This formulation points towards the presence, or absence, of an influence of money on happiness – somehow irrespective of the person whose money or whose happiness is at stake. The vast body of conversations, quotes, humor, and other reflections on money and happiness is partly an indirect take on the agency that can bring about happiness: where is it located? In material structures? In personal capabilities – be they intellectual, spiritual, emotional, cognitive or of other kind, depending on the relevant classification? In interpersonal relationships? In broader, community and society-shaped processes? The rhetorical contrast of money and "buying" versus happiness is often used to point to human agency and interactional outcomes, against impersonal forces. An alternative rhetorical use of the money / happiness pair keeps money as a happiness-relevant fact but conceptualizes it as a resource, thus re-delegating agency to the actors who use this resource, and to their skills and orientations. A quote that illustrates this take on the distinction belongs, maybe ironically, to Henry Ford: "The object of living is work, experience, happiness. There is joy in work. All that money can do is buy us someone else's work in exchange for

our own. There is no happiness except in the realization that we have accomplished something" (quoted in Leagans 1964, p. 96).

We can therefore distinguish two broad perspectives and associated vocabularies concerning the relevance of ethnicity for understanding social action:

A. Individual ethnicity shapes actions in accordance with ethnic community values: it has an internally causal influence on behavior. Therefore, appropriate statistical analysis may include regression models in which effects of ethnicity are estimated by controlling for other influences (education, income, gender, age etc).

B. Individual ethnicity is used by participants in interaction to make sense of their different orientations and to account for interactional troubles. In this perspective, ethnicity is not a cause of distinctive behavior or of interactional conflicts – but it is an interpretive resource used to signal differences, to mark relevant aspects of the interactional context, and to account for the success or, often, the failure of the (inter-ethnic) interaction.

    - Individual ethnicity is displayed and used by participants in interaction to account for their actions; thus, ethnicity is continuously re-defined by differential treatment and different actions. Ethnicity is relevant for understanding interactional outcomes and it correlates with them, but it is not an internal cause of individual behavior; its force resides in its interactional deployment. It follows that ethnicity should not be reported as a cause of outcomes, but as a correlate of outcomes.

    - Ethnicity is used in interaction to represent types of people, jointly with other contextual elements (including individual attributes) that are available for participants; thus, ethnicity should be investigated in its interaction with other attributes to define types of persons. Therefore, it often makes no analytical sense to control for other variables in order to estimate the pure effect of ethnicity.

Table 3. Survey-based research on ethnicity under alternative theoretical perspectives on ethnicity

Issue	**[1] Ethnicity as shared attribute with causal influence on behaviour**		**[2] Ethnicity as shared concern and sense-making resource in interaction**	
	Ethnicity as membership in discrete cultures	**Ethnicity as identity: private choice of affiliation to communities of shared cultural relevance**	**Ethnicity as common-reason theory of social difference and social distance, as sense-making resource for dealing with troubled interactions**	**Ethnicity as occasioned, inter-subjective outcome of classification in interaction**
Observability	Ethnicity is **conspicuous**, public, and may be hetero-observed	Ethnicity is **private** and needs to be self-assessed	Ethnicity is an **inter-subjective classification** and it is best measured by both self-reports (ethnic affiliation) and hetero-reports (ethnic classification) in face-to-face interaction Differences between self-reports and hetero-reports are a relevant topic of study concerning the interactional organization of ethnicity	

Issue	[1] Ethnicity as shared attribute with causal influence on behaviour		[2] Ethnicity as shared concern and sense-making resource in interaction	
Type of measurement	-Categorical variable	-Categorical variable indicating (fuzzy) affiliation (with open and closed answers) - Labels may be multiple and overlapping -Dimensional variables indicating salience and strength of identification on various criteria	- Categorical variables with open and closed answers - Labels may be multiple and overlapping - Additional variables may include modifiers: certainty of classification for all those involved, ethnicity of family members, types of residential community	
General research questions	-What are the effects of ethnicity on behavior?	-How does ethnic identity orient actions in a variety of settings?	- What are the patterns of incommunicability, of difficulties in interaction that are associated with ethnic differences?	-How is ethnicity used by participants to orient in interaction and to account for their actions? -How is ethnicity accomplished in daily life?
Specific survey-based research questions	- What is the influence of ethnicity on behavior, controlling for other attributes?	-How does ethnicity correlate with various attributes that are publicly seen as relevant for ethnic distinctions? (ethnic gap models, identification of types of actors) -How do outcomes of particular interactions (where ethnicity plays an interactional role – such as employment, income, school grades) vary systematically with ethnicity independently of other attributes (ethnic discrimination models)	- What are the aggregated disparities associated with ethnicity, associated with specific settings of interaction?	-What types of persons are visible when taking ethnicity into account, together with other relevant attributes? -How do types of persons defined by ethnicity (uniquely or among other attributes) differ as regards attributes of interest (life chances, resources, vocabularies of motive, etc)?

3.2.3 Relevance of ethnicity: a blind spot of the survey interview

Surveys that include ethnicity as a variable and then report it in correlation with other attributes unavoidably assert the relevance of ethnicity for the social processes that have led to the reported attributes. This affirmation of the relevance of ethnicity represents a move in the very social process of ethnic differentiation. Survey analysts are therefore not detached observers – but active players in the social processes of ethnicization. In an interactional perspective, the most important attribute of any social classification is whether it is used or not in actual interactions. In a survey-based research there is no practical way to observe such an occasioned relevance. It is then the analyst's decision whether to report education, religiosity, voting as being related to ethnicity. It is important

to stress here that the issue is not whether voting behavior actually correlates with ethnicity. The issue is whether there are empirical reasons to believe that the specific voting behaviors that are described, in the aggregate, by survey data actually were made in light of first-order ethnic classifications. Any classification may be brought in the foreground, pushed in the background or ignored in a process of social interaction, and this is an empirically observable process. Reporting a correlation when there is no corresponding social process in which the two attributes were linked represents, in the parlance of causal analysis, a "spurious correlation" – an association that does not reflect patterns of meaningful interaction.

3.2.4 Ethnic typologies of the first and the second order

Ethnicity is a process of first-order classification: occasionally people orient to ethnic distinctions, act upon them and / or comment upon them. As regards the second-order classifications constructed by analysts to reflect ethnic identities or processes, they are closely linked with first-order distinctions in the large body of research that uses categorical measurements of ethnicity. This close coupling implies a process of selection: for example, researchers have to decide what particular labels to include and to exclude from the questionnaire. At the same time, these labels are going to be a subset of the labels people may use in daily life.

Although second-order typologies of ethnic identifications have been built by researchers that have proposed more elaborated, dimensional measurements of ethnicity conceptualized as identity, as discussed below, I have not seen instances of such work of re-conceptualization in research on Roma / Gypsy ethnicity.

3.2.5 A research heuristic: ethnicity as a classification based on astrological signs

In attempting to understand what difference does it make, in survey-based research of ethnicity, if we work under a subjective identity theory or an interactional theory of ethnicity, I found the following analogy to be useful: let us assume that, over the centuries, astrological signs have become common elements of conversation, allowing for self-presentation and attribution of personal traits in all sorts of settings, including Censuses, employment interviews, speed dating and so on. Let us further assume that, as analysts, we do not believe that celestial bodies and their configurations have any kind of influence on personality, behavior, or fate. That is, let us assume that we believe that astrology lacks any descriptive relevance or explanatory power whatsoever. We find ourselves in a situation in which a social classification is widely used in interactions, supporting accounts of compatible and incompatible personalities, proper and improper course of actions – and which is real in its consequences. The analogy is not farfetched if we think about biological theories of race, instead of ethnicity. The question is, then: what sort of survey-based research, and interpretation of evidence, is appropriate to investigate this phenomenon? This counterfactual scenario highlights the problematic use of several research operations:

a) The salience of astrological signs in social interaction would be of central interest: in which situations do participants make use of astrology to orient their actions and those of their partners'? When is astrology not invoked?

b) The issue of measurement error in measuring individuals' astrological signs by self-affiliation would become irrelevant. In those cases in which individuals would diverge in their self-affiliation from the hetero-attributed sign estimated by the interviewer, on the basis of their

date of birth and other observable marks, this divergence would be of primary analytical interest, and it would not be considered error or conceptual fuzziness.

c) In this scenario, an analyst that would correlate astrological signs with attributes that are not socially seen as relevant for astrology would find little justification for her research question and resulting coefficients. Also, typologies involving astrological signs would be of interest only insofar they are used in regular interaction to make sense of events and to guide behavior. Analytical relevance of types would be directly related to their social relevance. Non-related typologies would be considered analytical artifacts, without adding any insight in the social working of astrological signs.

d) The rhetoric of data analysis would carefully avoid causally-loaded terms (such as "effect", "influence" or "explained variance") – in order not to inadvertently support theories of the causal efficacy of astrological signs.

This analogy illustrates some of the main points of controversy between individual trait approaches and interactional approaches. Key issues concern the treatment of anomalies and absences, the attention to the minute details of actually occurring events, and an explanatory versus a descriptive interpretation of empirical associations.

3.3 Previous research contributions concerning survey-based sociological research on ethnicity

I will present several research choices in survey investigations of ethnic topics, in particular related to Romanian Roma / Țigani, discussing alternatively available solutions. My argument is that the technologies of survey design and statistical data analysis more often than not support a specific theoretic conceptualization of ethnicity – that is, ethnicity as a trait and a quasi-cause of behavior, functioning as a conduit of cultural difference in individual actions. In this understanding, ethnicity is a manifestation of structure and culture at work. I discuss how survey-based investigations may support a view of ethnicity as participants' sense-making resource for interaction (including troublesome interaction) – and the implications of such a theoretical standpoint for research design, data elicitation, analysis, and reporting.

3.3.1 Measurement of Roma ethnicity: hetero- and self-identification

In virtually all survey research on Roma / Țigani, ethnicity is measured with categorical variables. This practice has opened two debates, which are shared in other social contexts of categorical ethnic identification, in research and administrative settings as well: the issue of hetero- versus self-identification, and the issue of the most adequate categorical labels. Both of them have been scholarly concerns but also, and even primarily, common reason concerns of Roma and non-Roma people in all ways of life, especially participants in the larger public arena: state administration, politicians, non-governmental associations, media, other public figures, including academics, and so on.

The topic of hetero- and self-identification has been, in my experience and in my retrospective evaluation, one of the most engaging academic mysteries. More than ten years after the publication of the first survey-based research on Romanian Roma (E. Zamfir and Zamfir 1993), it was still drawing attention and inviting contributions and novel concerns (see for example the inquiry of Covrig, 2004 concerning the degree of deliberation in refusing to declare one's identity) or practical

solutions (such as Durnescu, Lazar, and Shaw 2002) . Before outlining my research contributions on this topic and their significance in the larger inquiry context which I have oriented to in this thesis, I will highlight the specific tensions of this problem, as they appear in survey research on Roma / Țigani issues.

The overarching frame of the methodological discussion concerning the use of hetero- and self-identification of ethnic categories consists in contrasting the two, and interpreting the resulting differences as forms of error. The discussion is, overall, one of self-identification *versus* hetero-identification – both of them being conceived as alternative forms of pinpointing the same phenomenon, namely the individual trait of ethnicity. The debate of hetero- versus self-identification of Roma ethnicity is a telling illustration of the functioning of the error-trait device. Empirical differences between the results of 'self-attribution' and 'hetero-attribution', in different interactional settings, are clearly observable and significant. By treating them as 'errors' the discussion can then proceed in technical terms, evaluating what procedure or combination of procedures is better suited for capturing the trait – instead of inquiring into the actual processes that lead to these different outcomes, and asking what sort of interaction is more similar to the ones that are of substantive research interest. It is taken for granted that these various types of interactional outcomes represent measures of the same phenomenon, that is individual ethnicity, which is an "enduring trait" of the respondent (Viswanathan 2010, in the quote discussed above).

From the point of view of the survey researcher, addressing this *error* issue is complicated and challenging, and a solution appears after juggling with theoretical, technical, common-sense and also ethical considerations:

a) Under the most frequently espoused theoretical perspective on ethnicity as identity, the actor is the one who has privileged access to her own ethnic identifications; *self-affiliation* is then the method of choice (Stephan and Stephan 2000; Rughiniș 2010);

b) At the same time, inter-ethnic encounters may involve conflicting claims and attributions of ethnicity, and the definition of the more powerful participant in interaction (such as a doctor versus a patient, or a state official versus a claimant) may orient more the result than the subjective actor's identity; *perceived ethnicity (hetero- attributed)* is thus a relevant variable in understanding distribution of wealth, health, education and other resources (Rat 2005);

c) As a matter of empirical observation, avowals of ethnicity are contextually dependent. This variability is translated into a question of uncertainty in measurement (Mateos, Singleton, and Longley 2009). Some researchers take it to reflect the fuzziness and complexity of the construct itself, especially in social contexts in which ethnicity has low salience (T. W. Smith 2008), while usually researchers frame it as a problem of *measurement error* that can be reduced, at least to some extent, by improvement on the adequacy of categories.

d) Avowals of ethnicity are also strategically oriented. Given the serious consequences attached to ethnicity or nationality, when stated in official contexts, people may not choose an affiliation which is considered stigmatizing or otherwise risky, such as the Roma / Țigan. This strategy of ethnic affiliation is translated into *measurement bias*, which is then treated as an obstacle to be overcome. The Roma / Țigan ethnicity is thus considered under-represented in Census and, possibly, in surveys – and the resulting technical orientation is that the techniques that produces more Roma respondents, within a general method (such

as self-affiliation), is the better technique. The associated theoretical commitment is that whoever may, in some contexts, declare themselves a Roma without joking, irony, or some other form of (intentional) lying, is to be considered as a member of the Roma population.

e) From a ethical point of view, given the essential uncertainty of an observer as regards the subjective self-definition of a person, in terms of ethnicity, religiosity, sexual orientation etc., hetero-identification represents an imposition; as Simon (2011) discusses in his review article, the United Nations Recommendations for Census collection of ethnic data insist that individuals should be free to declare or not their ethnicity, while the Framework Convention for the Protection of National Minorities[3], while acknowledging membership in an ethnic minority as an "objective" reality[4], also stipulates that "every person belonging to a national minority shall have the right freely to choose to be treated nor not to be treated as such" (Article 3);

f) A second ethical dilemma in ethnic identification concerns the use of racialized, pejorative categories in measurement. While researchers and a considerable proportion of the population may consider a specific appellative to be offensive or degrading, others may still identify with it – polemically, politically, or just simply so (Aspinall 2009). This is also the case for the ethnic appellative "Țigani", which has been at the same time heavily contested, and also used as a self-identification by some people.

g) Last but not least, the problem of hetero- versus self-identification features in public debates, in relation to concerns of finding the true number of Roma / Țigani, in relation to complaints about the difficulties of gathering data about them, and in anecdotes of communities where everybody is known to be a Țigan or Rom but, in the Census, there are only a few people.

This multifaceted resonance of the problem of hetero- *versus* self-identification makes it an enticing research puzzle. There have been two major types of research approaches in the literature on Roma / Țigani issues, which I have analyzed in Rughiniș (2010). One direction has been to study empirically the phenomenon of self- and hetero-identification of Roma / Țigani people, in Census and in survey settings. The second approach has been to take stock of difficulties as presented in the literature, frame them as a methodological challenge of reducing measurement error and bias, and propose a solution.

As regards Census self-affiliation, in Rughiniș (2010) I have reviewed a substantial amount of case study and survey evidence to discuss this issue, which I have framed as a "reluctance error". There is considerable evidence, especially from qualitative studies, of communities in which Roma identity is occasionally accepted, but whose members have chosen to self-identify as non-Roma in recent Censuses based on self-identification. In Romania, where Censuses were conducted in 1992 and 2002, mentions of such communities can be found, for example, in Briciu (2007), Grigoraș (2007) , Preda (1993), Șerban (1998), Voiculescu (2002), Salat and Veres (2009). In some cases, a majority of

[3] Available on July 23, 2009 on the Council of Europe site: http://conventions.coe.int/Treaty/EN/Treaties/Html/157.htm

[4] The Explanatory Report for the Convention adds (Para. 35) that "This paragraph does not imply a right for an individual to choose arbitrarily to belong to any national minority. The individual's subjective choice is inseparably linked to objective criteria relevant to the person's identity. Available on July 23, 2009 on the Council of Europe site: http://conventions.coe.int/Treaty/EN/Reports/Html/157.htm

the community members declared Roma identity in the Census, while in other cases only few of them did. Quantitative information from the UNDP 2002 dataset indicate that, in Romania, 80% of those who declare Roma ethnicity in the survey have also declared it in the 1992 Census[5]. The same dataset indicates considerable variability at national level, since rates of self-identified Roma range from 35% in the Czech Republic to 80% in Romania and Bulgaria.

As regards ethnic affiliation in survey settings, Ladányi and Szelényi (2001), Csepeli and Simon (2004), and Ahmed, Feliciano, and Emigh (2006) have analyzed diversity in hetero and auto-attribution, highlighting the socially contingent processes of ethnic labeling. Ladányi and Szelényi explored self-identification with Roma ethnic labels and hetero-identification by interviewers, using an "ethnic oversample", consisting of respondents who were hetero-classified as Roma by first-stage interviewers while conducting various samples at national levels. Authors have argued that hetero-identification is not a solution but an additional source of variability: from those people who were hetero-identified as Roma by the first-stage interviewer, only 71.7% were also hetero-identified as Roma by the second-stage interviewer (p. 86). The same data indicate little consensus between self-identification and interviewer hetero-identification: from the 368 respondents selected as Roma by survey interviewers, only 30.7% self-identified as Roma in the subsequent survey.

Hetero-identification by experts raises similar issues. The debate on hetero-identification has also covered the legitimacy of the use of hetero-attribution by Roma observers or local experts (Prieto-Flores 2009; Babusik 2004), and hetero-attribution at community level (Sandu 2005). Ladányi and Szelényi (2001) point out that, in comparison to interviewers, experts have detailed knowledge of "social problem" cases, and therefore if one were to select a sample based on their indications, it is likely that it would be biased towards the poorer households; experts may also have more detailed knowledge of ancestry, but it is unclear what their criteria are for categorizing people with ethnic labels based on information about the past.

In the Inclusion 2007 survey (Gabor Fleck and Rughiniș 2008; Rughiniș 2010) operators interviewed self-identified Roma heads of household but also an additional, randomly selected member of the household. While in some case the randomly selected member was the same with the head of the household, there are 548 random respondents which were different members of the household. 53 out of them, around 10%, self-identified with non-Roma ethnicities (Romanian, Hungarian, other). Since they lived in a household which had a member who self-identified as Roma, they belong to a population with a high probability of Roma self-identification – but they do not actually self-identify as Roma. Still, interviewers hetero-attributed Roma ethnicity to 32 out of the 53 persons, amounting to a proportion of 60%. Therefore, as we have seen before, interviewers may use contextual information to override individual self-identification.

There is a range of diverse approaches meant to link ethnic self-identification to hetero-identification as approximations of the same individual trait - either by designing the interview interaction, or by conceptual operations:

- In the Inclusion 2007 survey (Gabor Fleck and Rughiniș 2008) we have asked for a primary and a secondary affiliation, attempting to see what proportion of respondents would declare

[5] Unfortunately, since the UNDP survey was conducted in Romania in December 2001, respondents' answers refer to the Census in 1992 and not to the 2002 Census, and therefore may be influenced by information retrieval errors. Information about the UNDP survey period are available in the online rapport annexes at URL: http://roma.undp.sk/

a Romanian ethnicity and also offer a secondary Roma identity. In the comparative sample, out of 956 respondents, 4.7% declared a primary Roma ethnicity while only an additional 0.4% (4 respondents) declared a secondary Roma ethnicity.

- The UNDP survey, assuming a "reluctance error" in survey self-identification, proposed an "implicit endorsement identification" strategy. The interviewer approached the potential respondents, hetero-identified as Roma, with the opening question "Good morning/day, we are conducting a survey among the Roma population. Would you mind being interviewed?" Explicit rejection led to the cancellation of the interview, but acceptance was interpreted to mean that the respondent is Roma (UNDP - United Nations Development Program 2003). This method requires a leap of faith, since it is not clear whether acceptance of the interview really indicates an implicit acceptance of Roma ethnicity, or alternative reasons – such as politeness or misunderstandings. This dataset also indicates variability between national contexts. The proportion of selected respondents who explicitly rejected the Roma identity was 5% in Romania but 14% in Bulgaria.
- Durnescu, Lazar, and Shaw (2002) adopt a sequential approach in which they first ask for various information on the cultural background of the respondents, asking for explicit self-affiliation only at the end of the questionnaire;
- Székeli, Csepeli, and Örkény (2003) develop a classification of Roma ethnicity by combining respondents' ethnic affiliation with information about their ethnic background;
- In a community-level survey, Sandu (2005) refers to a population "which probably self-identifies as Roma" (p. 42), thus interpreting uncertainty as an epistemological attribute of the investigation, rather than a feature of the phenomenon of ethnicity.

In my methodological research on Roma-related surveys (Rughiniș 2011a; Rughiniș 2010) I have analyzed this central topic and its theoretical implications. From a theoretical perspective of ethnicity as identification with a community, contextual instability in declarations is easily interpreted as *error*. The problem becomes one of finding a way of access to true individual affiliations – which are subjective, but not arbitrary, and, therefore, are intersubjectively available to people with whom they interact on a daily basis, even if not for the researcher. In theory, access may involve establishing the trustworthiness of the researcher, deflecting reluctance to self-identify as Roma, or finding what closely involved partners of interaction know about the respondent's ethnic identity, assuming a certain degree of final uncertainty. Hetero-affiliation by socially distant observers, such as interviewers, remains to be used as indicator of another phenomenon, namely "perceived ethnicity".

Alternatively, if ethnicity is understood as an outcome of interaction, the problem of measurement error disappears. The question then becomes, what particular ethnicity is attributed by all participants based on their interaction, what sort of interaction what that, and what can we learn from this outcome that is of relevance for understanding other interactions. An apparently Roma person who declares a non-Roma ethnic identity is not, in this approach, a potential source of measurement error. Her specific answer to a specific question, asked by a specific person in a given situation, is to be understood as the very manifestation of ethnicity, the concrete instantiation of the operation of ethnicity in action.

From this perspective hetero-identification cannot correct or adjust information from self-identification; both of them, and their occasional differences, are relevant if they occur in interpersonal interaction, in order to understand the dynamics of the mutual classification process.

A secondary implication is that ethnicity that is self-reported under conditions of perfect anonymity, such as in postal surveys, is of less analytical value than ethnicity that is self-reported under conditions of face-to-face interaction, provided that we have a model of that interaction. If we are interested in ethnicity as it happens in daily conduct, then we are interested in its socially occasioned expression; self-presentations in postal surveys have little to tell by way of similarity with other, real life situations of self-presentation.

From an interactionally oriented theoretical perspective, a number of over one thousand personal encounters in which ethnic information is solicited and offered represent a potentially significant body of evidence. Still, the researcher would not be interested only in the final check on the box / boxes, but on the process in which this mark has been achieved – including steps such as: reaching the house of the respondent, negotiating entry, making a first impression as to the probable ethnicity of the respondent and the other household members that are present, asking the question about ethnicity, clarifying it, reacting to the answers, recording the answers. A detailed body of evidence on first inter-ethnic encounters in survey situations would offer potentially illuminating insights on the social efficacy of ethnicity as a classification available to participants in interaction, to be used for their own purposes.

3.3.2 Model specification and data analysis

Survey-based research on ethnicity and other forms of quantitative data that include ethnicity indicators afford estimates of average differences between categories of people identified by particular ethnic labels. What is the theoretical relevance of such differences?

In my research (Rughiniș 2011a) I have differentiated between three different research models concerning ethnicity. Firstly, 'ethnic disadvantage models' measure a given inequality in average access to resources or in risk incidence. Secondly, 'discrimination models' attempt to isolate the outcomes of ethnic discrimination from other sources of inequality, and to measure it. Thirdly, 'ethnic difference' models pursue the relationships between ethnicity and other social phenomena which are theoretically linked with the processes of ethnic differentiation. The three types are not mutually exclusive, because an ethnic disadvantage or a discrimination model may at the same time investigate a phenomenon which is relevant for ethnic differentiation. Also, what counts as a resource or a risk is a matter of normative choice: any feature assumed to be desirable may be analyzed from an 'ethnic gap' perspective – for example, wealth, education, health, but also consumption of a specific product, religious belief or participation, or adherence to a given tradition.

- The main focus of ethnic disadvantage and discrimination models is precise measurement, and a secondary focus may consist in the identification of other relevant predictors besides ethnicity. Control variables usually include socio-demographic features. While most ethnic disadvantage models do not control for subjective variables, such as values or attitudes, there is a growing body of research that connects ethnicity with Theory of Planned Behavior (TPB) models in diverse topics (Blanchard and et. al. 2003; Bryan, Ruiz, and O'Neill 2003) under the assumption that ethnicity explains shared beliefs, attitudes, or the perceived

norms of significant others, which are developed by socialization in social networks and communities which have a specific ethnic profile.

- Discrimination models using cross-sectional survey data confront a specific array of challenges. All relevant variables related to respondents' competences and respondents' preferences relevant for the outcome under investigation (such as income, employment, access to social services) must be controlled for, in order to identify unequal treatment. Since discrimination involves unequal treatment for persons who have the same relevant qualifications, the normative issue raises, what counts as a relevant qualification and what counts as an irrelevant, thus discriminatory, criterion. Therefore, as discussed in detail by Hanquinet and et.al. (2006, pp. 51-52), the use of multivariate analysis to measure discrimination is vulnerable to several sources of bias, including the 'omitted variable bias', when relevant controls are not included, the 'included variable problem', when some controls already capture variation due to discrimination, and the 'diverting variable bias', when controls include variables that should not be controlled, according to the normative concept of discrimination employed.
- Ethnic difference models range from simple models that trace differences between ethnic groups in language use or religious denomination, to complex models that explore influences of ethnic affiliation on intergroup attitudes, parenting styles, religious participation, conflict management, and so on. While in ethnic gap models ethnicity is usually measured as a categorical variable, used to chart unequal distributions of resources or risks across categories, in ethnic difference models the focus is on processes of ethnic delineation, also by including more complex measurements of individual ethnic identity.

Estimates of average differences between ethnic categories represent aggregate representations of quantified social phenomena. The theoretical relevance of such aggregates depends on:

- The criteria used for aggregation: whether it is an individual attribute or a set of attributes;
- The interpretation of the link between the differentiating criteria and the observed difference.

For example, regression models and more complex path or structural equation models afford estimating and reporting "direct effects" for all variables of interest, including ethnicity. Leaving aside the causal innuendo of the concept "effect", what sort of representation does this estimate offer? Direct effects of individual variables, such as ethnicity, represent an aggregation of differences across types of actors and situations of interaction, isolating the respective trait as a focus of analysis. From an interactional perspective such heavy aggregation makes little sense, as it bears virtually no link to any concrete situation of social interchange in which empirical instances of differentiated outcomes occur. If we estimate the direct effect of Roma ethnicity on school education, controlling for gender, generation, and type of residence, what type of life trajectory is this estimate referring to? What types of schooling (types of schools, types of parental support, types of collegial relationships within the classroom) are portrayed? What seems to be an analytically purified estimate of the influence (or relevance) of ethnicity becomes, in an interactional perspective, an analytical method of conflating social processes to the point of unintelligibility, or, in explanatory parlance, an instance of *amalgamated* models (Rughiniș 2007b, p. 221).

If aggregated quantified representations are to have any relevance for an interactionally-oriented research, they should be as closely related to a specific type of situation of interaction, a type that is distinctive and intelligible enough to warrant the assumption that it generates a typical course of interaction, which leads to the observed difference. To put it simply, ethnic differences constructed by quantitative aggregation should be interpretable as results of typical interactions in typical situations (involving typical participants). This links survey-based research directly to the epistemological problem of typification in social interaction and sociological research, and the criteria for the constructions of adequate typologies, following the line of inquiry opened by Schütz (1953) in his discussion of "Common sense and scientific interpretation of human action". Given the centrality and ubiquity of typification in common sense-making, the activity of sociological typification is not to be taken lightly: it is a core process of knowledge production, at once relying on common-sense methods and constructs, while attempting to introduce more clarity and understanding power (Kim and Berard 2009, p. 285):

> *Typification is simultaneously a scientific method, a commonsense method of perception and communication, a topic for the social sciences, and a theoretical insight which has since the sixties become a tried and tested heuristic for a tremendous variety of empirical studies across a variety of disciplines and literatures.*

4 Theorizing public knowledge of science in surveys of scientific literacy

4.1 Theoretical views on scientific literacy

In order to illustrate the specificity of survey-based sociological research on scientific literacy, it is useful to briefly review the theoretical development of the concept. Although surveys describe the general public, and thus speak about public knowledge of science, the concept of 'scientific literacy' has originated in education research, being particularly relevant for studies of science teaching and learning in schools. Laugksch (2000) discusses the long tradition of the concept of *scientific literacy*, having had a rich development in education sciences. However, it was after Miller's (1983) influential article in Daedalus that the concept gradually established its position in the sociological inquiry. Laugksch (2000) distinguishes between three "interest groups" within the scientific community that use the concept of scientific literacy. Firstly, there is the "science education community"; then, there are the "social scientists and public opinion researchers concerned with science and technology policy issues" (p.75). Apart from these, sociologists of science and science educators, who address scientific literacy sociologically, are interested in "how individuals in everyday life interpret and negotiate scientific knowledge" (idem). These three interest groups point to rather distinctive methods and audiences: science education studies focus especially on students and teachers, while the other two fields include various segments of the wider public. The Public Understanding of Science (PUS) field, to which I have referred in my research, relies extensively on surveys and media analyses with a quantitative methodology, while on the other hand there is a considerable body of in-depth, qualitative scrutiny of the ways in which science interweaves with people's everyday life.

In what follows I focus on the Public Understanding of Science approach, discussing the theory and measurement practice of the National Science Foundation (NSF) Scientific Literacy scale and its controversies with reference with the critical issues that I have outlined before: the error-trait device, the error-practicality device, treatment of scientific literacy as a quasi-cause, its relevance and its associated typologies.

The Public Understanding of Science research program has relied substantially on the conceptualization and measurement of "civic scientific literacy" advanced by Miller (1983). In this article the author proposed a concept of scientific literacy to be used in social surveys of the general public, relying on the distinction introduced by Shen, in 1975, between practical, civic, and cultural scientific literacy (apud Laugksch 2000, p. 77 and Miller 1983, p. 32). The concept refers to "a level of understanding of scientific terms and constructs sufficient to read a daily newspaper or magazine and to understand the essence of competing arguments on a given dispute or controversy" (Miller 1998, p. 204). More specifically, it represents a "minimal threshold level" of "understanding of science and technology needed to function as citizens in a modern industrial society" (Miller 2007b, p. 2).

Initially, Miller defined civic scientific literacy using three dimensions: an understanding of the "norms and methods of science", "cognitive science knowledge", and "attitudes towards organized science" (Miller 1983, pp. 32-34), which he subsequently refined as follows:

> *"(1) a vocabulary of basic scientific constructs sufficient to read competing views in a newspaper or magazine, (2) an understanding of the process or nature of scientific inquiry, and (3) some level of understanding of the impact of science and technology on individuals and on society" (Miller 1998).*

Most often, "scientific literacy" has been employed in quantitative research only with reference to the first two theoretical dimensions, the latter receiving less attention (Miller 2006a).

A first commentary on the conceptualization of scientific literacy is that its definition has a *pragmatic* orientation: it is a type of knowledge that allows people to "read competing views in a newspaper or magazine" and to "function as citizens in a modern industrial society", as indicated above. Therefore, it is a concept particularly suited to be conceptualized as a resource. The question is, how can we determine what types of knowledge are useful when reading competing views, or when living in a modern industrial society? And, moreover, are the two types of knowledge overlapping? This question seems to invite an empirical answer – one that presumably also depends on the particular society under study. Still, the survey-based conceptualization of scientific literacy has skipped these questions and it has proposed a measurable concept that has no obvious link to either of the two practical uses to which it was theoretically assigned. Nor have there been empirical investigations to discuss, a posteriori, whether the operationalization is adequate in light of its initial definition. The measurable construct has been implicitly defined as a stable individual trait, with trans-situational relevance, being also deemed comparable across countries.

In Table 4 I have summarized the terminology employed to refer to the public knowledge of science. It is generally referred to as a type of "knowledge", a cognitive dimension, and, with the exception of Miller himself, the "vocabulary" concept is not used. We can see here how the initially proposed definition could accommodate an interactionally oriented operationalization, if scientific literacy were defined as the "mastery of a vocabulary of scientific constructs that allows for meaningful conversation on scientific topics in given context". A standardized form of such a conversation could then be included in a questionnaire. The measurement model for a vocabulary would then rather be topic-specific, for example concerning antibiotics, or smoking, or astronomy etc., and would rather be formative than reflective (see the comparison below in section 4.3.2.1), focusing on several constructs of particular thematic interest.

Table 4. Terminology used in referring to the "knowledge of scientific constructs" dimension

Key concepts	Source	Term	Page
Knowledge about science	(Nick Allum, Sturgis, et al. 2008)	"public knowledge about science and technology" "basic "textbook" knowledge about science" "knowledge about scientific facts and processes" "knowledge about science"	35-37
Knowledge Facts	(M. Bauer 2009)	"knowledge of basic textbook facts of science" "factual knowledge"	223
Knowledge Facts	(Godin and Gingras 2000)	"knowledge of S&T facts"	52
Knowledge Concepts Scientific knowledge Knowledge about science	(Hayes and Tariq 2000)	"scientific knowledge" "knowledge and understanding of some basic scientific concepts" "knowledge of science"	433-434
		"correct knowledge of scientific matters"	435
Knowledge Constructs	(Miller 1983)	"Cognitive science knowledge" "Knowledge of basic scientific constructs"	34

Key concepts	Source	Term	Page
Vocabulary Constructs	(Miller 2006b)	"basic vocabulary of scientific terms and concepts" "construct vocabulary"	2-3
Vocabulary Constructs	(Miller 1998)	"vocabulary dimension of basic scientific constructs"	206
		"construct vocabulary dimension"	209-210
Knowledge about science Facts	(National Science Board 2008)	"factual knowledge about science"	Chapter 7
Knowledge Scientific knowledge Comprehension	(Pardo and Calvo 2004)	"cognitive dimension of public perceptions of science" "scientific knowledge of the 'know-what' type" "appropriation of scientific theories of the world"	203-204
		"comprehension of central concepts and propositions about the natural world"	205

In my work I have focused on the first component in Miller's definition, the "vocabulary of basic scientific constructs", which has also included in its operationalization the construct of evolution, to which I pay special attention. I refer to this vocabulary whenever I use the concept of "scientific literacy". I employ the concise expression "scientific literacy", rather than "civic scientific literacy", while keeping in mind the concept's definition as a citizen's skill for participation in public debates and, implicitly, in conversations, and the focus on the vocabulary dimension.

4.2 Theoretical bearing of survey-based methodological discussions

4.2.1 Scientific literacy as a trait

Resulting from collaboration between Miller in the United States and Thomas and Durant in the United Kingdom (Miller 1998b, p. 207; Nick Allum, Sturgis, et al. 2008, p. 38), the scale used to measure scientific literacy includes several items assessing knowledge of scientific constructs. The initial version has been reduced for the use of the National Science Foundation (Bann and Schwerin 2004). Eurobarometer surveys have employed it as well, for example in the 63.1 / 2005 questionnaire (TNS OPINION & SOCIAL 2005a) as presented in Figure 1.

Figure 4. The scientific knowledge quiz included in the Eurobarometer 63.1 / 2005 questionnaire. Source: TNS OPINION & SOCIAL (2005, p. 14)

QA10	Here is a little quiz. For each of the following statements, please tell me if it is true or false. If you don't know, say so, and we will go on to the next one.

(SHOW CARD - ONE ANSWER PER LINE)

	(READ OUT)	True.	False.	DK
1	The Sun goes around the Earth	1	2	3
2	The centre of the Earth is very hot	1	2	3
3	The oxygen we breathe comes from plants	1	2	3
4	Radioactive milk can be made safe by boiling it	1	2	3
5	Electrons are smaller than atoms	1	2	3
6	The continents on which we live have been moving for millions of years and will continue to move in the future	1	2	3
7	It is the mother's genes that decide whether the baby is a boy or a girl	1	2	3
8	The earliest humans lived at the same time as the dinosaurs	1	2	3
9	Antibiotics kill viruses as well as bacteria	1	2	3
10	Lasers work by focusing sound waves	1	2	3
11	All radioactivity is man-made	1	2	3
12	Human beings, as we know them today, developed from earlier species of animals	1	2	3
13	It takes one month for the Earth to go around the Sun	1	2	3

In order to measure the vocabulary dimension of civic scientific literacy, an important question had to be addressed: which are the scientific constructs to be included in the measurement? This process of selection is documented in several papers (Durant, Evans, and Thomas 1992; Miller 1998; Miller 2007b). Firstly, Miller (2007c) advances the central criterion of *durability* that distinguished "basic constructs" considered foundational in understanding current issues, like atomic structure or the DNA, from "specific terms, such as the fallout of strontium 90 from atmospheric testing". In an account of the elaboration of the Oxford Scientific Knowledge Scale, Durant, Evans, and Thomas (1992, p. 165) invoke *difficulty levels* and *disciplinary fields* as criteria for the selection of items in the quiz[6]. Later, the authors defined the scale as measuring the understanding of 'scientific product', through which they meant:

> *"[T]he elementary theoretical and factual findings of science – for example that light travels faster than sound, that diamonds are made of carbon, and that sunlight can cause skin cancer. The 23 items used to measure this dimension were drawn from a wide range of natural and medical sciences (…)* (Evans and Durant 1995, p. 58).

In addition to these criteria, the scale had to pass analyses of internal consistency and dimensionality (Miller 2007c, p. 4; Durant, Evans, and Thomas 1992, p.179). For instance, when elaborating the shorter version of the NSF scale, Bann and Schwerin (2004, pp. 4-5) examined the distribution of the items across content areas, the dimensionality of the scale, as well as psychometric properties of

[6] *"In the domain of knowledge, our aim has been to assess levels of acquaintance with the factual and theoretical content of science. After careful piloting, we established a suitable level of average difficulty for items in this area (…). Our knowledge quiz comprises more than 20 simple propositions covering the fields of physics, chemistry, geology, and the bio-medical sciences".*

individual items within an Item Response Theory model, focusing on item difficulty and item discrimination.

To summarize, the constructs included in the Oxford and NSF scales to measure scientific literacy had been selected from medical and natural sciences, such as to be fundamental in science, and therefore durable, and to cover an empirically appropriate spectrum of difficulty for respondents. Items have also been examined in their relation with the overall scale, by examining the Cronbach Alpha reliability and the dimensionality of the scale, and Item Response Theory parameters.

The selection of fundamental, elementary, "textbook" scientific constructs has been accomplished by scientists with reference to scientific criteria of what "elementary" means. Respondents' experience with scientific constructs had only been introduced in the selection process through the evaluation of item "difficulty", that is a statistical estimate based on the probabilities of a correct answer. Because the selected scientific constructs are fundamental from scientists' perspective, they are considered to be similar topics of knowledge for lay people. Once introduced in the scale, the difference between lay representations of various scientific constructs is measured, rather than investigated. More precisely, it is statistical estimates such as Cronbach alpha reliability, factor loadings, and IRT difficulty levels and discrimination powers that are employed to express, evaluate and control construct heterogeneity.

4.2.2 Relevance and typologies

The Public Understanding of Science research thread, in which I have positioned myself, is highly reflexive and there has been a rich body of work in theoretical and methodological reviews (such as Bauer, Allum, and Miller 2007; Bauer 2009; J. D. Miller 2007; Vlăsceanu 2011; N. Allum et al. 2008; Pardo and Calvo 2004). The field is also not free from longstanding controversy. Most of the debates can be traced to issues of relevance and to contested typologies. The two are related, as the argument goes: irrelevant tests of knowledge are said to assist in a classification of people into worthy scientists and to-be-educated lay people. An illustration of this joint critique is formulated by Fayard (1992) in his memorably titled article "*Let's stop persecuting people who don't think like Galileo*!":

> *"Throughout history the tables have constantly been turned, with yesterday's victims becoming today's persecutors. This is why, peering into the cradle of Public Understanding of Science, I would like to make the following plea (even if it's only wishful thinking): let's stop persecuting people just because they don't think like Galileo! We are told, for example, that many people do not know that the Earth goes round the Sun. I confess that I myself have never woken up in the morning saying 'the movement of the Earth on its axis is such that the Sun can be seen in the east'- in my daily life the Sun moves round the Earth. (…) The question is: how does a venture in the public communication of science and technology see its public? As empty vessels to he filled, as warped minds in need of straightening out, as citizens with whom to enter into dialogue, or as taxpayers to be convinced of the necessity of funding research?" (p. 15).*

The "ignorant public" has been the target of critiques directed against the "public deficit model" of inquiry, a style of research that measures public scientific literacy, thus allowing for a classification of publics into more or less literate, and implicitly focusing on individual knowledge (of a declarative kind) as indicator of civic competence. This focus also directs attention to the public, assigning ignorance as an individual attribute. Following debates, this approach has been replaced by a "science and society" orientation, focused on trust deficit, expert deficit, confidence crisis, and

elaborated notions of science's publics (Bauer, Allum, and Miller 2007, p. 80). Nevertheless, despite significant discussion focused precisely on what was understood to be an impoverished representation of people in their relation with science, the methodological operations involved in measuring and interpreting scientific literacy in the general public are still (unwittingly) reproducing the same deficit orientation – insofar that knowledge of scientific constructs is located within individuals. People are thus classified as being more or less knowledgeable, in reference to a body of knowledge that is authoritative and external to them.

The theoretical line of alternative conceptualization of public knowledge of scientific constructs locates it interpersonally and institutionally, in the multiple social settings in which people actually conduct their lives. Scientific literacy is thus conceptualized as "collective praxis" (Roth and Lee 2002). Ignorance of scientific concepts is no longer construed as an attribute of individuals, but as a possible outcome of various types of engagement and disengagement with scientific institutions. Ignorance of radioactivity-related constructs in the setting of a nuclear fuels reprocessing plant is seen as the outcome of the socially and organizationally required trust in the expertise of organizational scientists; therefore, ignorant people are shown to be competent social actors, effectively attending to their contextually legitimate concerns:

> *Having arranged several discussion groups with apprentice fitters, plumbers, electricians and others, and having prepared a series of questions exploring their understanding of, for example, the different properties of alpha, beta and gamma radiation and the different protection measures they required, we were dumbfounded to find a version of the same passivity we had found elsewhere. Not only this, but the workers defended their ignorance vigorously. We eventually realized from their explanations that they were intuitively the competent sociologists, and we had been operating with very insensitive assumptions. In effect they were saying that as employees in a large and hazardous industrial complex they had to engage in disciplined work procedures and detailed operational rules which should have the best scientific understanding of radiation hazards built into them. Scientists and engineers in the firm and its surrounding regulatory bodies had designed these rules, and workers had to trust that they had done so competently, just as we have to trust that the local garage bas serviced our car brakes properly* (Wynne 1992, p. 39).

Ignorance of something is therefore investigated as an activity – which may involve orientation to other structures of relevance, and even concrete and strategic actions of ignoring, obfuscating, refuting and rejecting knowledge – as illustrated by Desantis (2003) in his account of ignorance of the negative health effects of cigar smoking, or by Auyero and Swistun (2008) in their research on residents' uncertainty about the reality, causes and effects of local pollution.

4.3 Previous research contributions concerning survey-based sociological research on scientific literacy

4.3.1 The error-trait device: scientific literacy as vocabulary, worldview, or trait

The continuous advance and consolidation of the Public Understanding of Science research program during the last three decades, and the recent public controversies on the use of evolution as an indicator of scientific literacy (Bhattacharjee 2010) allow us to examine, in retrospect, the implicit theoretical assumptions that underlie the substantial body of research employing the NSF scientific literacy scale.

Pardo and Calvo (2004, p. 204) identify as the main, foundational presupposition of the PUS research program the idea that lay resistance to scientific rationality is mainly due to prejudice, reinforced by traditional constructs, and that this resistance gradually fades away as a result of dissemination of knowledge by schooling and popularization programs. This idea has been translated into the hypothesis that scientific literacy, as measured by the Oxford or NSF scales, is positively associated with attitudes towards science - a hypothesis that has been extensively evaluated (see for example M. Bauer 2009; Nick Allum, Sturgis, et al. 2008).

Shifting the viewpoint of assumption analysis, we can identify a similar framing within the process of operationalization and measurement of scientific literacy: when it comes to science, to know her is to love her – or, at least, to believe in her. More specifically, the NSF and Oxford scientific literacy scales rely on four presuppositions. Firstly, it is assumed that *all fundamental scientific constructs are similar objects of knowledge for lay people*. Secondly, there is the idea that *a reasonably attainable level of lay understanding of scientific constructs leads people into believing in the scientific facts with which these constructs are mutually constitutive*. That is, familiarity with the vocabulary of science develops concomitantly, and is intrinsically linked, with a personal appropriation of the scientific knowledge about the world. The third assumption is that *each adult individual has a relatively stable and trans-situational disposition to understand scientific constructs to a certain degree*. In other words, some people have a higher disposition towards correct understanding, and other people have a lower disposition. Finally, the fourth presupposition is that *this disposition is a form of knowledge or ability*. The operationalized concept of scientific literacy represents exactly this ability of an individual, which assumingly underlies one's beliefs in all textbook scientific facts.

In fact, all these four assumptions represent arguments that can be evaluated empirically: (1) that there are similar ways in which lay people get acquainted and develop their knowledge of various textbook scientific constructs; (2) that understanding of scientific constructs is strongly conducive to believing in their existence; (3) that each individual has a stable, trans-situational disposition to understand (and thus, according to the second assumption, to believe in) elementary scientific constructs, and (4) that this disposition is a form of ability or knowledge, which may adequately be termed "literacy".

At a yet lower level of methodological analysis, there are other assumptions which have remained under-evaluated, and which I also do not engage. For example, incorrect answers to quiz items are routinely aggregated with "don't know" answers, although the two represent different respondent behavior and interaction outcomes (M. Bauer 1996, p. 43). The resulting dichotomous quiz variables are handled on the presupposition that the unobserved variable of scientific literacy is best modeled as a continuous numerical variable (a dimension), rather than a discrete numerical, an ordered, or a categorical one.

An examination of the evolution item in the NSF scale is useful for understanding the theoretical relevance and empirical value of the four conceptual presuppositions outlined above. For example, this inquiry points out that familiarity with scientific concepts often leads to the acceptance of related scientific facts, but sometimes it does not. It is especially the case when those scientific facts conflict with matters of importance for people's lives.

Common sense or vernacular knowledge (W. Wagner 2007) of scientific facts is constituted in diverse life situations, and is put to use in conversations and other actions that have highly variable meaning and importance. This practical significance explains the radical discontinuity between

scientific knowledge and common-sense knowledge (W. Wagner 2007; Schütz 1953), and the divergent lay representations of scientific constructs too. For example, the lay understanding of those "genes" that determines the sex of a baby may not be the same as for the "genes" from a genetic disorder, or for the "genes" from a genetically modified tomato – and it may only have a slight family resemblance with the scientific understanding of the "gene" construct. Therefore, people's experiences with fundamental scientific constructs are heterogeneous: some constructs matter more, and in different ways, than others do. In order to account for people's representations of a scientific construct it is essential to observe the institutional settings in which they learned of it (Vlasceanu 2011, p. 559) and otherwise dealt with it. Furthermore, belief in contested scientific facts may derive not only from knowledge of science, but also from other individual dispositions, such as trust in the cognitive power of science, or appreciation of the effects of science.

Therefore, the first presupposition outline above holds *only with reference to a subset of the scientific constructs included in the scale*. This subset consists of those constructs that are of no practical consequence for the daily decisions of adult respondents, being limited to encounters in contexts of formalized education, such as natural sciences classes, or through other media, possibly documentaries, museums, and other channels of science popularization. I have referred to these constructs as *quiet*, contrasting them with the *animated* constructs, which people encounter, confront with and rally to in important life situations.

Of course, it is a matter of empirical analysis to identify in a given public the quiet scientific constructs that are acquired in school-like settings, and to identify situations in which such settings occur after graduation. Still, it seems that many constructs in the NSF scale (such as the center of the Earth, oxygen, lasers, electrons or continents) match this acquisition profile for diverse publics, thus accounting for the overall empirical value of the instrument according to survey-based methodological criteria.

At the same time, any animated construct that is experienced by adult people in their consequential everyday life situations has the potential to expose the three assumptions. Firstly, a clear lay understanding of the construct may not be strongly conducive to a belief in all scientific facts associated with it. Then, a belief in the construct may not reflect a stable, individual disposition shared with other scientific constructs; that is, individuals come to know it and believe in it in situationally specific ways. Lastly, if there is a stable disposition that influences individual belief in this construct, it is not necessarily knowledge of science, but rather appreciation of science, or trust in science. Through these animated items, which have a different social life than their quieter counterparts, it is possible to trace back and better grasp some of the occasional problems with scale items and its overall functioning.

4.3.2 Understanding trouble in the quantification of scientific literacy: three possible distinctions

There are several points of trouble in the literature dedicated to the Public Understanding of Science research thread: a) the internal coherence of the scale is not very high; b) some constructs in particular are troublesome, especially evolution – which, in the United States, has a weak correlation with the general factor extracted from the scale (Miller 2007b, p. 5) while, in addition, its inclusion is also publicly contested (Bhattacharjee 2010); c) there is some discussion of the self-assumed ignorance ("Don't know" answers) concerning scientific constructs, but this was not followed by an analysis of these responses, with the exception of M. Bauer (1996).

My analysis of these debates indicates that they can be understood by introducing two main distinctions:

a) Between reflective and formative measurement models: scientific literacy is usually considered to be measured under a reflective model; still, a formative model may be more adequate if there is a particular theoretical interest in specific constructs that are weakly correlated;

b) Between quiet and animated scientific constructs: a reflective model may be used only with constructs that have similar learning and use contexts; this is not the case with the animated constructs, such as evolution, which are embedded in heated interactional situations.

4.3.2.1 Distinguishing measurement models: reflective and formative

The theoretical affinity of measurement models

A measurement model presents the relationships between an operationalized concept and the observed values of measured indicators (Billiet 2010). For example, the measurement model allows us to derive values for the unobserved operationalized concept, also called the latent variable, from the observed values of a questionnaire quiz. At the same time, the operationalized concept is not valuable in itself, but only in relation to the theoretical concept that it claims to represent (Saris and Gallhofer 2007, pp. 15-29).

In survey-based research of public knowledge of scientific constructs, scientific literacy is a theoretical concept, defined as the capacity to understand competing scientific arguments as presented in newspapers and political debates. It has been operationalized as the respondents' ability to answer correctly survey questions on fundamental scientific constructs; this individual ability is not directly observable, and therefore it represents a latent variable. The quiz items in the NSF scale are its indicators, and respondent answers to these items are directly observable.

Methodologically, reflective measurement models differ from formative ones in terms of the relationship between the unobserved operationalized variable, and the observed indicators. In reflective models, the observed indicators are considered to be effects of the latent operationalized variable, while in formative models the relationship is somehow reversed: the operationalized variable is understood as resulting from the observed indicators (Bollen and Lennox 1991).

Interpretation of items is different by design between the two models. In a reflective model, the correlations between the true values of the indicators are theoretically assumed to derive from their shared causation by the latent variable. Unless additional, external variables exercise some other shared influence on the indicators, the items are not expected to covary when the latent variable is controlled for. Also, in a reflective model items are understood as essentially replaceable by other similar items: the scale includes a sample of the theoretically expected effects of the latent variable. Practically, indicators in a reflective model are interpreted as *alternative measures* of the underlying latent variable.

On the contrary, in a formative model the observed variables may, or may not correlate when the latent variable is controlled for, since they are its *components* or its *causes*, not its effects. Each and every observed item is considered to be an essential and irreplaceable part of the model, and the meaning of the latent variable changes if an item is added, removed or replaced. The overall satisfaction with a product, measured in market research, is a typical example of a concept that may

be operationalized in a formative model, when defined as the result of multiple judgments of specific product features. Another concept which is conveniently measured with a formative operationalization is the socio-economic status (SES) defined as "a combination of education, income, occupation and residence", as exemplified by Diamantopoulos and Winklhofer (2001, p. 270): "[i]f any one of these measures increases, SAS would increase (even if the other indicators did not change); conversely, if a person's SES increases, this would not necessarily be accompanied by an increase in all four measures" (idem). Formative unobserved constructs consist or derive from configurations of heterogeneous and possibly uncorrelated attributes, which in turn may function as indicators for the presence of the construct. With regard to the public engagement with science, a person's adherence to a scientific worldview may be modeled as an outcome of her judgments about a series of significant scientific constructs.

J. R. Edwards and Bagozzi (2000) and Borsboom, Mellenbergh, and van Heerden (2003) present edifying discussions of the relationships between operationalized variables and their indicators under the two measurement models. The choice of a measurement model is theoretical, depending on the correspondence assumed to exist between observed and unobserved variables of interest.

Generally, reflective models are much more frequent than formative ones. A possible reason may be that it is easier to think of unobservable causes of observed effects, than of unobservable effects or configurations of observed phenomena. There are also statistical reasons, such as the fact that the formative model is always under-identified and needs to be inserted into a larger model in which the operationalized variable acts as a predictor for a dependent variable. For example, one may explain attitudes on genetically modified foods by adherence to a scientifically informed worldview about life, which is measured formatively. The formative model parameters are then estimated simultaneously with the causal influences of the latent worldview on the dependent attitude. This dependence on a predicted variable raises theoretical questions about the meaning of the formative latent variable. Heise points out that a formative variable "is the composite that best predicts the dependent variable in the analysis .[…] Thus, the meaning of the latent construct is as much a function of the dependent variable as it is a function of its indicators" (1972, p. 160, quoted in J. R. Edwards and Bagozzi 2000, p. 159). Although it may seem to introduce an uncomfortable instability in the structure of the operationalized concept, this dependence on the predicted variable actually reflects the pragmatic value of judgments of all kinds, which are often formulated for a task at hand, and not *in abstracto*.

The underlying reflective model of scientific literacy

Research practice generally inquires scientific literacy within reflective models, without usually addressing the choice of measurement models, which remains implicit. The operationalized knowledge of scientific constructs is understood as the respondents' ability to provide correct answers to miscellaneous quiz questions about fundamental scientific constructs, of which the scale items represent a sample, and each construct is a replaceable indicator. A reflective measurement model of *scientific literacy* may include additional latent variables that account for the co-variation of items, such as an *acquiescence* response style and an *assumed ignorance* response style (Rughinis and Toader 2010).

The most usual computation of the individual score for the latent variable relies on counting the number of correct answers to the quiz (see, for example, TNS OPINION & SOCIAL 2005b, p. 41;

Vlasceanu, Duşa, and Rughiniş 2010; National Science Board 2008, p. 16). This method is easy to implement. However, it introduces errors in the estimate, since it grants each item an equal weight in the final count, while their strength of causal association with the latent dimension may in fact differ. At the same time, a count of correct answers ignores the inflation introduced by respondents' acquiescence, understood as a disposition to answer "True" to all quiz items independently of their specific content.

Item Response Theory (IRT) and Confirmatory Factor Analysis (CFA) provide means through which to estimate reflective models more accurately. Miller uses a multiple group IRT method to estimate respondent scores along a continuous latent trait, and, on this basis, he estimates country averages for scientific literacy in Europe and in the US (Miller 1998b, pp. 212-213, and Miller 2007c, pp. 4-8) and cohort averages for the US (Miller 2007a). Pardo, Midden, and Miller (2002, p. 11) use IRT as well in order to estimate the level of knowledge of scientific constructs in the area of biotechnology.

While confirmatory factor analysis has been used to test the dimensionality of the quiz scale(Miller 1998; Miller 2007b; Miller 2007a; Bann and Schwerin 2004), I did not encounter any CFA estimate of average scores on the latent dimension. A CFA based reflective measurement model for scientific literacy should also pass the tests of measurement invariance (Comşa 2010), if there is an intention to undertake cross-cultural comparisons.

A comparison of reflective and formative models of knowledge of scientific constructs.

The formative model does not seem relevant for the latent variable of general knowledge of scientific constructs, if it is understood as a causal, underlying trait that produces answers to interchangeable quiz items. Still, it may be relevant for knowledge of, or attitudes on scientific constructs in specific thematic areas, where each construct may hold its own relevance. For example, in Miller, Scott, and Okamoto 2006 (pp. 3-4) the Index of Genetic Knowledge is constructed as a summative score, by counting correct answers to a quiz, under what seems to be a reflective measurement model. On the contrary, the Attitude toward life index, which is also a summative score that counts the pro-life answers to three questions about human life, could be understood as following a formative model. It may be reasonably argued that the attitude toward life is not an underlying trait that produces individual answers to the three topics but, the other way around, it is the formative result of individual configurations of opinion on two key issues: the beginning of life, measured by the first item, and the moral status of the embryo, measured reflectively by the next two items.

While a summative score may approximate the score on a latent variable both under a reflective and a formative model, the meaning of the observed variable differs according to its theoretical specification. Reflective knowledge variables are interpreted as *abilities* or *competences*, while formative knowledge variables are better interpreted as *worldviews*, if their scope is large, or *representations*, if their scope is narrow. Whether a formative or a reflective model should be used depends on the researchers' choice.

Depending on theoretical considerations and, among others, on the degree to which high levels for one of them compensate for lower levels for the others, the latent variable may be conceptualized as continuous, ordered categorical or unordered categorical.

Moreover, starting from the observation that specialists' knowledge of scientific matters is qualitatively different from lay people's knowledge, which is more densely embedded in relational

and local contexts of significance, it may be argued that a given latent variable can better be operationalized under a formative model for the lay public, to match the fragmentary, composite nature of knowledge, and under a reflective model for the specialists, to match the coherent, systematic nature of their competences.

Table 5. A comparison of reflective and formative models for knowledge of scientific constructs

Issue	Reflective model	Formative model
Significance of the latent variable of knowledge of scientific constructs	Competence Ability	Worldview Representation
Significance of latent variables measuring knowledge of each construct	The true answer formulated by the respondent when confronted with the quiz item, in the interview situation	The true knowledge of the respective scientific constructs, prior to the interview situation
Relationship between latent knowledge of scientific constructs, and knowledge of each construct	The competence influences the respondents' answers	Knowledge of each construct shapes respondents' worldview
It can be estimated statistically by…	Item Response Theory Confirmatory Factor Analysis Latent Class Analysis	Structural Equation Models (it requires insertion into a predictive model for a dependent variable of interest)
Shortcomings of summative estimates	Measurement model is often not explicit Inflates knowledge estimates due to the "True" response style Incorporates random errors Items are given equal weights despite differential loadings of the indicators	Measurement model is often not explicit Inflates knowledge estimates due to the "True" response style Incorporates random errors Items are given equal weights despite differential regression coefficients of the latent variable on the indicators
Used for…	Understanding the general public knowledge of scientific constructs	Modeling people's worldviews or representations in relation to specific themes
Continuous or categorical latent variable	Usually modeled as continuous ability May be modeled as categorical for populations with highly uneven exposure to science	Depending on the theoretical model
Relevance of knowledge of evolution as an indicator for the latent operationalized variable	Knowledge of evolution in the general public is: - Differently related to the underlying ability for various religious groups - Weakly related to the underlying ability for some conservative religious groups	Knowledge of evolution may be relevant for several formative concepts, such as: - Acceptance of a scientific worldview regarding religiously contested concepts - Human exceptionalism

The same difference between different types of knowledge of scientific constructs highlights another hidden assumption of the reflective models discussed above, namely, that the latent variable is a continuous ability or competence. It may be that a categorical conceptualization would better fit the discontinuous nature of the relationship between lay people without a background in science, and trained specialists in scientific fields. It is also possible that the measurement model differs according to other characteristics of the social context. Working under the assumption that increased contact with science, and prolonged scientific education introduce a qualitative change in knowledge of scientific constructs, we can advance the hypothesis that a continuous ability is a proper measurement model for countries or social contexts with relatively high exposure of the population to scientific constructs, while a categorical model is better for contexts where people are inconsistently exposed to science.

Table 5 above presents a comparison of the two measurement models for the vocabulary dimension of civic scientific literacy.

4.3.2.2 Distinguishing constructs: quiet versus animated

Evolution is an example of an animated, existentially relevant scientific construct, and the next sections focus on understanding its relevance for the NSF scale and the concept of scientific literacy, in particular, and for public engagements with science in general. Apart from it, there are other such constructs in the scale. For example, "Cigarette smoking causes lung cancer" is an example of an item that makes reference to matters of importance for many respondents – in this case, the good and bad of their own and others' smoking. The item on smoking has been eliminated from the short NSF scale because it had a low loading on the underlying dimension (Bann and Schwerin 2004) and low discrimination value in the IRT model, while also being one of the easiest items (idem). Besides its unruly statistical behavior in the scale, there are other particularities of this item that are not manifest in psychometric evaluations, such as the specific ways in which respondents actually believe it to be true in general, but not true for them[7].

The reproduction item, "It is the father's gene which decides whether the baby is a boy or a girl," invokes a "gene" construct involved in emotionally charged conversations and decisions about babies and reproductive strategies, having caused measurement predicaments too. Consequently, the Oxford scale removed it (Durant, Evans, and Thomas 1992). However, the NSF quiz still preserves it, despite its low loading and discrimination power, but in order to maintain comparability of summative scores with the longer earlier version of the quiz, given that it was the only item on which women had systematically higher probabilities of correct answers than men (Bann and Schwerin 2004). This is another instance in which the everyday life relevance of a scientific construct shapes its acquisition and appropriation processes, rendering it incommensurable with the more remote scientific constructs.

The evolution item is particularly pertinent for evaluating the assumption that understanding scientific constructs in lay knowledge is the same as believing in them. As the National Science Board's report "Science and Engineering Indicators 2008" indicates, a considerable proportion of US respondents are familiar with the scientific vocabulary of evolution, while declining to acknowledge the fact of evolution. In the 2004 Michigan Survey of Consumer Attitudes, 74% of US respondents agreed that "*According to the theory of evolution, human beings, as we know them today, developed from earlier species of animals*". In turn, only 42% agreed with the item formulated as a description of the natural world, without the prefatory emphasis: "*Human beings, as we know them today, developed from earlier species of animals*" (National Science Board 2008, pp. 19-20).

Confronted with the deletion of the evolution item from the 2010 NSF report, Miller answered that "[p]art of being literate is to both understand and accept scientific constructs" (apud. Bhattacharjee 2010). Then, the issue is whether a person who has a lay understanding of the scientific concept of "evolution", but does not accept it as descriptive for the world, is less scientifically literate than a person who has the same lay understanding of the concept, but accepts it as descriptive of the world. This matter raises definitional questions about the meaning of scientific literacy. If we define scientific literacy as a general disposition to understand and believe in quiet scientific constructs,

[7] Desantis (2003) offers an insightful account of how locally produced "collective rationalization" shapes beliefs about scientific facts about cigar smoking.

than evolution seems not to be relevant for this measure, at least in the United States. If we define scientific literacy as the belief in fundamental scientific constructs, including the quiet but also some animated constructs, there seems to be no unique disposition to believe in them all. Beliefs in animated constructs do not share the same process of causation with beliefs in quiet constructs. Moreover, beliefs in animated constructs are not replaceable indicators, because each of them illuminates particular, situational accomplishments for various publics in their work to understand and live with science. Therefore, such an understanding of scientific literacy calls forth a definition in terms of specific configurations of beliefs about scientific constructs, or possibly as worldviews, instead of general individual dispositions.

The methodological implication of the distinction between animated and quiet scientific constructs is that animated constructs may not be theoretically relevant for measuring the ability of the respondent to understand (and believe in) quiet constructs, under a reflective measurement model, which focuses on the underlying common cause of observed indicators. In addition, these constructs may be even more interesting and telling about the public understanding of science than the detached, classroom scientific facts. Their measurements are meaningful not as interchangeable indicators of respondents' underlying abilities, but in themselves, as information about how science is experienced in everyday life situations. Therefore, animated constructs are best measured either on their own or as components of scientific worldviews.

To shed light on the incongruity of animated constructs in reflective models of scientific literacy, the section below explicates the differences between concepts operationalized by reflective versus formative measurement models and presents the use of the reflective model for measuring scientific literacy.

Evolution as an Animated Scientific Construct

Evolution is a key concept and established fact within the biological sciences, accounting for a diverse body of empirical evidence including observed transformations within living species, similarity of structures in living and fossil species, or transitional structures observed in fossils (Gould 1983). As Gould observes, "[e]volutionists have been clear about this distinction between fact and theory from the very beginning, if only because we have always acknowledged how far we are from completely understanding the mechanisms (theory) by which evolution (fact) occurred" (Gould 1983, p.2). Nevertheless, the fact of evolution has had a mixed reception among different public groups, and it has constantly re-emerged at the forefront of public debates involving the nature of humankind and the relationship between religion and science.

Besides being a fundamental, textbook scientific construct, evolution has an existential relevance for many people and is one of the very animated constructs, especially in the United States. A detailed discussion of the understanding and use of evolution within common sense thinking or public controversies lies beyond the scope of this paper. In what follows, I discuss evolution as an animated scientific construct and briefly highlight how it differs from the quieter constructs in the NSF quiz. The scope of this distinction is to explore acceptance of evolution as a case in point for learning about public engagement with science, as well as about the scientific literacy construct.

Unlike the working of the lasers, the movement of the continents, or the temperature of the centre of the Earth, evolution is a highly debated concept, embedded in social interactions and relationships. As compared to heavenly bodies or electrons, the construct of evolution is used in

other types of communication and in different relational settings. On the one hand, evolution is often evoked in interactions that have some religious or political underpinnings; on the other hand, evolution is called upon in contested communications that require participants to take a stance and negotiate an affiliation. Of course, the significance of evolution in such public encounters does not derive from its capacity to account for empirical data from biological experiments or from fossil records, all of them being of largely no significance for the daily lives of most of us. In contrast, evolution engages the public because of what it means for issues such as the exceptionality of the human species, the meaning of life, or the validity of religious knowledge claims about the world in confrontation with science. Is it true that human beings are essentially of the same kind as other animals – or is there something truly special about the human consciousness, spirit, or soul? Is it true that human beings have appeared by utter chance, or was our entrance in the world purposefully created? Does religion have anything to say about the constitution of the empirical world, or should it delegate all empirical claims to science? It is in such a landscape that standpoints in favor or against evolution are framed (Grimm 2009), shaped and settled[8].

If circulated as a symbol for community allegiances, the salience of evolution as a true or false representation of the world increases in social confrontations. This has been historically the case in the US, where the rejection of evolution is a currency of the far-right politically conservative groups (Mazur 2005; Miller, Scott, and Okamoto 2006b), and to a growing extent in Turkey (Edis 1994; Cavuslu 2009; Hameed 2008), but less in other European countries.

The religious and political import of evolution comes in conjunction with its seemingly counter-intuitive character. Evolution and natural selection appear to be at variance with some deeply ingrained common-sense thinking heuristics, arguably more than other scientific constructs. Macro-evolution and the concept of emergent properties call into question essentialism underpinning the lay conceptualization of the species and their traits, while the idea of random variation in natural selection and the reliance on statistical thinking counters finalist and mechanistic reasoning (M. E. Evans 2008; Poling and Evans 2004; Thagard and Findlay 2009).

The substantial body of research on the acceptance of evolution in the United States, particularly in education sciences, sheds light on the interwoven conflicts, controversies, doubts and certainties that mediate the ways in which evolution is understood, judged, and sometimes accepted (Eve Raymond and Dunn 1990; Scott 1997; Meadows, Doster, and Jackson 2000; Grimm 2009; Superfine 2009; Nadelson and Southerland 2010). For many people from the United States, encounters with evolution are radically different from their encounters with lasers or electrons. This is a theoretically relevant consideration to be taken into account when deciding whether evolution is a good indicator in a reflective operationalization of scientific literacy.

[8] The position of the Roman Catholic Church, as presented in the Message to the Pontifical Academy of Sciences of John Paul II (1997), is an illuminating example for how solutions to the evolution debate are proposed in order to accommodate both scientific evidence and theses about the meaning of life. While accepting that "the theory of evolution is more than a hypothesis" (p. 382), and granting its explanatory status in relation to observed biological data, John Paul II has maintained human exceptionality and the purposefulness of human existence by clarifying that "[w]ith man, then, we find ourselves in the presence of an ontological difference, an ontological leap, one could say. The sciences of observation describe and measure the multiple manifestations of life with increasing precision and correlate them with the time line. The moment of transition to the spiritual cannot be the object of this kind of observation, which nevertheless can discover at the experimental level a series of very valuable signs indicating what is specific to the human being" (p. 383).

5 Overview of research contributions

In the previous pages I have presented my main research contributions and I have discussed their significance in the context of the literature on surveys as a form of sociological knowledge.

My recent research has contributed to the methodological literature in fields of ethnic studies and public knowledge of science. I have argued that survey-based research is to a significant extent independent from sociological theorizing in other social research traditions, at least in these domains, and that measurement practices and the statistical apparatus shape a distinctive theorizing style.

Some of the practices of survey-based sociological research that are highly theoretically loaded, and which I have illustrated in my research, include:

- The decontextualization of respondents' answers, by erasing interviewers' participation at multiple moments of the research; therefore, answers are made to *describe respondents*, instead of being interactional events.
- What *actually happens* in the survey is taken to be an approximation of a *truer reality* that is affected by error; the analytical focus in not on what happened, but on detecting invisible phenomena that lie behind empirical occurrences; this orientation towards evidence is supported by an ensemble of procedures that I have termed the 'error-trait' device, including techniques of identifying and removing error, imputing missing values, and estimating latent constructs;
    - To this purpose, aggregation is considered as a tool for gaining precision;
    - Also, inter-individual variability is used to understand intra-individual variability, as cross-sectional correlations are used as input data for estimating the central tendencies and variability of individual traits (Borsboom, Mellenbergh, and van Heerden 2003).
- Analysis methods such as regression, path and structural equation models represent individual behavior as influenced by relatively stable individual traits, located within the individual mind, which may be best understood in isolation from other traits and abstracted from the situation of interaction; this understanding of social action is similar to the psychometric perspective in psychology, created as a theoretical by-product of the quantitative methodology (following the account of Danziger, 1990).
- The terminology of statistical analysis encourage a quasi-causal vocabulary of effects and influences, which is additionally supported by the imputation of survey answers as 'individual traits'.
- The questionnaire imposes its structure of relevance for the interview conversation, which is then transferred in account of respondents' lives and actions. If researchers are interested in ethnicity, for example, people will be represented as bearers of ethnic labels and marks in all aspects of their lives that are covered by the survey – such as education, employment, family strategies, migration and so on. The issue is no longer whether and in what context ethnicity is relevant for actions in these fields, but only 'to what extent' – or, in an even more specific terminology, what is the 'effect size'. Or, if researchers are interested in scientific literacy,

which researchers have defined to include familiarity with lasers, then people's responses to questions about lasers are taken as indicative of a certain trait that they possess and that also explains (more or less) their behavior when encountering some instantiation of scientific constructs. Whether and in what circumstances respondents have had anything to do with lasers or the 'laser' construct is deemed irrelevant.

- The issue of measurement error largely displaces considerations on whether quantification is possible and relevant for a specific social process, and what are the particular, contextual and changing problems of quantification in a certain area of interest. The treatment of error is regionalized into issues of a) scale coherence and data reduction, b) model goodness of fit, and c) sampling error, to the expense of a substantive evaluation of the meaning of quantities produced in research and their various forms and sources of imprecision (Haslam and McGarty 2001). Discussions of errors are formulated within a framework of practicality, which translates issues of quantification in/adequacy, either theoretical or moral, as matters of quantifiable 'approximation', by searching (and often finding) a level of imprecision that is declared largely adequate for the task-at-hand.
- Researchers rely on typologies that resonate with common reason concerns and classifications, with scarce attention to the connections between first-order and second-order constructs (Schütz 1953); in this process, moral arguments and classifications enter the research universe and its thread of argumentations without the required reflexivity and attention to theoretical implications. For example, the debate of hetero- versus self-identification of ethnic affiliation has been largely driven by ethical and political concerns external to the field of theoretical discussions of ethnicity; in the same vein, the concept of 'scientific literacy' has introduced school-specific concerns in research concerning knowledge of scientific constructs for a large variety of publics, thus marginalizing theories concerning the specificity of common sense knowledge.

These practices in survey-based sociological research support a theoretical view of social action that largely ignores concrete, empirical social interactions. While individuals are conceived as participants in interaction and as shaped in interaction, by processes of socialization, survey-based sociological research attempts to study individual behavior as a result of traits that reside within the individual. These traits are represented as shared, variable in intensity and sometimes in quality, and potentially combined into types; nonetheless, a main focus of attention remains the individual trait, operationalized as a variable.

Of course, researchers use survey-based evidence to work with a plurality of theoretical perspectives. Survey-based research practices may favor a particular type of theoretical outlook, but they do not determine it. In practice, survey evidence is put to use in a large variety of theoretically informed inquiries. Surveys may accommodate research into social structures and research into individual actions, affording empirical investigations of key theoretical questions in sociology such as the reproduction of inequalities or the creation and re-creation of institutions. Still, one weak spot remains their low sensitivity to social interaction as it unfolds methodically, in the situated here-and-now. In this thesis and in my further projects I am interested to explore the potential of survey-based sociological research as a resource for investigations that take into account the interaction order and its links with the institutional order (Warfield Rawls 2011; Warfield Rawls 1987).

In this thesis I have discussed the significance of my theoretical and methodological analyses as contributions to a re-orientation of survey-based research towards an interactionally-sensitive theoretical outlook. Such a change in theoretical grounding may be accomplished at different levels of complexity. In the first instance, we can achieve a compatibility of survey-based analysis with theoretical inquiries that are based on an interactional view of social action and language use. In a second instance, surveys may be designed in a novel research agenda. Several analytical orientations that may encourage a theoretical awareness of the interaction order include: a) analyzing and interpreting data as collaborative outcomes of situated interaction, b) re-specifying the concept of 'error' in line with participants' understanding of what counts for a mistake – such as typing errors, or misunderstandings – instead of decomposing the variability of meaningful answers into "true value variability" and "error variability"; c) higher reflexivity on analysts' use of categories by empirically studying their variable contextual relevance in social interaction, d) increased theoretical attention to typification and second-order typology construction, e) less focus on statistical significance in favor of a preoccupation with substantive troubles of quantification and issues of absolute and relative size, and f) attention to the reliance on common reason categories and concerns, to our commentaries on them, as analysts, and to how our findings are likely to be taken over in common reason social knowledge claims.

In the following paragraphs I discuss several of the main changes in research practice that can support such an adaptation of the survey instrument to an interaction order theory.

The causal jargon

Probably the easiest point to start such an effort is the use of the survey-report rhetoric, focusing on the quasi-causal statistical vocabulary. Presentations of research results are loaded with concepts that have causal implications, with the occasional disclaimer, in 'Discussion' sections, to the effect that such terms may not really refer to causal relationships. If we do not want to argue that avowed ethnicity "explains" behavior, or that it has a "direct effect" on expressed beliefs, it is probably best not to say so, not even figuratively.

Confirmatory versus exploratory inquiries

Compatibility also requires a change in mission. A frequent classification of quantitative and qualitative research methods marks the first as confirmatory, providing definite answers for sociological hypotheses, and the second as exploratory, opening questions for further quantitative investigation. From an interactional theoretical perspective, the relationship is virtually reversed. To the extent that any analysis can be considered confirmatory, or providing stable answers to sociological questions, such an analysis would be looking closely at a corpus of evidence concerning situated, concrete, rich interactions. The distant, de- and re-contextualized, aggregated interaction outcomes that are presented in traditional survey-based research can only have a status of exploratory inquiry, proposing typologies for further validation and drawing attention to phenomena that, by their apparent intensity when so quantified, indicate that some strongly methodical activities are at work in producing them.

Measurement errors, missing data, and other anomalies

A second major change required for such a theoretical compatibility refers to the analytical status of measurement errors, biases, uncertainty, and missing data. Mainstream quantitative research is oriented towards reducing uncertainty as much as possible (Haslam and McGarty 2001) and

correcting really-occurring events so that they would reveal a hidden reality. Statistical procedures of aggregation, correlation, and imputation are put in place to repair reality to the shape of a *truer* reality. The loyalty of a researcher working under an interactional theory lies strictly with actual occurrences, at the expense of the so-called 'latent' phenomena. Inconsistencies, misunderstandings, refusal of cooperation, irony, humor, deceit are part and parcel of social interaction and, to the extent that they are present as evidence, they are to be treated as evidence, instead of being erased from view.

In particular, if ethnicity is the topic of study, refusals to answer questions on ethnicity, or unexpected answers are the very subject matter for the investigators. Situations in which ethnicity is immediately recognizable are equally interesting, and even more so are situations in which ethnicity, as an interactional concern, comes out as strange, misunderstood, or even absent (a situation rather unlikely if questionnaires are explicitly oriented towards ethnicity). If public knowledge of science is the topic of study, "Don't know" answers are qualitatively different from volunteered answers that later prove to be wrong. One's lack of engagement with a question is as informative as one's engagement, and misunderstanding is as informative as understanding.

A sample of interactions

Survey-based research has the potential to become part of an agenda of large scale qualitative research, generating information about social encounters that covers a variety of social settings otherwise unavailable to researchers. The issue of representative design becomes central: such encounters should be meaningful for participants in relation with their out-of-the-interview lives, in order to allow for some sort of intelligible connection. This richness of information is valuable if survey answers are interpreted as events, and not as descriptions of people. Surveys may be designed to sample conversations, encounters, searches – and to report on efforts to communicate with people across a large geographical and social space.

6 Plans for future development

My current research plans are focused on developing a survey-based sociological approach that accommodates an interactional perspective, specifically for the study of subjective wellbeing – as captured in common-reason and scientific terms such as happiness, satisfaction, quality time, flow, meaningful life, or intrinsic motivation for an activity.

I have formulated two research projects that support this inquiry. The first project is concerned with current research practices, in applied sociological investigations in the field of market research. The second project aims to develop a methodology for quantifying subjective well-being as part of a sociological inquiry into its interactional and institutional support, in present day Romania.

Table 6. Overview of my two current research projects

Project features	**Igel**	**LiSa**
Implementation details	Financed under the PN-II-RU-TE-2011-2 program 2011 - 2014	Application under the ANCS Partnerships Program, 2011 Currently under evaluation
Objectives	Study of current research practices in applied sociological investigations in the field of market research - Focus: use of quantification	Development of a quantification methodology that allows for theoretically meaningful indicators of subjective well-being
Main concepts	Consumer motives, needs Consumer satisfaction Sociological imagination	Subjective well-being Happiness
Research questions concerning quantification	How do practitioners make use of quantification techniques in market research? - What are the specific uses of quantification, in relation to their customers and their professional objectives? - How do they embed quantification procedures in the overall research process? - What implicit and explicit theories of consumer choice and consumer behavior are supported by practices of quantification?	How do different practices of quantification answer to practical concerns of various researchers and audiences? How is quantitative evidence of happiness embedded into larger research programs? What is the theoretical relevance of quantification processes? What theories of happiness are explicitly and implicitly supported?
Dialogue with other social research threads	Addressing the academic – practitioner divide in market research Discussing the issue of disciplinarity in market research – the specificity of a sociological perspective on researching *motives*	Engaging alternative traditions of quantification of happiness: a) Survey-based research on happiness b) Experimental research on happiness
Trans-disciplinary dialogues	Research findings are also oriented towards: a) sociologists and social psychologists that work as practitioners in market research b) sociology students interested in market research	Research findings are also oriented towards: a) respondents and other research participants b) public authorities and other organizations interested in monitoring quality of life c) the general public and mass-media d) students interested in studying subjective wellbeing
Expected results	Scientific publications Study guide for students	Scientific publications Research reports addressing specific public and professional concerns

6.1 Igel - Sociological imagination and disciplinary orientation in applied social research. An inquiry into present-day market research in Romania

6.1.1 Scientific context: studies of science in applied and corporate settings.

There is a rich body of social research investigating the production of scientific knowledge. The most heated debates have centered on the contingent social construction of nature sciences in local interaction situations (Collins 1983; Fine 1996; K. D. Knorr-Cetina 1982; Latour and Woolgar 1986; Karin D. Knorr-Cetina 1981; Shapin 1995; Krohn and van den Daele 1998). The detailed descriptions of science-in-the-making advanced by empirical investigations in research sites, especially in laboratory studies, has inspired a sociology of social scientific knowledge that is simultaneously attentive to symmetries of natural, social and other kinds of knowledge, on the one hand, and to assymetries between strands of sociological inquiry (Leahey 2008; Maynard and Schaeffer 2000), on the other hand. Sociological research on science, including sociologies of sociology, are drawn to reflexively discuss the epistemic specificity and legitimacy of sociology itself. Our project takes over the understanding of the heterogeneous, situational and interactional production of scientific knowledge and employs it as a foundation for the investigation of corporate market research in Romania. We thus relate to the research manifesto formulated by Penders, Verbakel, and Nelis (2009) with regards to the social study of corporate science.

This project's field of scrutiny, market research in Romania, is a Cinderella of science, displaying manifold signs of weakness: an applied knowledge pursuit of for-profit organizations serving other commercial clients, with a mosaic of instruments and theoretical models crossing academic disciplines, organized in an East-European country. At the same time, the very features that indict market research as problematic from a normative positivist perspective also render it an important subject matter for social inquiries: it produces actionable knowledge about social actions, and it is consequential for corporate business decisions, thus partaking in the creation of our material and organizational environments.

A preliminary inquiry into the professional orientation of present-day Romanian market research institutes, based on a review of their web-sites and several brief discussions with researchers and managers, indicates three relevant organizational features: client diversity (marketing departments that serve a single organization vs. research companies with multiple clients), size, and affiliation to international corporations. Large companies offer a variety of services employing both qualitative and quantitative methods, while some of the smaller ones are specialised in a specific type of methodology. Market research institutes may be part of larger international corporations. In this case, they are significantly oriented towards a shared corporate research approach.

Present day market researchers in Romania have various educational backgrounds. Most of them have graduated marketing, sociology, psychology, and other social sciences. The disciplinary background of the research team is often presented on the company web site, which represents an indicator of its significance, at minimum for public relations.

Therefore, we find ourselves part of a consistent tradition of *scholarly reflection on applied social research* and, specifically, in the plentiful thread of work that relates *academic and practitioner knowledge* in market research.

In the intense debate on actual and possible relationships between corporate market research and academic scholarship, authors discuss possibilities and impossibilities of mutual relevance, while

charting and explaining differences and similarities (Baines et al. 2009; Brannick and Coghlan 2006; Brennan 2004; Brinberg and Hirschman 1986; Calof and Wright 2008; Catterall 1998; Cornelissen 2002; Razzaque 1998; Shugan 2004). Comparisons direct attention to differences in the research situations between applied and academic social research, invoking, among others, heterogeneous research questions, strategies, and success criteria, audiences, available resources and constraints, literary genres in reporting results, and ethical risks.

6.1.2 Research focus

We are particularly interested in the theoretical orientations of applied social research and market research in particular. Previous research on theories in marketing has mainly discussed theory as a prerequisite of research design, looking for example at differences between practitioners and academics in theorizing styles (Cornelissen 2002), in affinity towards a positivist/empirist or a relativist/constructivist epistemology (Razzaque 1998), in understanding the value of qualitative research (Catterall 1998), or in research paths that connect concepts, methods and empirical evidence (Brannick and Coghlan 2006; Brinberg and Hirschman 1986). The substantive theories that orient marketing research have been discussed mostly in the context of its disciplinary classification; for example, MacInnis and Folkes (2010) argue that consumer behavior research is a multidisciplinary subfield of marketing, identifying as its main theoretical strands the behavioral decision theory, information processing psychology and consumer culture theory (p. 910). Hoffman and Holbrook (2007) discuss the disciplinary focus of academic consumer research, distinguishing the "more macro level of sociology or anthropology" from the "more micro level of cognitive psychology" (p. 514). Notably, the so-called micro- or interactionist perspectives of sociology and anthropology are not mentioned in both analyses. Humanistic, hermeneutic or social constructivist approaches are often proposed for marketing research (see for example Arnold & Fischer, 1994; Goulding, 2005; Hirschman, 1986) – but it is not clear how and if they are used in practice, mainly because there is little research on practitioners' substantive theoretical orientations. Our project aims to fill this gap.

We propose a *novel concept* as analytical tool when researching the sociological orientation of market research: the *interactional imagination*. As a starting point in our approach, we define the interactional imagination as a researcher's disposition to attend to the situational and interactional accomplishment of social action. Following the sociological debates on the specificity and autonomy of an interaction order (Goffman 1983; Warfield Rawls 1987), we propose the concept of interactional imagination as a sub-type of sociological imagination which may be consequential for understanding the production of scientific knowledge in research sites (K. D. Knorr-Cetina 1982) and for the daily professional decisions of social researchers, both in qualitative or quantitative investigations, academic or applied.

Sociological imagination, and interactional imagination in particular, may aptly be studied in relation to two core scientific constructs in marketing research: *motivation*, in the theoretical register, and *focus group investigations*, in the methodological register. The two constructs have a prominent position in market research, they have been distinctively developed in sociology, as well as in other disciplines, and they confront the practitioner with a wide repertoire of possible interpretations and decisions in research design.

Research on motives has figured prominently in market research since its very beginnings, both in psychologically unsophisticated surveys (G. Wagner 1938) and in innovative theoretical

developments. The motivational research school of Ernest Dichter has been "the most significant area of consumer research in the 1950s" (Stern 2004), and research on motives has continued to develop after its decline, in various theoretical frameworks. In the meanwhile, between Wagner's (1938) critical discussion of reliance of motives in market research and Dichter's development of motivational research, Mills (1940) published his influential work on "Situated Actions and Vocabularies of Motive", which has shaped research on motives across the discipline. His focus on motives as shared vocabularies, methodically used to render action intelligible to oneself and to others, has later been taken further in arguments that motives are of interest in sociology only as a methodical activity of motive ascription (Blum and McHugh 1971), and it has been critiqued for initiating an unjustifiable displacement of motives from sociological analyses (Campbell 1996). Despite their clear potential to serve as an argument against a search for internal, private states that act as resorts for action (see for example Hopper, 2001), vocabularies of motive are also employed in research that relies on a conception of action driven by causally antecedent motives (Corey and Wilson 1994; Monaghan 2002). Sociological reflection on motives is relevant for understanding consumer choices (see also the discussion of Campbell, 1998 on the rhetoric of need and want) and for understanding conversations about motives, including interview questions (Bolden and Robinson 2011) – with undeniable methodological significance. Therefore, an empirical inquiry into the theoretical and methodological treatment of motives in current market research is a particularly germane approach in searching for disciplinary orientations and sociological imagination.

If motives have constituted a theoretical benchmark for market research, *focus groups* have been at the core of its methodological repertoire, in particular in the qualitative approaches. There is a wealth of theoretically-laden methodological discussion of this research method, which comes in a variety of designs, purposes, and interpretations (Boddy 2005; Morgan 1996). Focus groups may be used as a "quick and cheap" way of gathering opinions or attitudes (Catterall, 1998, p. 72) or as a delicately balanced method for understanding interactional dynamics and situationally generated orders (Kitzinger 1994). Consequently, the method is often discussed, also in consumer research, with reference to misuse and misinterpretation (Threlfall 1999). As a research tool with sociological tradition and rich interactional relevance, focus groups offer an opportunity for understanding the sociological and interactional imagination at work in market research.

6.1.3 Methodology

Our project consists of a sociological research on disciplinary orientations and sociological imagination in market research, in the cities of Bucharest and Cluj-Napoca. We will rely mostly on practitioners' accounts of their research work, in individual and group discussions. Whenever possible, given constraints of confidentiality in corporate market research, we shall also engage in observation of research sites and activities, and documentary analysis of research reports and handbooks.

Our methodology relies primarily on *single occasion and repeated interviews with practitioners*, joined by *research workshops* bringing together practitioners and academics, *documentary analysis* of research texts and textbooks, and *observation* in market research organizations – thus following a rich thread of sociological investigation of science via scientists' accounts (Gilbert and Mulkay 1980; Lee and Roth 2004; Mulkay and Gilbert 1982; Mitroff 1974), and methodological inquiries into the kinds of knowledge accesible by such methods (such as in Karin D. Knorr-Cetina, 1981; Mulkay & G. Nigel Gilbert, 1983; S. W. Woolgar, 1976; Yearley, 1988).

6.1.4 Impact, relevance, applications

The main scientific impact of this project consists in developing a sociological understanding of theory use and theoretical orientation in market research – as regards disciplinary distinctions and sociological imagination. The project will ellaborate the concept of interactional imagination, and it will assess its theoretical value. Our research will also support the ellaboration of a methodological reflection and report on analyzing interviews with practitioners, including repeated interviews, in order to understand applied social research.

Based on our inquiry, we will propose a curriculum module for sociology departments aimed at market researchers and other applied research practitioners. This contribution to curriculum development will support students' understanding and meaningful use of sociological imagination in applied social research.

6.2 LiSa - Gaps and bridges. Pursuing individual life satisfaction and happiness in the public sphere

6.2.1 Scientific context

There has been a gradual recognition, both in scientific and policy arenas, that economic indicators do not capture everything about personal, organizational and societal well-being (Yan, 2008; Easterlin, 2001; Boyce, Brown and Moore, 2010). There is a powerful tendency to capture social indicators of subjective well-being, alongside indicators that aim to measure the objective circumstances of life, including the economic environment.

The urge for such an analysis is originating primarily in the famous two-years-old report of J. Stiglitz, A. Sen and J.-C. Fitoussi on the measurement of economic performance and social progress (Stiglitz, Sen and Fitoussi, 2009). The issues raised by this report have been also taken over by OECD in its *Better Life Initiative* (OECD, 2011). Both projects underline that the standard macroeconomic indicators fail to give an adequate account of individuals' well-being and social progress, and that policy making should focus not only on standard macroeconomic statistics, like those related to GDP, for evaluating the current state of a society, but also on citizens' well-being in order to ensure access to opportunities and personal development. This tendency in social indicators is convergent with the well consolidated focus at organizational levels for evaluating employee domain-specific and overall happiness and life satisfaction. Moreover, a rich body of current survey research problematizes the paradoxical relationships between economic status and subjective well-being at individual and societal levels (see, for example, syntheses of previous research in Easterlin 2003, Veenhoven 2004, or Kahneman and Deaton 2010).

What are the implications of these research threads and policy orientations for an enhanced public and scientific understanding of the ongoing transformations in the Romanian society? Unfortunately there are no references to Romania in these reports, and, as researchers in social sciences, we are confronted with a national shortage of data and information when attempting to undertake a comparative analysis of the sort.

6.2.2 Research focus

The LiSa project engages the current global debate on the relevance of happiness and life satisfaction in public arenas, aiming to contribute empirically and conceptually to its development. We align our project with currents of research and theoretical reflection that argue that happiness

and life satisfaction are worthwhile topics of personal and professional reflection, effort and also of public policy (Veenhoven, 2004) – while acknowledging the considerable challenges in understanding and fostering subjective well-being (Kahneman 2003, 2006), both due to patterned styles of individual judgment and action, and to the considerable diversity of worldviews and lifestyles – challenges amplified by the limited predictability of public policy results.

Our research approach is **innovative** in four main respects:

- *Empirical coverage*: From an empirical point of view, Romania has been an almost uncharted territory in this respect, due to lack of comparable information – as witnessed from the absence of data on Romania in *inter alia* the recent OECD report. We plan to open this debate nationally and internationally by collecting comparable national level data on subjective well-being (including the measures employed in the OECD report, such as the Cantril ladder and the measurement of positive affect balance, as well as other relevant instruments).
- *Focus on culturally informed agency*: Conceptually, the current debate is focused on measuring subjective well-being as a state of fact, interpreted as a personal reflection of previous and current life experiences that, along with societal standards, shape individuals' requirements and expectations and, consequently, their subjective well-being (Pop, 2008). We propose to investigate happiness not only as an existent reality, but as an on-going accomplishment, by looking at how people actively pursue it – following the research tradition on emotion work opened by Russell Hochschild (1979). Therefore, we focus on how people conceive of their present and future well-being and how they search for it: in what social spaces is happiness to be found? What are the lay theories of happiness, and how do they orient social action – in the present-day Romanian society? How do these lay theories relate to the empirical configurations observed in social research (Rughiniş, 2007)? What types and configurations of engagement with the available social worlds are sought for, and how is the private / public divide constructed in this pursuit? Specifically, how is happiness understood and pursued in particular professional worlds, such as education?
- *A configurational approach*: We also acknowledge that subjective well-being is to be understood not only unidimensionally, as a difference between positive and negative affects or evaluations, but as a phenomenological configuration of happiness and unhappiness, satisfaction and dis-satisfaction – since both tonalities are meaningful experiences that often co-exist in complex world-views and self-definitions, creating tensions that energize action. Our project charts the positive and negative experiences distinctly, and it inquires into how persons orient their actions in relation to them.
- *Focus on public phenomena*: Moreover, we conceptualize happiness and life satisfaction as essentially public, interactional phenomena – even if they are pursued in the private spheres of life. We investigate subjective well-being as it is expressed in public interactions, and as it is shaped by shared cultural theories, lay and specialized, individual and organizational, about living a good life. We inquire into the social practices (e.g.: embedded constructs, beliefs, learning experiences) of pursuing happiness and life satisfaction, their distributions across social spaces, with a focus on professional worlds of business and education, and their reliance on shared discourses and vocabularies of motive - in the research tradition of Mills (1940) - of how and where a good life is to be found.

The project thus relies on a twin inquiry:

- On individuals' active pursuit of happiness and life satisfaction, across a multiplicity of private and public spaces – and in relation to their position in a multidimensional social and economic structure;
- On cultures and lay theories of subjective well-being, following them at individual, interactional, organizational and social levels.

6.2.3 Methodology

Our theoretical and methodological premise is that individuals cannot be understood as isles, but as participants in social worlds. As such, our lives display both social influences, observable as stable patterns and relationships, and agency, our own constant work of defining and answering life's situations. We rely on a large scale survey to observe social regularities and thus to gain insight into the power of social structures to shape subjective well-being, and we conduct a thorough and in-depth qualitative investigation to explore happiness-in-the-making, with a focus on the discursive work in which individuals define, explain, justify, project and plan for their happiness, or for others' subjective wellbeing (Rughiniş, 2007).

The project therefore employs qualitative and quantitative methods designed to support one another in identifying and focusing on the relevant empirical evidence. The main stages of the empirical research include: 1) an exploratory qualitative investigation, 2) instrument development and testing, 3) a quantitative survey of the general population (2000 respondents), 4) in-depth qualitative research, including individual interviews (120 respondents) and focus groups (4 interviews), and 5) a final wave of in-depth interviews pursuing the salient findings from quantitative analysis.

6.2.4 Impact, relevance, applications

The project expected results include:

- A better understanding of the culturally informed pursuit of subjective well-being in the general public and in specialized professional communities of practice (communicated in scientific publications);
- A comprehensive model of the configurations of capital-related and subjective indicators, and inequalities in their distributions in present-day Romania (communicated in scientific publications);
- Instruments for a sustained reflexivity on subjective well-being in academic and policy arenas, including:
    - Scientific instruments, such as measurement scales and inventories, and datasets available for further secondary analysis;
    - Organizational instruments, such as structured themes for reflection on subjective well-being in various types of events and evaluations;
    - Policy-relevant instruments, including a report that discusses the measured indicators and their utility for policy design;
    - Online instruments for the engagement of the general public, developed on the project site.

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