National Centre for Research Methods Report

# Review of the Typology of Research Methods within the Social Sciences

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## Introduction

The National Centre for Research Methods (NCRM) typology was originally developed by Beissel-Durrant (2004). That typology provides a hierarchical classification of research methods used in the Social Sciences and has been used by the NCRM to categorise training events, research activities and other outputs and has become one of the most frequently downloaded items from the NCRM website. The typology underpins the reporting of training and research needs within Social Science research methods to the Economic and Social Research Council (ESRC). As a key resource it is was thought important to review how the typology was working, whether it required any revisions in light of developments over the last 10 years, how it was being applied, how effective this was and whether there were any new approaches that should be considered to enhance or indeed replace the Research Methods Typology.

## What are the key requirements of the NCRM Typology of Research Methods?

The Research Methods Typology, both now and in the future, will be used to label all items produced by, hosted or linked by the NCRM in various databases on their website. This supports not only the NCRM itself, but hosts content relating to a continually evolving programme of research methods investments by ESRC, the UK's largest social science research funder. The NCRM databases currently include an EPrints document repository (http://www.eprints.org/uk/) and a bespoke database of research methods training and events. The typology is thus an important element of the Social Sciences research infrastructure, providing a classification mechanism for a wide range of activities and publications which may be searched and retrieved online. As such the typology is required to:

- Assist discoverability and retrieval of relevant events and resources for a broad range of users, including:
  - Those from both academic and professional research backgrounds
  - Those from all career stages, from students through to professors
  - Those searching for a specific method and those wishing to search more general areas
  - Those from a range of social science and affiliated disciplines
- Categorise items in the training and events database. This includes items from the NCRM, and ESRC Doctoral Training Centres (DTCs) and a growing collection of online training materials.
- Categorise items uploaded into NCRM's EPrints publications repository whether produced by NCRM, those affiliated with NCRM or from associated events. These include
  - Journal articles
  - Working papers
  - Presentations
- Categorise digital media resources such as podcasts and videos

- Categorise web content. This could be NCRM's own web pages or a link to a known reputable external group
- Support those users adding material(s) to categorise them in a simple and consistent way. Such users will include:
  - NCRM staff
  - Any training provider adding training items to the website
  - Authors of any articles, papers or presentations being uploaded to EPrints
  - Users from a range of disciplines
- Enable analysis of activity for both uploading and searches to inform future areas of research and training

## Why the need for development?

There are three main reasons for developing the existing typology 10 years after it was created. Firstly, advances within research methods and research methods technologies means the typology needs updating to make it more relevant to today's landscape.

Secondly, the function that the typology is required to perform has expanded and changed over time. The original typology was developed for use with a training events database, although there was the expectation that it could also be adapted for use with associated materials. This has since happened and the typology is now required to serve the many functions described above.

Finally, the original typology has not been found intuitive by those using it to upload items or to search for them, leading to inconsistency in its use. Analysis of the typology terms selected to label 'training and event' and EPrints items revealed that especially for training, the selections were frequently inappropriate. For example, users selected every single typology term or conversely only one or none at all. The EPrints items were more consistently labelled, perhaps they were more likely to be uploaded by the author, but for the training and events items uploading might be performed by another academic or an administrator. As well as selecting terms from the typology, those uploading items can add free or uncontrolled keywords. Analysis of these showed a lot of overlap with terms in the typology, suggesting that the typology was not well understood. NCRM hub members, who use the typology and can be considered research methods experts, were asked for feedback on how they use the typology. Two reasons for the lack of consistent use were identified:

1. The lack of certain terms and the form some take, for example, 'questioning' not 'questionnaire'. Users are unable to locate the term they would like to use, predominantly because the typology does not include the level of detail they are seeking.
2. The lack of guidance or explanation on how to select/apply terms, other than in the original document, means that some staff may not be clear on the overall structure or its conceptual nature. Currently the full typology can only be viewed by downloading the Beissel-Durrant (2004) report from EPrints and there is no direct link to this from the upload pages.

To enable the on-going analysis of events and materials requires a 'structure' that has a degree of consistency. The typology provides this through use of controlled terminology. However, there is a need to develop the 2004 typology to improve consistency of use, compliance and understanding while bearing in mind that the typology should not be too time consuming or onerous for users.

## What are the characteristics of an ideal typology?

Having outlined the specific needs of the NCRM typology, it was beneficial to consider important attributes of typologies more broadly, highlighting areas in which the original and updated typologies are in accord with, or deviate from other typologies. Denford (2013, p.177-178), drawing on earlier work, suggests that in an ideal typology: classes formed should aim to be exhaustive and mutually exclusive (Hambrick, 1984); typologies are often based on multiple dimensions to meet this rule (Bailey, 1994); typologies contain constructs, hypothesize relationships between constructs and are falsifiable (Doty and Glick, 1994). Evaluation of the success of a typology is based on the category labels being meaningful, the logic of the dimensions being clear and the ability to completely and exhaustively classify being demonstrable (Gregor, 2006). In an ideal research methods typology, every conceivable research method could be placed within the typology structure and ascribed to a single heading and the structure would be agreed by the wider social sciences community based on understood theories and practices.

As already outlined, the original 2004 typology does not meet these ideals, with social science researchers finding it difficult to consistently allocate a particular method to a relevant typology heading. Updating the typology needed to align it more closely with these ideals, but bearing in mind that research methods is a large, constantly evolving and often disputed field, meeting all these ideals was not realistic.

Ayres and Knafle (2008) assert that typologies should not be hierarchical, but rather categories should be related to one another, rather than some being subsidiary to others. This is at odds with the 2004 typology, which utilises a hierarchical structure, with headings and subheadings. The theoretical ideal conflicts with the practical consideration as to how a typology might be understood and navigated, particularly online and in searches. A 'flat' relational approach is more difficult to explain and display than a branching hierarchical one.

The criteria for a good classification are exhaustiveness and mutual exclusiveness (Du Toit, 2010). Du Toit (2010) suggests that a typology needs to be a reflection on methodologies used within a discipline and draws on Teddlie and Tashakkori (2006) five benefits of a typology in the area of mixed method research design. Of these the first three are most relevant to the NCRM typology, and are summarised as:

1. Help researchers decide how to proceed
2. Establish a common language for the field
3. Provide the field with organisational structure

The updated NCRM typology needs to meet these broader aims relating to supporting the wider research community by providing a coherent frame of reference.

## Is a typology the best approach – what about tagging?

As well as considering a more classic form of labelling using a fixed typology, new approaches were also explored, in particular, that of tagging. In the Web2.0 environment, algorithm-based searching has been used in favour of structured systems such as classification schemes, controlled vocabulary and subject headings. Searching has appeared to work well with many being satisfied with the search result they retrieve. However, Mann (2008) suggests that there is a difference between this fast information seeking approach and the requirements of scholarly retrieval where range, extent and depth are important, not just immediate results. The Web2.0 environment enables the use of tagging, whereby users are able to assign a non-hierarchical term or keyword to an item. The use of tagging has brought about user-generated classification of web-based resources, coined 'folksonomy' by Thomas Vander Wal (Derntl et al., 2011) in 2004, but also referred to as collaborative tagging or social indexing. In order to create an indexing and search system for online items that reflect the common language and the wealth of expertise of the research methods community, the potential role of collective tagging was considered.

Relevant to the NCRM is the review by Gerolimos (2013) comparing the value of tagging in the library context to the use of structured subject headings and discussing the benefits and demerits of each system along with the possibility of a hybrid system. A significant problem is that tags can produce information or semantic noise (Suchanek et al., 2008, p.232), especially when these are subjective or personal tags (Lawson, 2009). While this noise can be reduced as more meaningful tags are added, significant inconsistencies would be likely to remain, for example between disciplines. Furthermore, it has been found that the skills and approaches of those doing the tagging are varied, with experts being more consistent and better than the novice tagger at identifying key points, ignoring unrelated or low relevance material. The NCRM needs to cater for a range of user experience, not only experts. Importantly, Lu and Kipp (2014) found that noise reduced the precision in retrieval, especially in single word searches. Effective retrieval is key to the NCRM website, so while it may be worth considering offering a tagging option to enhance the typology in some settings, it is unlikely that tags alone would be sufficient for the various needs currently faced by NCRM.

Considering this mixed approach, there has also been some work on the linking of folksonomies with ontologies to develop a range of hybrid systems (Derntl et al., 2011; Alves and Santanche, 2013; Gasevic et al., 2011). Tagging has particular value as it 'can be a valuable tool to keep a taxonomy up-to-date, and to make the experience of adding metadata easier and more enjoyable' (Reamy, 2007, p.36). While there are differences between a typology, taxonomy, folksonomy and subject headings, it would appear that there may be value in learning from these examples

and applying them to the NCRM typology as a way of further developing it for the future, but not to replace it.

## Should the typology become a 'gold standard' for research methods classification?

The original Beissel-Durrant (2004) paper has constantly been in the NCRM EPrints 'top 10' downloads. Data available shows that in 2013 it was retrieved from a wide range of locations – within and beyond the UK – suggesting a wider use is being made of the typology than its original NCRM-specific purposes.

The NCRM typology could be expanded and developed to become a 'gold' standard, further enhancing the development of research methodology within the social sciences through enabling researchers to identify possible methods, whether quantitative, qualitative or mixed.

### Level of detail and relationships between terms: Sophistication versus practicality

The ability to describe training courses, events or a publication item clearly and concisely is important in enabling discovery by users. The 2004 typology offers description at a conceptual level whereby typology categories and sub-categories tend to be fairly broad and general in nature, allowing similar material to be described together under umbrella headings. For example 'Data Handling and Data Analysis' is a main category and 'Quantitative Approaches' is a sub-category. It is often only at the second sub-level that more specific research method types are given, for example 'Regression Analysis'. The value in this is that it is less subject to 'fashion' and short lasting approaches, allowing searchers to find a variety of material within the same 'family'. A user could label any type of regression analysis, including linear, probit or logistic, as 'Regression Analysis'. However, feedback from NCRM members suggested researchers often do not to think in these terms, tending towards the specifics of their work and want to be able to describe the key elements in more detail. Someone teaching logistic regression wanted to label their course as such and not use the more general 'Regression Analysis'. This level of specificity would ideally sit in the descriptor and connected terms level referred to by Beissel-Durrant (2004), but this has not been incorporated into the typology in any formal method thus far. In both the Training and Events database and EPrints publications database the closest option has been the uncontrolled keywords fields. These keywords give a useful insight into the level of detail and range of terms that users would like to apply.

Adding a further level of detail must be weighed against the increased size of the typology and so the time taken to locate and select items from it. By including a further level, the number of usable terms within the typology is at least doubled. This adds to the time taken by users who are uploading materials to label their items. Therefore, while this development would resolve many issues, its implementation would need to be carefully considered to support users.

There is further value in being able to demonstrate the link between the descriptors, connected terms and the categories and sub-categories. For example 'models for binary data' is a term connected with logistic regression and so should be linked to it within the typology. The relationship can inform where an item sits amongst other elements and help in evaluating how relevant it may be to the enquirer's area of interest. The actual application of linked terms is dependent on the search function available. At the time of review, this differed between EPrints and the Training and Events database, with EPrints having slightly more functionality. It has been necessary to continually balance the functionality of presently-used databases with the longer-term validity of application of any amendments to the typology.

### Can the keyword input option be improved?

In the existing systems the keyword field is uncontrolled and not monitored. As with tags, noise is created within these fields by singular and plural usage, mistyping and different forms of the same root word being entered, for example, 'model', 'models' and 'modelling'. Although elements from the typology may be selected, they are frequently entered into the keyword field, rather than using the keywords for additional terms. Providing enhanced functionality, such as auto-completion or offering typology terms more prominently may also address issues around different word forms and inconsistent hyphenation (e.g. multi-level vs multilevel).

However, it is important to recognise that some keywords provide additional detail about the subject matter of the material and are not directly related to the research method itself. There will always be a place for these types of subject/content tags or keywords, especially in the EPrints repository as the number of deposited items increases.

## What options were considered?

There were a number of possibilities considered during the review of the typology. These ranged from maintaining the status quo through to developing a sophisticated resource similar to the Thesaurus of Social Research Methodology (van Logchem et al., 1996), mentioned in the original Beissel-Durrant (2004) paper, or the HASSET Humanities and Social Sciences Electronic Thesaurus (UK Data Archive, 2011). As a result of these considerations the following options were evaluated:

### Option 1 – Minor Adjustments

Retain the simplicity of the higher levels of the typology, avoid specificity within the typology itself and make use of separate keywords or tagging options to inform detailed searching. Make minor adjustments to the structure, to avoid a main heading and a (general) section using the same name. Provide guidance on how to use the typology.

### *Advantages*

- Current, familiar structure is retained
- No issue of retrospective matching of old to new terms
- Maintain existing level of compliance

### *Disadvantages*

- As the volume of material grows search results may hide relevant material due to the number retrieved without the means to refine the search further.
- May require the development of different background search functionality in order to retrieve both typology and keyword terms.

## Option 2 – Major Revision with expended terms

Move to an expanded and more detailed typology incorporating the descriptor level, related terms and synonyms. Make adjustments to the structure, expanding where required. Retain uncontrolled keyword option to capture new emerging trends and non-typology tags for retrieval purposes. Provide guidance on how to use the typology in all instances where it is in use.

### *Advantages*

- Would allow materials to be indexed in more detail
- More focussed searches and search results possible
- Approved terms will match more closely search strategies in general use

### *Disadvantages*

- More terms to select from may reduce compliance in adding terms
- More in-depth knowledge of the content required for uploading the training events or materials
- Continued work would be required in maintaining and accepting new terms

## Option 3 - Combine the existing structure of the typology with cloud tags

### *Advantages*

- People are increasingly familiar with the concept of tagging
- Can facilitate the introduction of emerging concepts
- No restriction on what can be added

### *Disadvantages*

- Loss of consistency
- Requires control over who adds terms and how many
- Tagging is often used for personal reasons, e.g. to flag material for reading later often as a single word – ‘toread’ or ‘thesischapter6’
- Work would be required in monitoring tags applied for adding to the accepted terms list

## Recommendations

After consultation with academic users, the NCRM IT and communications group and a university librarian, it was decided that the second option would best meet the requirements of an updated NCRM. The following recommendations were made:

1. Adopt the Option 2 approach to revision of the typology, but consider adding tag cloud feature at a later stage.
2. Reconfigure the current typology so the 'Main and subcategories' are presented as level 1 and level 2 headings only. Develop a 3rd level of headings similar to the descriptor terms as well as developing the connected and related terms.
3. Categories in the typology should be more conceptual in nature, with only the lowest level (Descriptor) having a level of specificity
4. Create practical guidance for use with the Training and Events database and EPrints. This would be embedded guidance on the input screens, or a link to a suitable resource.

## Revising the typology

Several approaches were used to revise and update the typology:

The NCRM investigators, who represent a broad range of methodological expertise, were provided with the original typology and asked to make comments, including items which they felt should be added, removed or edited. This expert advice was used to guide key areas of change.

Since 2004, when uploading events and items onto EPrints and the Training and events database, users have been able to select headings from the typology and also add freely typed keywords. As these users are the same or similar to those who will be using the system in future, keywords from the databases up to June 2014 were reviewed alongside the typology terms and titles of the items or event. The review assessed how often keywords appeared, were they a repeat of a typology category, subcategory or descriptor, a possible new term, related term synonym or some other term that was not suitable for inclusion in the typology (for example the name of a presenter or institution).

Sage Research Methods Online was used as a source of current research methods terms. Relevant terms not already included in the typology were added.

Once these three sources of keywords had been reviewed and new terms identified, these were added to the typology. The revised typology was again circulated within the NCRM for comment in July 2014, with questions regarding additions and structure changes targeted to areas of expertise. The authors resolved any queries and conflicts within the typology, aiming to ensure methods were linked but not repeated throughout the typology.

The full, updated typology is in Appendix 1.

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## Bibliography

ALVES, H. & SANTANCHE, A. 2013. Folksonomized ontology and the 3E steps technique to support ontology evolvement. *Journal of Web Semantics* [Online], 18(1): 19-30. Available: http://dx.doi.org/10.1016/j.websem.2012.07.004.

AYRES, L. & KNAFLE, K. A. 2008. Typological Analysis. *In:* GIVEN, L. M. (ed.) *Sage Encyclopedia of Qualitative Research Methods.* Thousand Oaks, CA: Sage. http://srmo.sagepub.com/view/sage-encyc-qualitative-research-methods/n472.xml

BAILEY, K. D. 1994. *Typologies and taxonomies : an introduction to classification techniques,* Thousand Oaks, Sage.

BEISSEL-DURRANT, G. 2004 *A typology of resarch methods within the social sciences,* Southampton: ESRC National Centre for Research Methods (NCRM), http://eprints.soton.ac.uk/id/eprint/34817.

DENFORD, J. S. 2013. Building knowledge: developing a knowledge-based dynamic capabilities typology. *Journal of Knowledge Management* [Online], 17(2): 175-194. Available: http://dx.doi.org/10.1108/13673271311315150.

DERNTL, M., HAMPEL, T., MOTSCHNIG-PITRIK, R. & PITNER, T. 2011. Inclusive social tagging and its support in Web 2.0 services. *Computers in Human Behavior* [Online], 27(4): 1460 - 1466. Available: http://dx.doi.org/10.1016/j.chb.2010.09.014.

DOTY, D. H. & GLICK, W. H. 1994. Typologies as a unique form of theory building: Toward improved understanding and modeling. *Academy of Management Review* [Online], 19(2): 230-251. Available: http://dx.doi.org/10.5465/AMR.1994.9410210748.

DU TOIT, J. L. 2010. *A typology of designs for social research in the built environment.* Stellenbosch : University of Stellenbosch. 2010-10-26T15:22:20Z, http://hdl.handle.net/10019.1/5142.

GASEVIC, D., ZOUAQ, A., TORNIAI, C., JOVANOVIC, J. & HATALA, M. 2011. An Approach to Folksonomy-Based Ontology Maintenance for Learning Environments. *IEEE Transactions on Learning Technologies* [Online], 4(4): 301-314. Available: http://dx.doi.org/10.1109/TLT.2011.21.

GEROLIMOS, M. 2013. Tagging for Libraries: A Review of the Effectiveness of Tagging Systems for Library Catalogs. *Journal of Library Metadata* [Online], 13(1): 36-58. Available: http://dx.doi.org/10.1080/19386389.2013.778730.

GREGOR, S. 2006. The nature of theory in information systems. *MIS Quarterly* [Online], 30(3): 611-642. Available: http://www.jstor.org/stable/25148742.

HAMBRICK, D. C. 1984. Taxonomic Approaches to Studying Strategy: Some Conceptual and Methodological Issues. *Journal of Management,* 10(1): 27.

LAWSON, K. G. 2009. Mining Social Tagging Data for Enhanced Subject Access for Readers and Researchers. *Journal of Academic Librarianship* [Online], 35(6): 574-582. Available: http://dx.doi.org/10.1016/j.acalib.2009.08.020.

LU, K. & KIPP, M. E. I. 2014. Understanding the retrieval effectiveness of collaborative tags and author keywords in different retrieval environments: An experimental study on medical collections. *Journal of the Association for Information Science & Technology* [Online], 65(3): 483-500. Available: http://dx.doi.org/10.1002/asi.22985.

MANN, T. 2008. The peloponnesian war and the future of reference, cataloging, and scholarship in research Libraries. *Journal of Library Metadata* [Online], 8(1): 53-100. Available: http://dx.doi.org/10.1300/J517v08n01_06.

REAMY, T. 2007. Taxonomy Development Advice. *AIIM E-DOC* [Online], 21(6): 35-37. Available: http://www.kapsgroup.com/presentations/EDOCNov-Dec07-TaxonomyDevAdvice.pdf.

SUCHANEK, F. M., VOJNOVIĆ, M. & GUNAWARDENA, D. Social tags: Meaning and suggestions. International Conference on Information and Knowledge Management, Proceedings, 2008, October 26-30 2008 Napa Valley, California, USA. ACM, 223-232. http://dx.doi.org/10.1145/1458082.1458114

TEDDLIE, C. & TASHAKKORI, A. 2006. A general typology of research designs featuring mixed methods. *Research in the Schools* [Online], 13(1): 12-28. Available: http://www.msera.org/Rits_131/Teddlie_Tashakkori_131.pdf.

UK DATA ARCHIVE 2011 *HASSET Thesaurus (3.0),* http://www.data-archive.ac.uk/find/hasset-thesaurus

VAN LOGCHEM, M., KANTEBEEN, G. W., REENDERS, A. H. & HOOGENBOOM, J. M. A. 1996. *Thesaurus of Social Research Methodology,* Rotterdam, SRM-Documentation Centre, Erasmus Universiteit Rotterdam.

## Appendix 1: Updated NCRM Research Methods Typology 2014

| Level 1 Categories | Level 2 | Level 3 | Connected Terms (synonyms) | Related Terms |
|---|---|---|---|---|
| **Frameworks for Research and Research Designs** | | | | |
| | Epistemology | Philosophy of social science;<br>Critical theory;<br>Feminist methods;<br>Humanistic methods;<br>Interpretivism;<br>Positivism;<br>Postmodernism;<br>Poststructuralism | | |
| | Descriptive Research | | | |
| | Exploratory Research | | | |
| | Explanatory Research and Causal analysis | | Causal analysis;<br>Causal Inference;<br>Causal methods | |
| | Comparative and Cross National Research | Cross-national research;<br>Cross-cultural research;<br>Comparative research;<br>Historical comparative research | | |
| | Survey Research | | | |
| | Cross-Sectional Research | Repeated cross-sections | Cross-sectional time-series | |

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|---|---|---|---|---|
| | Longitudinal Research | Panel survey;<br>Cohort study;<br>Qualitative longitudinal research (QLR);<br>Mixed methods longitudinal research | Repeated measures | Forecasting |
| | Experimental Research | Experimental design;<br>Laboratory studies;<br>Randomized Control Trials (RCT) | | Hypothesis Testing Research |
| | Quasi-Experimental Research | Case-control studies;<br>Difference-in-differences (DID);<br>Paired comparison;<br>Instrumental variables;<br>Regression discontinuity;<br>Twin studies | Pairwise comparison | |
| | Evaluation Research | Policy evaluation;<br>Consumer satisfaction;<br>Theory of change methods | | |
| | Case Study | | | |
| | Pilot Study | | | Pretesting questionnaire;<br>Cognitive testing |
| | Participatory Research | Child-led research;<br>Emancipatory research;<br>Inclusive research;<br>Indigenous methodology;<br>Participatory Action Research (PAR); | | |

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|---|---|---|---|---|
| | | User engagement | | |
| | Action Research | Participatory Action Research (PAR) | | |
| | Ethnographic Research | | Ethnomethodology | |
| | Behavioural Research | | | |
| | Meta-Analysis | Mantel-Haenszel methods | | |
| | Systematic Review | | | |
| | Secondary Analysis | Archival research;<br>Documentary research;<br>Analysis of official statistics;<br>Analysis of existing survey data;<br>Analysis of administrative data;<br>Analysis of secondary qualitative data | Archiving;<br>Census Analysis | Meta analysis |
| | Digital Social Research | Online qualitative fieldwork;<br>Analysis of social media;<br>Big data analytics;<br>Online experimental research | Online surveys | |
| | Mixed Methods | Multi-strategy research;<br>Mixing qualitative and quantitative approaches;<br>Convergent designs;<br>Embedded designs;<br>Multiphase designs;<br>Parallel designs | Multiple method research;<br>Concurrent designs;<br>Nested designs | |
| | Interdisciplinary and Multidisciplinary Research | | Interdisciplinarity | |

| | | | | |
|---|---|---|---|---|
| | Frameworks for Research and Research Designs (other) | Hypothesis testing research;<br>Intervention studies | | |
| **Data Collection** | | | | |
| | Sampling | Survey sampling ;<br>Qualitative sampling;<br>Probability sampling methods;<br>Non-probability sampling ;<br>Respondent Driven ;<br>Sampling (RDS);<br>Distance sampling | Cluster sampling;<br>Stratified sampling;<br>Simple-random-sampling;<br>Quota sampling;<br>Snowball sampling;<br>Multistage sampling;<br>Complex survey designs | |
| | Participant Recruitment | Hard to reach populations;<br>Excluded/marginalised populations;<br>Gatekeepers | | |
| | Survey and Questionnaire Design | Questionnaire design;<br>Pretesting questionnaire;<br>Cognitive testing;<br>Face-to-face survey interview;<br>Telephone/video call survey interview;<br>Self-completed questionnaire;<br>Postal questionnaire;<br>Online questionnaire;<br>Open-ended questions;<br>Assessment instruments;<br>Design of scales | Question design;<br><br>Cognitive Interviewing;<br>Postal survey;<br>Mail survey ;<br>Email survey;<br>Web survey ;<br>Web-based questionnaire;<br>Opinion polls; | |
| | Diary Methods | | | |

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|---|---|---|---|---|
| | Qualitative Interviewing | Qualitative interview design;<br>Focus groups;<br>Face-to-face qualitative interviewing;<br>Qualitative telephone/video call interviewing;<br>Email/online qualitative interviews;<br>Self-interviews;<br>Walking interviews;<br>Vignettes;<br>Recording interviews;<br>Videoing interviews;<br>Unstructured interviews;<br>Semi-structured interviews;<br>Structured interviews;<br>Transcribing | Group interviews;<br>In-depth interviews;<br>Depth interviews;<br><br>Qualitative Interview Schedule Design;<br><br>Standardised qualitative interviews | Questionnaires |
| | Observation | Structured observation;<br>Unstructured/ ethnographic observation;<br>Real time and video observation;<br>Participant observation ;<br>Non-participant observation;<br>Mass observation;<br>Laboratory observation | Field observation;<br>Field experimentation | |
| | Biometric Data Collection | | | |
| | Delphi Technique | | | |
| | Visual Methods | Arts-based methods;<br>Photographic research;<br>Video research | Kineikonic mode;<br>Video fieldwork | |

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|---|---|---|---|---|
| | Multimodal Research | Kineikonic mode | Multimodality | |
| | Online Data Collection | Big data;<br>Mobile digital data;<br>Online communities;<br>Social media data | E-social science;<br>Online forums | |
| | Data Collection (other) | | Data capture;<br>Fieldnotes | |
| **Data Quality and Data Management** | | | | |
| | Data Management | Data archiving;<br>Data governance;<br>Data management plans;<br>Data security;<br>Encryption;<br>File-sharing;<br>Information management;<br>Sensitive data | | |
| | Quality in Qualitative Research | Catalytic validity;<br>Reflexivity;<br>Transparency;<br>Trustworthiness | | |
| | Quality in Quantitative Research | Reliability;<br>Validity;<br>Total survey error;<br>Evaluation of research | Construct validity | |
| | Measurement Error | Random measurement error;<br>Systematic measurement error;<br>Mode effects;<br>Multitrait multimethod; | Measurement error models;<br>Survey error reduction; | |

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|---|---|---|---|---|
| | | Satisficing | Validation studies;<br>Multi-trait multi-method | |
| | Data Editing | Variable recoding | | |
| | Nonresponse | Missing data;<br>Unit nonresponse;<br>Item nonresponse;<br>Imputation;<br>Weighting | Multiple imputation | |
| | Statistical Disclosure Control | | Privacy;<br>Confidentiality | |
| | Data Quality and Data Management (other) | | | |
| **Qualitative Data Handling and Data Analysis** | | | | |
| | Discourse Analysis | Discursive analysis;<br>Metaphor analysis | | |
| | Interaction Analysis | | | |
| | Conversation Analysis | Voice-centred relational method | | |
| | Content Analysis | | | |
| | Narrative Methods | | | |
| | Analysis of Composite Data | | | |
| | Corpus Analysis | | | |
| | Documentary Analysis | Semiotic analysis | | |

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| | Biographical Methods/Oral History | | Life;<br>Life course;<br>Life events;<br>Story/ Story telling;<br>Memory research | Autoethnography |
| | Grounded Theory | | | |
| | Ethnography | Autoethnography;<br>Hypermedia ethnography | | |
| | Phenomenology | Interpretative Phenomenological Analysis (IPA) | | |
| | Visual Methods | | | |
| | Thematic Analysis | | | |
| | Framework Analysis | | | |
| | Qualitative Longitudinal Analysis | | | |
| | Multimodal Analysis | | | |
| | Attributional Analysis | | | |
| | Actor Network Theory | | | |
| | Textual Analysis | | | |
| | Qualitative Comparative Analysis | | | |
| | Qualitative Data Coding | | Video coding | |
| | Qualitative Approaches (other) | | | |

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| **Quantitative Data Handling and Data Analysis** | | | | |
| | Descriptive Statistics | Correlation;<br>Effect size ;<br>Levels of measurement;<br>Variance estimation | | |
| | Statistical Theory and Methods of Inference | Probability theory;<br>Power analysis;<br>Parametric statistics;<br>Non-parametric statistics;<br>Bayesian methods;<br>Markov Chain Monte Carlo (MCMC) | | |
| | Small Area Estimation | M-Quantile models;<br>Multilevel models;<br>Spatial microsimulation; | Multi-level models;<br>Hierarchical models;<br>Microsimulation | Statistical Theory and Methods of Inference |
| | Microdata Methods | Data linkage;<br>Micro-econometrics | | |
| | Regression Methods | Ordinary least squares (OLS);<br>Generalized liner model (GLM);<br>Generalized least squares (GLS);<br>ANOVA;<br>ANCOVA;<br>Linear regression;<br>Log-linear regression;<br>Logistic regression;<br>Probit regression;<br>Discrete choice/count models; | Models for binary data;<br>Bivariate dynamic probit models | Non-Parametric Approaches; |

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| | | Instrumental variables estimation;<br>Heteroskedasticity;<br>Poisson regression;<br>Rasch modelling;<br>Additive intensity model;<br>Ordinal regression;<br>Regression discontinuity;<br>Categorical data analysis | | |
| | Multilevel Modelling | Hierarchical models;<br>Mixed models;<br>Random effects | Hierarchical linear modelling;<br>Multi-level model;<br>Nested data | |
| | Longitudinal Data Analysis | Panel data models;<br>Arrelano-Bond estimation;<br>Cross-lagged panel models;<br>Growth curve models;<br>Growth mixture models;<br>Latent class growth analysis | | |
| | Event History Analysis | Hazard analysis;<br>Survival analysis;<br>Duration analysis;<br>Poisson regression | Discrete time survival model;<br>Hazard model;<br>Survival model | |
| | Spatial Data Analysis | Point pattern analysis;<br>Network analysis;<br>Area-based analysis;<br>Surface modelling;<br>Geographical Information System (GIS);<br>Geodemographics;<br>Geographically weighted | Point source intervention;<br>Point process;<br>Point-process;<br>spatial analysis;<br>spatio-temporal;<br>spatio-temporal data; | |

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| | | regression;<br>Spatial distribution;<br>Spatio-temporal analysis | spatio-temporal process | |
| | Latent Variable Models | Graphical modelling;<br>Latent class analysis;<br>Latent profile analysis;<br>Latent trait analysis;<br>Principal components analysis;<br>Factor analysis;<br>Confirmatory factor analysis;<br>Structural equation models;<br>Rasch models;<br>Item response theory;<br>Correspondence analysis;<br>Cluster analysis | Dimensionality reduction;<br>Latency;<br>Latent class model;<br><br><br><br>Path Analysis | Psychometrics |
| | Time Series Analysis | Forecasting;<br>Space-time path | | |
| | Data Mining | Data fusion;<br>Neural networks;<br>Machine learning | | |
| | Simulation | Agent-based modelling;<br>Bootstrap simulation ;<br>Permutation tests | | |
| | Non-Parametric Approaches | Nonparametric maximum likelihood (NPML) | | Regression Analysis |
| | Econometrics | | | |
| | Q Methodology | | | |
| | Quantitative Approaches (other) | Boolean algebra;<br>Dynamic models; | | |

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| | | Formal logic;<br>Generalised Method of Moments (GMM);<br>Propensity score matching;<br>Sensitivity analysis;<br>Simultaneous equations models | | |
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| **Mixed Methods Data Handling and Data Analysis** | | | | Mixed methods designs |
| | Social Network Analysis | Interaction analysis | | |
| | Combining Qualitative and Quantitative Approaches | Complementary;<br>Integration;<br>Triangulation | | |
| | Mixed Methods Approaches (other) | | | |
| **ICT and Software** | | | Computing;<br>Computer package;<br>Software | |
| | Qualitative Software | ATLAS.ti;<br>Maxqda;<br>NVivo;<br>Transana;<br>Computer Aided Qualitative Analysis Software (CAQDAS) | | |
| | Quantitative Software | ArcGIS;<br>Excel;<br>MLwiN;<br>Mplus; | | |

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| | | Python;<br>R;<br>SAS;<br>SPSS;<br>Stata;<br>Winbugs | | |
| | Technology | Grid technology | | |
| | ICT and Software (other) | Latex | | |
| **Research Management and Impact** | | | | |
| | Research and Project Management | Change management;<br>Performance management;<br>Leading and chairing meetings;<br>Staff management;<br>Time management;<br>Recruitment and selection;<br>Coaching and mentoring skills | | |
| | Confidentiality and Anonymity | | | |
| | Research Ethics | | | |
| | Research Policy | | | |
| | Evidence-Based Policy and Practice | | | |
| | Management of User Involvement | | | |
| | Consultancy Skills | Client or user relationship | | |

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| | Regulatory and Legal Aspects | Copyright;<br>Data protection;<br>Intellectual property;<br>Plagiarism;<br>Research governance | | |
| | Research Management and Impact (other) | | | |
| **Research Skills, Communication and Dissemination** | | | | |
| | Researching Literature | Literature reviews | | |
| | Writing Skills | Grant applications;<br>Report writing;<br>Writing for publications;<br>Writing research blogs;<br>Disseminating with social media | Reporting on research | |
| | Conference Posters and Presentations | | Dissemination | |
| | Alternative Methods of Dissemination | Dissemination through Film and Video;<br>Dissemination through Poetry;<br>Dissemination through Theatre | | |
| | Data Visualisation | Creating graphs and charts;<br>Interactive data visualisation;<br>Mind maps | Mindmaps | |
| | Teaching and Supervising Research Methods | E-learning;<br>Webinars;<br>Blended learning; | Massive Open Online Course (MOOC) | |

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| | | Face-to-face/classroom learning;<br>Workshops;<br>Supervision of research students;<br>Training research methods teachers | | |
| | Research Skills, Communication and Dissemination (other) | Interviewer skills and training | | |