

THE USE OF MIXED METHODS RESEARCH IN THE FIELD OF BEHAVIOURAL SCIENCES

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Abstract

Mixed methods research involves the combined use of quantitative and qualitative methods in the same research study, and it is becoming increasingly important in several scientific areas. The aim of this paper is to review and compare through a mixed methods multiple-case study the application of this methodology in three reputable behavioural science journals: the *Journal of Organizational Behavior*, *Addictive Behaviors* and *Psicothema*. A quantitative analysis was carried out to review all the papers published in these journals during the period 2003-2008 and classify them into two blocks: theoretical and empirical, with the latter being further subdivided into three subtypes (quantitative, qualitative and mixed). A qualitative analysis determined the main characteristics of the mixed methods studies identified, in order to describe in more detail the ways in which the two methods are combined based on their purpose, priority, implementation and research design. From the journals selected, a total of 1.958 articles were analysed, the majority of which corresponded to empirical studies, with only a small number referring to research that used mixed methods. Nonetheless, mixed methods research does appear in all the behavioural science journals studied within the period selected, showing a range of designs, where the sequential equal weight mixed methods research design seems to stand out.

Keywords

Mixed methods research, Quantitative and qualitative methods, Research design, Behavioural sciences

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1 Introduction

The combination of quantitative and qualitative research methods in the same study, i.e. the use of mixed methods, is taking on greater importance (Tashakkori and Teddlie, 1998, 2003; Creswell, 2003). Although it started during the 1960s as a concept of mixing both main research methods (Leech and Onwuegbuzie, 2009), it has increased considerably over the last fifteen years in many disciplines, despite being criticized for violating quantitative and qualitative paradigmatic assumptions (Sale and Brazil, 2004). This methodological approach starts from the premise that it is often not necessary to choose between the two traditional strategies (quantitative *versus* qualitative), the idea being that it can be more fruitful to consider how the strengths of each can be combined within a mixed approach. As such, the use of mixed methods may play an important role in research, since the results obtained via the different methods can enrich and improve our understanding of the matters under study and foster fresh ideas about them, in order to give answers to questions that are difficult to answer by a sole classical method (quantitative or qualitative).

Creswell and Plano Clark (2007) note that the application and use of mixed methods has only been reviewed in a small number of disciplines, and it is therefore of interest to examine how it is being used in others. In this context the present study sought to analyse the use of mixed methods in the behavioural sciences, examining principally the specific designs used and the stated purposes of the studies that have used this approach and which have been published in three journals of reference in various fields of the behavioural sciences: the *Journal of Organizational Behavior*, *Addictive Behaviors* and *Psicothema*.

The paper is structured as follows. The next section describes several general aspects of the mixed methods approach, highlighting the main designs that can be used and the purposes which are usually sought. The following section describes the methodology used in carrying out the literature review and identifying the published studies that used mixed methods. The results section reports the main characteristics of these studies in each of the journals analysed. Finally, the results obtained are compared and a number of recommendations are made as regards future research.

2 Mixed methods research

The application of mixed methods research is on the rise in many disciplines. Some authors regard this approach as the third methodological movement (Tashakkori and Teddlie, 2003), one which complements purely quantitative or qualitative strategies. Indeed, mixed methods research has been the subject of books, articles and special editions of journals (see, for example, Morse, 1991; Morgan, 1998; Tashakkori and Teddlie, 1998, 2003; Creswell, 2003; Forthofer, 2003; Rallis and Rossman, 2003; Rocco et al., 2003; Ivankova, Creswell and Stick, 2006; Creswell and Plano Clark, 2007; Greene, 2007; Bergman, 2008; Teddlie and Tashakkori, 2009; Onwuegbuzie, Johnson and Collins, 2009; Plano Clark, Garrett and Leslie-Pelecky, 2010). Moreover, a number of journals focused specifically on mixed methods have appeared in recent years (*Journal of Mixed Methods Research* and the *International Journal of Multiple Research Approaches*). Studies based on this methodology include key words, typologies and purposes associated with mixed designs, and knowledge of these can make it easier to analyse these designs within behavioural sciences.

There are two main factors which can help determine the various types of mixed methods design (Morse, 1991; Morgan, 1998; Tashakkori and Teddlie, 1998; Creswell, 2003; Onwuegbuzie, Johnson and Collins, 2009):

- *Priority/weight/emphasis of approaches*. In a mixed methods study the researcher can give the same priority, weight or status to the quantitative and qualitative aspects (equal weight designs), or alternatively may give greater weight to one of them (different weight designs).

- *Implementation of data collection/time orientation*. This refers to the order in which the researcher collects quantitative and qualitative data. The two options are collecting information at the same time (simultaneous, concurrent or parallel designs) or obtaining data at different points (sequential or two-stage designs).

The way in which these two factors are combined will determine the resulting design. The notation proposed by Morse (1991) is useful for representing the different possible designs. In her system the abbreviations “quan” and “qual” are used to represent the quantitative and qualitative parts, respectively. When one method has greater weight than the other the former is shown in capitals letters (QUAN, QUAL), while the latter is written in lower case (quan, qual). Furthermore, the symbol “+” is used to indicate a

simultaneous design, whereas the arrow “→” refers to a sequential design. Therefore, the various combinations of data collection strategy and priority produce four blocks that give rise to nine mixed methods designs (Johnson and Onwuegbuzie, 2004):

- (a) Equal weight, simultaneous: (1) QUAL+QUAN.
- (b) Equal weight, sequential: (2) QUAL→QUAN; (3) QUAN→QUAL.
- (c) Different weight, simultaneous: (4) QUAL+quan; (5) QUAN+qual.
- (d) Different weight, sequential: (6) qual→QUAN; (7) QUAL→quan; (8) quan→QUAL; (9) QUAN→qual.

As regards the purpose of conducting mixed designs by integrating different types of data in the same study, several potential reasons have been noted by various authors (Greene, Caracelli and Graham, 1989; Morgan, 1998; Creswell, 2003). Two of the most widely stated reasons are triangulation and complementarity. The main aim of *triangulation* (Jick, 1979) is to achieve a convergence of the results obtained via the quantitative and qualitative approaches, such that these results are more reliable. What is sought, therefore, is a corroboration or correspondence of results obtained through different methods. Regarding *complementarity*, the main objective is to clarify or illustrate the results obtained with one method by also applying the other. In this case the designs used are usually sequential, for example, a QUAN→qual design, whereby the qualitative part may help to evaluate and interpret the results obtained from the main quantitative study. Another potential purpose of mixed methods research is *development*. In this case it is again usual to use sequential designs, in which one of the methods (normally the one with least weight) helps in some way to improve upon the subsequent implementation of the other method (normally the main or dominant one). For example, in a qual→QUAN study the qualitative part could help to develop theory, propose hypotheses, improve the quantitative instrument used for data collection and/or describe better the context so as to select specific variables and measures. A further purpose of mixed methods designs may be to enable *expansion*, i.e. seeking to analyse and explore different facets of a phenomenon so as to obtain a richer and more detailed understanding of it. For example, the quantitative part of a study may focus on fixed characteristics of a phenomenon, while the qualitative part addresses dynamic or process aspects.

3 Methods

3.1 Sampling scheme

This study was a mixed methods research to analyze the types of research studies published in reputable journals in the behavioural science field, specifically mixed methods publications, following Onwuegbuzie and Leech (2009) framework to identify an optimal sampling design. Identical samples from three journals were selected, using a sequential design where the quantitative first phase informed the second qualitative phase in order to identify and analyse the mixed methods designs used and the purposes being sought in this field. We conducted a literature review of the articles published in three peer-reviewed journals of reference covering different topics in this field: the *Journal of Organizational Behavior*, *Addictive Behaviors* and *Psicothema*. All articles published between 2003 and 2008 were used as our data, in order to determine the number of mixed methods studies that appeared during this period. The year 2003 is significant in the development of the mixed methods approach as it saw the publication of Tashakkori and Teddlie's *Handbook of Mixed Methods in Social and Behavioral Research*, which brought greater visibility and credibility to this approach.

3.2 Research design

Adapting Leech and Onwuegbuzie (2009) three-dimensional typology of mixed methods designs, our study was a partially mixed sequential equal status multiple-case study design (P3). It was considered as partially because it does not involve qualitative and quantitative research across all the research process components. In fact the quantitative and qualitative analyses were done separately. Besides the study has been considered a multiple-case study following Yin's case study approach (1993, 2003), for involving the choice of three journals (each one understood as single-case study) recognized as important in the behavioural science field, and treated equally in the same multiple subunits of analysis (the quantitative and qualitative ones) being an embedded case study. In the last step, the three study-cases were merged in a larger unit of analysis for their comparison. Specifically, in each single-case study (one journal), for the first quantitative phase a descriptive research design was used, detecting the following subunits of analysis: number of articles published per year, how many were non-

empirical articles and how many were empirical ones (quantitative, qualitative and mixed-methods articles). Subsequently, in each single-case study (one journal), the second qualitative phase involved the following subunits of analysis: determine the purpose (triangulation, complementarity, development and expansion), the priority (equal or different weights), the implementation (simultaneous or sequential) and the mixed-methods design (following notation proposed by Morse, 1991). Finally, in the current research it was expected that this partially mixed sequential equal status multiple-case study design will show a global picture of the mixed-methods designs more commonly used in the behavioural science field in these last years of publication.

3.3 Analysis

A Sequential Mixed Methods Analysis (SMMA; Onwuegbuzie and Teddlie, 2003; Tashakkori and Teddlie, 1998) was undertaken to analyze the research articles through analytic techniques in a sequential manner, in the quantitative and the qualitative phases described above. The purpose of this SMMA of a QUAN→QUAL design was development (Greene *et al.*, 1989; Morgan, 1998; Creswell, 2003), whereby the results from the first quantitative method informed the use of the other method.

An important aspect related to the identification of mixed methods studies is the search strategy used. In this study, all articles published in the three journals were read and reviewed. This strategy has been used in some previous reviews (Niglas, 2004; Powell, Mihalas, Onwuegbuzie, Suldo and Daley, 2008; Hart, Smith, Swars and Smith, 2009). An alternative strategy is the use of a list of search terms for mixed methods studies that are entered into electronic databases and journal archives. This search strategy has been used by previous studies (Creswell, Fetters and Ivankova, 2004; Hanson, Creswell, Plano Clark, Petska and Creswell, 2005; Plano Clark, 2005; Bryman, 2006; Plano Clark, Huddleston-Casas, Churchill, O'Neil Green and Garrett, 2008). The use of these different search strategies may provide different results. In fact, Bryman (2006), using an electronic search, pointed out that this search strategy may provide a biased sample of mixed methods studies in the sense that by no means all authors of articles reporting mixed methods research foreground the fact that the findings reported derive from a combination of quantitative and qualitative research, or do not do so in terms of the key words that drove the online search strategy. In summary, the search strategy used to find

mixed methods studies may influence the number of articles identified. Taking into account this important limitation of electronic search, we used the search strategy based on reviewing and reading all the articles published. In addition, this strategy enabled us not only to identify the mixed methods studies published, but also to classify all the articles into two broad groups, non-empirical and empirical, before sub-dividing the empirical studies into a further three categories: quantitative, qualitative and mixed. Having completed this classification the content of those articles reporting mixed methods was analysed, in each case determining the type of design used according to the priority and implementation assigned, as well as the main purpose of the study. All these aspects are described in the results section for each of the three journals, while the comparison between them is left for the discussion.

Mixed methods studies were normally identified through the information provided in the section of the paper referring to data collection and analysis. All the mixed methods studies were coded by the two authors (double coding) in order to determine their main characteristics as regards priority, implementation, type of design and purpose. The inter-coder reliability (measured by the percentage of agreement) was 80.5%. Any discrepancies were discussed and resolved by consensus.

4 Results

4.1 Journal of Organizational Behavior

4.1.1 Quantitative findings

This is the most important journal in the specific field of organisational behaviour. Its impact factor for 2008 according to the JCR (SSCI) was 2.441. The main topics addressed in this journal are related to different aspects of individual and group psychology and behaviour within organisations, with a frequent emphasis on how these aspects may influence the performance and profitability of companies. The most important research topics addressed include motivation, leadership, job satisfaction, the balance between professional and private life, work-related stress, the development of professional careers and the functioning of teams, among others.

As regards the research methods described in this journal there is a predominance of empirical studies using a quantitative methodology. Qualitative research is accepted, but

constitutes a minority approach. It should also be noted that, to date, no review has been conducted of the mixed methods studies published by this journal. Table 1 shows the distribution of articles by year and classified according to the type of study. As this journal is published eight times a year the present analysis covered 48 numbers, in which a total of 318 articles were published.

Table 1

It can be seen in the table that there is again a clear predominance of empirical studies (72.6%). Also as before, the majority of papers report using a quantitative methodology (62% of all articles and 85.3% of empirical studies). In this case there was an equal number of qualitative and mixed methods articles (seventeen each).

4.1.2 Qualitative findings

Table 2 shows the main characteristics of the seventeen mixed methods studies that were identified. The table shows that seven of these mixed methods studies gave equal weight to the quantitative and qualitative parts, while in the remaining ten priority was given to the quantitative aspect. As regards the implementation of data collection, four studies used a simultaneous strategy and thirteen a sequential approach. Analysis of priority and implementation in combination revealed empirical studies in three of the four main designs. Specifically, four articles reported a design of equal weight and simultaneous data collection (QUAL+QUAN), three used equal weight and a sequential strategy (two QUAN→QUAL and one QUAL→QUAN), and ten a design based on different weight and sequential implementation (seven qual→QUAN and three QUAN→qual). There were no designs involving different weight and simultaneous data collection.

Finally, as regards the purpose of using mixed methods the main objective (eight of seventeen studies) was development. The other stated purposes were, in descending order, complementarity (five studies), triangulation (three studies) and expansion (one study).

Table 2

4.2 Addictive Behaviors

4.2.1 Quantitative findings

This second journal was chosen due to it being one of the most widely recognised journals in the field of addictive behaviours at the international level. According to the JCR (SSCI) its impact factor for 2008 was 1.846. The journal focuses on human research in the area of substance abuse and includes both psychological and interdisciplinary studies. The most widely studied substances are alcohol and tobacco, among other drugs, and addictive behaviour is considered both in general and in specific groups (such as undergraduates, patients with a specific disorder, etc.).

As regards the predominant research methods that appear in this journal, quantitative empirical studies are once again the most common, with very little qualitative or mixed methods research being published. Table 3 shows the distribution of articles according to the same categories as were applied to the previous journal. In recent years this second journal has appeared monthly and thus, for the period studied, a total of 63 numbers were analysed, in which appeared 932 articles. As can be seen in Table 3, empirical articles accounted for 95.2% of those published, the large majority being quantitative in nature (94% of the total and 98.8% of empirical studies).

Table 3

4.2.2 Qualitative findings

Table 4 shows the main characteristics of the six mixed methods studies that were identified. As regards priority, five of these studies gave equal weight to the quantitative and qualitative parts. In terms of the implementation strategy, four studies used a simultaneous and two a sequential approach. Specifically, the design of four studies was equal weight and simultaneous data collection (QUAL+QUAN), one study used equal weight and a sequential strategy (QUAL→QUAN) and one gave different weight to the two methods under a sequential design (QUAN→qual). There were no designs involving different priority and simultaneous data collection.

Finally, as regards the purpose of the mixed methods studies, three articles had the objective of triangulation and three, complementarity.

Table 4

4.3 Psicothema

4.3.1 Quantitative findings

This is the most widely acknowledged journal in the field of the behavioural sciences in Spain. It features in the most important national and international scientific databases and the Journal Citation Reports (JCR) for 2008 give it an impact factor of 1.213 in the Social Science Citation Index (SSCI). The journal mainly publishes research articles, both basic and applied, in any area of psychology, regardless of the approach or theoretical orientation. However, the method and data analysis used must show rigour and contribute to the development of scientific knowledge in the discipline. The methodological topics that appear most often in the journal's articles are psychometrics, advanced statistics and research designs. As regards substantive topics in psychology, the journal has published a wide range of papers, including studies in clinical, developmental, educational and social psychology, as well as advances in new, more specific and innovative fields of psychology.

The analysis here revealed a predominance of empirical studies, which mainly used a quantitative methodology. Qualitative studies were in the minority, being similar in number to reports concerning mixed methods (Table 5).

Table 5

4.3.2 Qualitative findings

Table 5 shows this clear trend in favour of the quantitative approach and empirical studies. A number of general aspects should also be considered when interpreting this finding. Firstly, the journal is published quarterly (with an occasional annual supplement, as in the case of 2006), and there can be as many as thirty articles in each number. For the period studied here a total of 708 articles were analysed, of which 88.6% were empirical. Articles using a quantitative methodology accounted for 85.9% of the total and 97% of the empirical papers, illustrating that this is clearly the majority approach. In contrast, only a small number of articles used a qualitative approach or mixed methods.

The nine articles that referred to mixed methods had the following methodological characteristics (Table 6). As regards priority, six gave equal weight to the quantitative

and qualitative parts of the study, while the remaining three prioritised one over the other (the predominant method being the quantitative approach). With respect to the implementation of data collection, two studies did so simultaneously while the remaining seven used a sequential strategy. The analysis of how priority and implementation were combined revealed two studies whose design was equal weight and simultaneous implementation (QUAL+QUAN), four designs based on equal weight and sequential data collection (QUAL→QUAN) and three with different weight (once again in favour of the quantitative approach) and sequential implementation (qual→QUAN).

Finally, two main purposes were identified: development, in seven articles, and expansion in the remaining two.

Table 6

5 Discussion and conclusions

5.1 Comparison of the journals

The comparison of results is shown in Table 7, which gives the main data for each journal in order to show the evidence from multiple cases to draw cross-case conclusion of this mixed methods research. This reveals a clear predominance of empirical studies (89.1%) over theoretical papers (10.9%). *Addictive Behaviors* is the journal which publishes, in line with its editorial policy, the most empirical articles, followed by *Psicothema* and the *Journal of Organizational Behavior*. It can also be seen that most of the articles are quantitative in nature (85.7%), with only a small number of qualitative and mixed methods studies being published (1.7% in each case). This comparison confirms that in recent years these journals in these areas of the behavioural sciences mainly publish empirical studies that are almost always conducted using a quantitative methodology.

Table 7

As regards the studies that used both quantitative and qualitative methods, Table 8 shows the characteristics of these mixed designs, as well as their stated methodological purpose. In the *Journal of Organizational Behavior* a total of seventeen articles were identified, a design giving different weight to the two methods being slightly more common than the equal weight approach. Data were generally collected using a sequential strategy. As regards the stated purpose of using mixed methods all four categories (development, triangulation, complementarity and expansion) were represented in this journal. In *Addictive Behaviors* six mixed methods articles were identified, the most common design being one that gave equal weight to the two methods, combined with simultaneous data collection. The stated purposes were triangulation (which seeks corroboration and convergence between the two methods) and complementarity (which aims to elaborate, illustrate and clarify the results of one method through the findings of the other). Finally, a total of nine articles were found in the journal *Psicothema*, the most common design being one that gave equal weight to the quantitative and qualitative aspects, combined with a sequential data collection. The stated purposes of using mixed methods were mainly development (i.e. using the results of one method to help generate and apply the other method subsequently) and expansion (which involves broadening the research question by using different methods for its different components).

In summary, it seems that mixed methods research is still little known and/or used, as qualitative methods research in the behavioural science field. Furthermore, when this methodological approach is selected for a study, the research design seems to be a sequential equal weight mixed methods research design.

Table 8

This mixed methods multiple-case study research has had the potentiality to describe each single-case study first quantitatively and after qualitatively, letting us establish the comparison between cases in relation to their quantitative subunits of analysis (number of non empirical and empirical studies –quantitative, qualitative and mixed-), and within cases of each journal in relation to its qualitative subunits of analysis (observing main characteristics of mixed methods research articles published). These multiple evidences make the overall study more robust than a single-case study design, following “replication” logic similar to multiple experiments (Yin, 2003), in the sense that case-

to-case operates as a generalization that could be understood as an accumulation of evidence to the population of articles published in reputable behavioural sciences journals (following Onwuegbuzie, 2003). Three literal replications were made, because journals selected had similar characteristics (field of knowledge, international recognition, they were peer-reviewed and they had reputation established by their impact factor index).

To conclude this section it should be noted that only one of the mixed methods studies that were identified in the three journals (namely, the paper by Challiol and Mignonac (2005) in the *Journal of Organizational Behavior*) cited a methodological study about mixed methods (specifically, the study by Greene, Caracelli and Graham [1989]). This suggests that the mixed methods approach is not very familiar to researchers in these areas of the behavioural sciences and, as such, its potential and the possibilities it offers in terms of the purposes discussed here may not be taken full advantage of.

5.2 Recommendations and future research

Conducting mixed methods research in the behavioural sciences may help to understand certain aspects of studies that have already been carried out in this and other fields. In this regard, Creswell, Plano Clark, Gutmann and Hanson (2003) point out that a central challenge for mixed methods research is the explicit clarification of several key aspects. Firstly, researchers should clearly identify the main purposes of using a mixed design that includes both quantitative and qualitative data. Furthermore, it is necessary to clarify the factors analysed in the present paper when determining the type of design. Thus, with respect to the issue of priority, researchers must clearly describe the decisions made when assigning the respective weight (equal or different) to the quantitative and qualitative parts, which could be reflected in the length and depth of the comments and discussions made regarding each of the approaches. In relation to the implementation of data collection, researchers should clearly specify whether the design is sequential or simultaneous. For example, if the design is sequential the two stages of data collection and analysis could be presented in separate sections, before integrating the findings in the discussion and/or conclusions of the paper. Given the complexity of

these aspects, researchers may find it useful to present their results with the help of figures or visual models (Ivankova, Creswell and Stick, 2006).

It should also be remembered that although a particular design may be initially proposed for a given study, new aspects or ideas may emerge as the research progresses, and this could lead to the original design being modified. As such, researchers should be creative and not restrict themselves to pre-existing designs; indeed, they may even need to create new designs that are suitable for the research questions being considered. In this context, while sequential mixed designs usually have two parts they may be more complex and require three or more stages (Johnson and Onwuegbuzie, 2004; Teddlie and Tashakkori, 2006). Furthermore, the present research design typologies in the mixed methods approach could be still improved containing case study design research to attend the complexity of the combination of qualitative and quantitative methods in the same study, as a single-case study or as an instrumental (Onwuegbuzie & Leech, 2009) or multiple-case study mixed methods research. In order to do a cross-case analyses and to improve, at least to some degree, the generalization through replication, although more must be done in this field of knowledge and others were mixed methods research are starting to be used as a new methodological option.

In our opinion it would be interesting to conduct further reviews covering both a broader time period and other journals so as to obtain a more detailed picture of how mixed methods research is being applied. Indeed, such research may help to promote the use of mixed methods in the behavioural sciences. At all events, researchers need to be aware of the extent to which this approach is accepted within their respective areas, and is being used by their colleagues. The present study has identified a number of mixed methods articles that could serve as a guide for future mixed methods studies.

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Table 1. Articles published in the *Journal of Organizational Behavior* (2003-2008)

Year	Number of articles	Number of non-empirical articles	Empirical articles			
			Number of empirical articles	Number of quantitative articles	Number of qualitative articles	Number of mixed articles
2003	50	10	40	40	0	0
2004	47	4	43	35	2	6
2005	50	18	32	28	1	3
2006	56	15	41	33	5	3
2007	55	20	35	27	5	3
2008	60	20	40	34	4	2
Total	318	87	231	197	17	17

Table 2. Characteristics of the mixed methods studies published in the *Journal of Organizational Behavior*

Article	Purpose	Priority	Implementation	Design
Lievens & De Paepe (2004)	Triangulation	Equal	Simultaneous	QUAL+QUAN
Wright (2004)	Development	QUAN	Sequential	qual→QUAN
Grandey et al. (2004)	Development	QUAN	Sequential	qual→QUAN
Patterson et al. (2004)	Development	Equal	Sequential	QUAL→QUAN
Leonard et al. (2004)	Complementarity	QUAN	Sequential	QUAN→qual
Lam & Dreher (2004)	Complementarity	QUAN	Sequential	QUAN→qual
Challiol & Mignonac (2005)	Triangulation	Equal	Simultaneous	QUAL+QUAN
Ostroff et al. (2005)	Development	QUAN	Sequential	qual→QUAN
Levy (2005)	Development	QUAN	Sequential	qual→QUAN
Donnelly & Quirin (2006)	Triangulation	Equal	Simultaneous	QUAL+QUAN
Rafaeli (2006)	Expansion	Equal	Simultaneous	QUAL+QUAN
Nembhard & Edmondson (2006)	Development	QUAN	Sequential	qual→QUAN
Liu et al. (2007)	Complementarity	Equal	Sequential	QUAN→QUAL
Drach-Zahavy & Freund (2007)	Development	QUAN	Sequential	qual→QUAN
Nielsen et al. (2007)	Complementarity	QUAN	Sequential	QUAN→qual
Lilius et al. (2008)	Complementarity	Equal	Sequential	QUAN→QUAL
Caldwell et al. (2008)	Development	QUAN	Sequential	qual→QUAN

Table 3. Articles published in *Addictive Behaviors* (2003-2008)

Year	Number of articles	Number of non-empirical articles	Empirical articles			
			Number of empirical articles	Number of quantitative articles	Number of qualitative articles	Number of mixed articles
2003	135	6	129	126	2	1
2004	191	12	179	179	0	0
2005	139	4	135	134	0	1
2006	155	8	147	143	2	2
2007	188	7	181	179	1	1
2008	124	8	116	115	0	1
Total	932	45	887	876	5	6

Table 4. Characteristics of the mixed methods studies published in *Addictive Behaviors*

Article	Purpose	Priority	Implementation	Design
Moore et al. (2003)	Complementarity	Equal	Simultaneous	QUAL+QUAN
Terry & Wright (2005)	Triangulation	Equal	Simultaneous	QUAL+QUAN
Nordqvist et al. (2006)	Triangulation	Equal	Simultaneous	QUAL+QUAN
Bradizza et al. (2006)	Triangulation	Equal	Simultaneous	QUAL+QUAN
Stotts et al. (2007)	Complementarity	Equal	Sequential	QUAL→QUAN
Acosta et al. (2008)	Complementarity	QUAN	Sequential	QUAN→qual

Table 5. Articles published in *Psicothema* (2003-2008)

Year	Number of articles	Number of non-empirical articles	Empirical articles			
			Number of empirical articles	Number of quantitative articles	Number of qualitative articles	Number of mixed articles
2003	101	12	89	82	3	4
2004	101	17	84	80	4	0
2005	106	14	92	87	2	3
2006	152	15	137	134	1	2
2007	102	13	89	89	0	0
2008	146	10	136	136	0	0
Total	708	81	627	608	10	9

Table 6. Characteristics of the mixed methods studies published in *Psicothema*

Article	Purpose	Priority	Implementation	Design
García & Fidalgo (2003)	Development	Equal	Sequential	QUAL→QUAN
Arce et al. (2003)	Development	Equal	Sequential	QUAL→QUAN
Aragónés et al. (2003)	Development	Equal	Sequential	QUAL→QUAN
Mallou et al. (2003)	Development	QUAN	Sequential	qual→QUAN
Arce et al. (2005)	Development	Equal	Sequential	QUAL→QUAN
Pérez-González & Williams (2005)	Expansion	Equal	Simultaneous	QUAL+QUAN
Rodríguez et al. (2005)	Development	QUAN	Sequential	qual→QUAN
Boyatzis (2006)	Development	QUAN	Sequential	qual→QUAN
Villar et al. (2006)	Expansion	Equal	Simultaneous	QUAL+QUAN

Table 7. Comparison of the articles published in the journals analysed (2003-2008)

Journals	Total number of articles	Number of non-empirical articles	Empirical articles			
			Number of empirical articles	Number of quantitative articles	Number of qualitative articles	Number of mixed articles
JOB	318	87 (27.4)	231 (72.6)	197 (62)	17 (5.3)	17 (5.3)
AB	932	45 (4.8)	887 (95.2)	876 (94)	5 (0.5)	6 (0.7)
<i>Psicothema</i>	708	81 (11.4)	627 (88.6)	608 (85.9)	10 (1.4)	9 (1.3)
TOTAL	1958	213 (10.9)	1745 (89.1)	1681 (85.7)	32 (1.7)	32 (1.7)

The numerical values inside the boxes are absolute frequencies and the values in parentheses are the percentage derived from the total in each case.

Table 8. Characteristics of the mixed methods studies analysed (2003-2008)

	Journals		
	JOB (17)	AB (6)	<i>Psicothema</i> (9)
Designs			
Equal weight	7 (41.2)	5 (83.3)	6 (66.7)
Different weight	10 (58.8)	1 (17.6)	3 (33.3)
Simultaneous	4 (23.5)	4 (66.7)	2 (22.2)
Sequential	13 (76.5)	2 (3.33)	7 (77.8)
Purpose			
Triangulation	3 (17.6)	3 (50)	0 (0)
Complementarity	5 (29.4)	3 (50)	0 (0)
Development	8 (47.1)	0 (0)	7 (77.8)
Expansion	1 (5.9)	0 (0)	2 (22.2)

The numerical values inside the boxes are absolute frequencies and the values in parentheses are the percentage derived from the total in each case.