

Chapter 2

Selecting an appropriate research strategy

Learning Objectives

By linking your understanding of sport in practice to sport-related research examples, this chapter is designed to help you:

- explain the importance of research strategy selection;
- describe and define the terms *research design* and *research methods*, exploring the range that can be accessed by the researcher;
- link these key concepts together in a logical and justified manner.

Introduction

Whether playing a round of golf, identifying the roles members of a team play when under pressure, or making a decisive race-winning breakaway, selecting the right research strategy will ensure that time and time again the correct preparation will lead to the selection of the most suitable approach and the desired outcome. The *research strategy* therefore is the logical set of principles that informs the researcher in the process of planning, managing and implementing a single or collection of research methods based on one or more research designs.

In Chapter 1, the two broad approaches to research were reviewed, that being positivistic from a natural science perspective and interpretivistic from a social science perspective. With each approach linked to a set of underpinning assumptions (i.e. paradigms) that impact on the nature of the research question, the selection of the most suitable strategy is a fundamental component to any project. Therefore before unravelling the intricacies of research design and method, the researcher must gain a wider appreciation as to the overarching strategies available. This provides a much more concrete link between the philosophical position of the research and the more pragmatic aspects of data collection and analysis.

Establishing a research strategy

A tennis player is two games away from winning the championship. Up 4–2 in the final set of a five-set thriller, the players return to their seats to work out their individual game plans. Drawing on

past experience and evaluating the opponent's strengths and weaknesses, each player works through their options in a logical and rational manner. Based on the objectives of their task, they systematically apply a logical set of principles (*research strategy*) that will shape their decisions. This will allow for a plan to be devised (*research design*). The player who is behind opts to attack the opponent's weakest shot – their backhand – with deep forehand ground shots (their plan). Holding the opponent deep in the court, would then allow for a surge to the net for a volley into the open court (*research methods*).

Reflection Point 2.1

In an excellent book that provides extensive advice on research planning, Blaikie in his text *Designing Social Research* makes a clear distinction between research strategy and other aspects of the research process that are often used synonymously and subsumed under the umbrella term of research methods.

- **Research strategy:** *A logic of inquiry (set of ground rules/principles that shapes the decisions we make when selecting and implementing our research design and methods).*
- **Research design:** *All aspects relating to the structure or plan by which data collection can occur.*
- **Research method:** *Execution of the project (incorporating the implementation of instruments, techniques and procedures used to collect data).*

Being able to establish a sense of order to these terms will help in planning the research process as outlined in Chapter 1. Before determining ethics, participant recruitment, protocol/instrument design, etc., the framework or research strategy must be determined and developed in accordance with the nature of the research question.

So the research strategy, which can comprise of one or more designs and one or more methods, is the logical manner by which the researcher shapes the data collection process. Viewing research in such a way allows the researcher to be confident that the strategy selected is best suited to answer the research question. This doesn't always mean that the findings will be what are expected, but it will provide confidence that the process and the logic of conducting the research are achieved in the most suitable way.

Recognising a research project's strategy

Each research project undertaken will inherently have a *research strategy* built within it. It is often the case however that most undergraduate research projects are formed without knowing the strategy

selected. The tendency of most is to jump-start into focusing on the research methods, developing questionnaires, constructing treadmill protocols, or structuring and planning interviews, for example. When identifying how to go about collecting data to answer the research question, the immediate concern often is centred on aspects of research construction and implementation, namely deciding on the design and methods and then conducting the study to collect and analyse the data (Chapter 1, Figure 1.2). Although incredibly important aspects of the research process and ones that need time and attention, initial emphasis for the researcher should be on recognising the research strategy.

By identifying this early in the research process, questioned and debated, and arguments built to support the choice, the researcher can be confident that the proceeding selection and evolvement of the design and methods can be built upon a logical framework that fits to the research question being asked. Without such research strategy or overall research orientation, it is difficult to have a clear direction from the start and decide on which design/methods would allow for effective data collection. The act of undertaking research and devising a strategy that is ultimately governed by the research problem will provide the philosophical and practical framework that supports the research process. It is important to recognise that the strategy selected will typically fit firmly into one of the ontological positions (i.e. objectivist or constructivist), the corresponding epistemology positions (i.e. positivist or interpretivist) and the linked methodological positions (i.e. quantitative or qualitative). Understanding these positions early in the research planning will help shape an opinion as to the strengths and limitations of the chosen strategy.

As outlined previously, questions we ask ourselves when deciding on our research approach relate to: i) what does our world consist of, and what constitutes reality (*our ontological position*); ii) what do we know about our world and how can we gain appropriate knowledge about it (*our epistemology position*); and iii) how are we going to go about acquiring the knowledge that is in our world (*our methodological position*). Each of these questions will lead us to make decisions that will have a direct influence on the research strategy. As outlined in Figure 2.1, ontological, epistemology and methodological positions can be broadly divided into contrasting paradigms. Each paradigm has its own logic and set of rules, governed by certain principles. Each will, to some extent, dictate the range of research designs and methods that allow for suitable data collection in order to establish knowledge in our world. It is important to recognise working through the figure in a logical direction (from left to right) enables the researcher to approach their design and method selection in a manner that ensures a broad awareness to their selected research positions. The choice of design and method are not an arbitrarily picked range of options, but systematically selected based on the paradigm, that is governed by both the researcher's own position and the research question.

Each chapter within this book has been carefully developed to help the researcher make the right decision based on the type of sport-related question(s) that may need answering. By working through the individual research strategies and their associated design(s) and method(s), the researcher will gain a sense of the philosophical and practice importance of each. In turn, this will aid in the implementation and interpretation of findings within the overall research process.

Problem-led versus strategy-led approaches

It is important to remember that research should always be problem-led and not strategy-led. This means that it should be the research problem that dictates the selection of a strategy, as the researcher should be searching for the most suitable approach to fully answer the question. Although it may be difficult, the researcher must view all approaches evenly without bias towards their own ontological position. It is by taking this approach that will lead to new questions being asked from perspectives and the creation of new opportunities of research that would otherwise be missed.

For the purposes of this book, research strategies have been broadly placed into seven distinct categories that incorporate ontological, epistemological, and methodological positions, as well as appropriate designs and suitable methods. Figure 2.1 provides a representation of the relationship between each position, research design and research methods. Systematic 'literature' review, experimental, correlational, survey, observational, ethnographic and case study research strategies are the most common types of research approaches the sports researcher will encounter throughout the course of studies. In some research projects more than one strategy may be used, but these tend to be larger research studies that begin with an exploratory phase, such as a systematic review or survey strategy, that may be inductive, followed by an explanatory phase, such as experimental research that

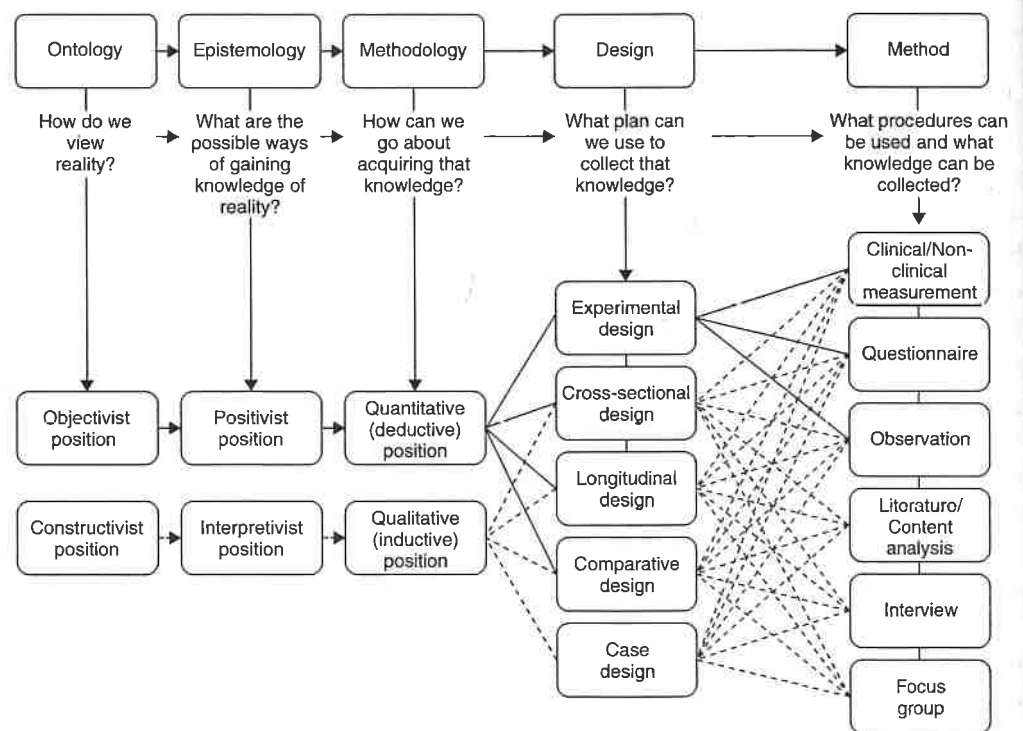


Figure 2.1: The building blocks of research provide a gateway to the design and methods we may choose in order to answer our research question.

would be deductive. The last chapter of the book deals with such 'mixed' approaches and explores ways in which the researcher can approach their research to develop the best approach.

The link between the research question and research strategy

The most important part of research is linking the question that has emerged to an appropriate research strategy. In reality, many research questions fit nicely into one of the seven strategies and the emerging design and methods can be easily deciphered, both by looking back at past research and through logical reasoning. As already mentioned, it is a common mistake to let the tail wag the dog – that is to say that the research strategy shapes the nature of the question. What is fundamental is that the dog wags the tail, so the research question dictates the selected strategy. It is important to recognise that the research question or problem the researcher develops can be answered via a number of different ways. Therefore, reviewing each approach, identifying the linked designs and methods (Figure 2.1), and considering the nature of the data the researcher wants to collect will provide the signpost to the most suitable strategy. The following sections should provide any researcher with a starting point in identifying each strategy and the type of questions that can be answered by each. It is important to remember, however, that some questions can be answered using a number of different strategies that may be applied independently or mixed. The nature of the question therefore will dictate whether one or more approaches are needed.

Systematic literature review research

The purpose of this research strategy is to identify, evaluate and interpret all available research (i.e. primary and secondary evidence) relevant to a particular research question, topic area, or phenomenon of interest. The reasons for undertaking this approach may be to: i) summarise existing evidence concerning a treatment, procedure or technology; ii) identify any gaps in the current research in order to suggest areas for further investigation; or iii) provide a framework in order to give recommendations or guidelines of best practice. Systematic literature reviews are particularly useful when there is uncertainty regarding potential benefits or harm of an intervention, such as the supposed performance-enhancing effect of ginseng or when there are wide variations in practice, such as recommended protein intake among strength and endurance athletes. By applying the systematic literature review process to provide empirical answers to focused questions, this strategy may also help in planning new primary research.

The types of questions that can be answered using this strategy may include:

- What research evidence exists that informs us as to safety guidelines when prescribing exercise programmes to post-operative patients?
- What protocol designs have been applied to evaluate incremental exercise in runners and how does each impact on measurement error?

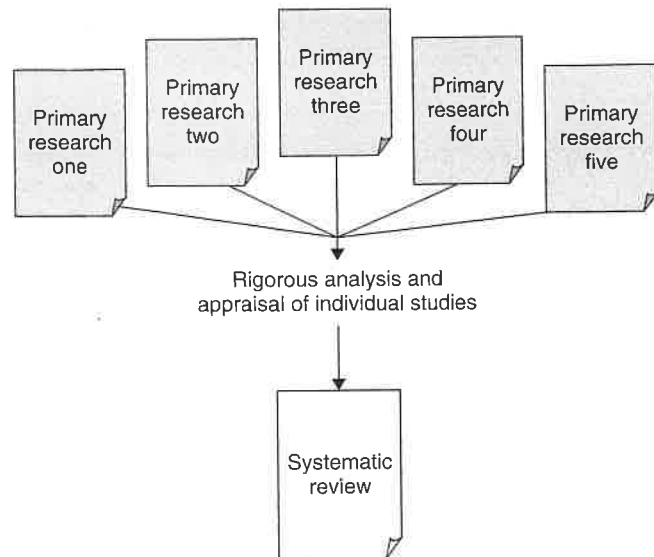


Figure 2.2: The systematic literature review strategy offers an opportunity to answer research questions by using a range of primary research evidence.

- What strategies have been documented that attempt to prevent injury prevalence in adolescent sport?
- What published research is available to generate recommendations for increasing participation in sport?

Research Focus 2.1

In a study by Brunner et al. (*Journal of Aging and Physical Activity*, 2007, 15: 336–48) a systematic literature review was conducted to determine the effects of aging on Type II muscle fibres in human skeletal muscles. In order to develop optimal strategies to prevent functional declines and promote efficient rehabilitation, such research review would aid understanding as to the age-related changes in muscles. The authors performed electronic searches in three widely accessed databases (Medline, PEDro and Science Citation Index) including all cross-sectional and longitudinal studies that were published as original journal articles. A range of defined search terms (e.g., aging muscle, Type II fibre, aging skeletal muscle) were used that corresponded with the research question. The focus of the search was on investigations of large limb or trunk muscles in older, healthy human adults who engaged in moderate physical activity. The authors excluded studies examining muscle groups other than large limb or trunk muscles and study populations including patients or subjects performing heavy physical activity. Two reviewers independently evaluated the full text of all retrieved articles using a standard scientific-paper-appraisal form. This form prompted the reviewers to record information regarding the study design, methodological features, analysis, clinical relevance, scientific merit, strengths, and weaknesses of each study. The two reviewers appraised studies for their relevance to the research question and the quality of evidence. All forms were collated and data presented.

Experimental research

The purpose of this research strategy is to compare cases under controlled conditions (e.g., laboratory or fixed environments) in order to establish causality. Causality refers to the relationship between the cause of something and the subsequent effect. Manipulating single phenomena while controlling all others allows the researcher to determine what may cause such effect. By establishing causality, the researcher is able to make generalities in support or refutation of a theory. Therefore, by attempting to establish cause and effect, this deductive approach sets out to test theory. The experimental research strategy fits firmly within the objectivist position and therefore confirms to the objectivity of measurement.

Typically characterised by an 'intervention/treatment' group and a 'control' group, this approach treats situations like a laboratory, attempting to control all confounding factors that may impact on the ability to establish causality. A range of experiment-specific research designs can be chosen and when combined with the large range of data collection methods available within the area of sport, varying approaches can be taken to answer specific research questions that wish to establish cause and effect.

The types of questions that can be answered using this strategy may include:

- What is the impact of a 6-week plyometric training programme of swim start performance in junior swimmers?
- Can an acute 2-week bout of imagery training improve target accuracy in expert pistol shooters?
- Does hypnosis prior to high-dive performance improve concentration and focus in elite competitors?

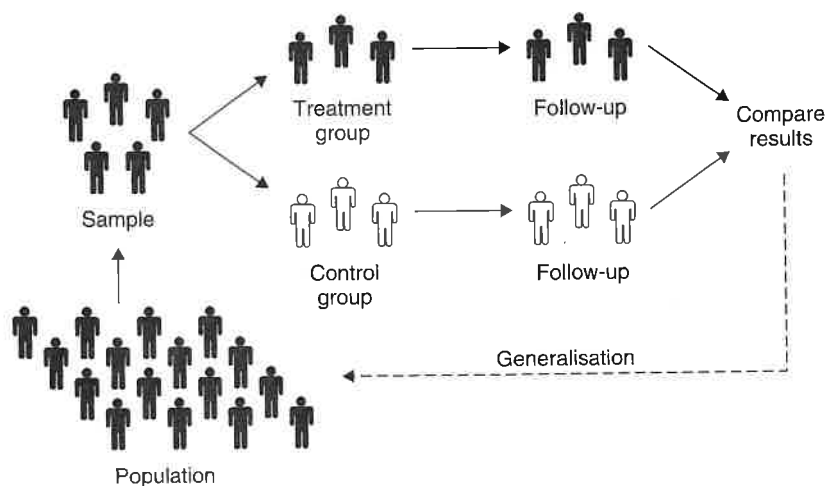


Figure 2.3: The experimental research strategy, as illustrated below with a between-group pre-post test design, establishes causality through the manipulation and control of variables.

Research Focus 2.2

In a study by Rollo et al. (*International Journal of Sport Nutrition and Exercise Metabolism*, 2008, 18: 585–600) an experimental research strategy was selected to examine the effect of a carbohydrate (CHO) mouth rinse on self-selected running speeds during a 30-minute treadmill run. Previous evidence had already supported the positive use of CHO supplementation to aid endurance performance. The authors wished to further this by examining the notion that even simply tasting a CHO solution might exert a positive influence on the brain and central nervous system, thus eliciting an improvement in performance. Using a randomized, double-blind crossover design, ten endurance-trained runners performed exercise within a controlled laboratory environment. Such fixed setting was to ensure all confounding variables were controlled. Each athlete undertook two 30-minute self-paced runs, prior to and during which they consumed ten bouts of either a 6 per cent CHO or taste-matched placebo mouth wash (i.e. the cause). Each consumption required the runner to rinse the mouth wash for five seconds and then expel the remainder. Throughout the running tasks a range of physiological and performance measurements were continuously monitored and recorded (i.e. the effect). The collection of numerical data allowed for a range of statistical assessments to be made on the data.

Correlational research

The purpose of this research strategy is to determine patterns of association between phenomena. In quite simple terms this relates to the mutual relation of two or more things. Numerically orientated, this deductive approach is of value to the researcher who wishes to identify the inter-relationships between measured variables. Sometimes referred to as descriptive research, because it describes existing relationships between variables, the correlational strategy attempts to describe the degree to which one or more quantifiable variables relate. Although the degree of agreement between these can be established, a causal link cannot be made. Only a level of association can be determined through the use of statistical techniques. Correlational research can lead to predictions being made based on the strength of the association and has been used to great success in estimating body fat (%).

The types of questions that can be answered using this strategy may include:

- Is there an association between social class and those who attend Badminton Horse trials?
- Is the number of 'aerobic' training miles completed in a year associated with sport-related injuries over the same time period?
- How does the long-term motivation of a sports team associate with the number of wins per session?
- Is there an association between lower limb bilateral strength deficits and the number of falls in elderly women?

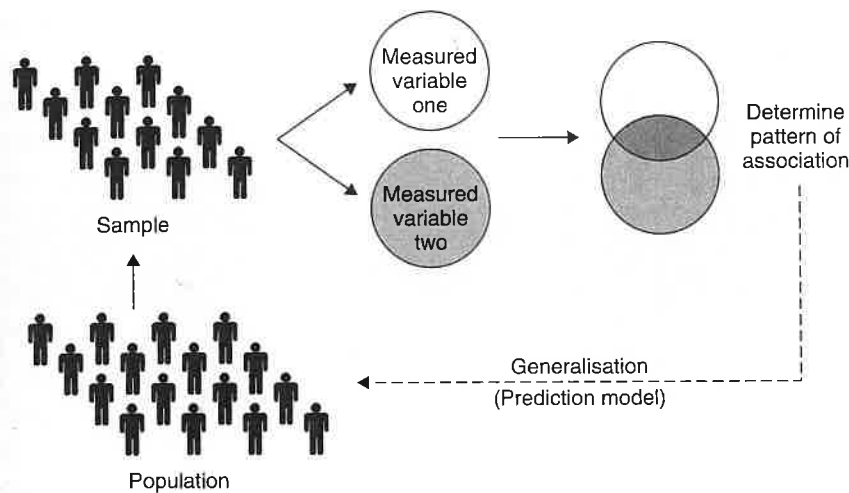


Figure 2.4: The correlational research strategy allows for association to be determined between two or more measured variables.

Research Focus 2.3

In a study by Vila et al. (*Journal of Human Sport and Exercise*, 2009, 4: 57–68) a correlational research strategy was selected to examine the association between anthropometric factors and throwing velocity of elite water polo players. The authors believed that such study would reveal the unique physical and physiological attributes needed to yield successful performance during this important sport-specific task. A total of 22 performers were selected within this cross-sectional design. The authors carried out a range of methods to collect the data. The evaluation of the anthropometric characteristics for each player was made in parameters considered important for the sport. These variables included mass, height, breadth measurements (i.e. wrist, femur, biacromial and humerus), % muscle mass, % body fat, BMI and somatotype. The authors also measured another variable; that being ball velocity. Each player, positioned in a pool 5m away from a target, threw the water polo ball which was recorded on high-speed video camera. With numerical data from each anthropometric variable and the data for ball velocity, the authors conducted statistical analysis to determine the extent to which each anthropometric variable related to ball velocity. The degree of association between the variables provided the authors with an insight into which anthropometric factors related more highly with throwing velocity.

Survey research

The purpose of this research strategy is to describe the characteristics of a population. Whether that be another group, organisation or community, the approach allows the researcher to find out how the population distribute themselves on one or more variables (ie. age, football team preference,

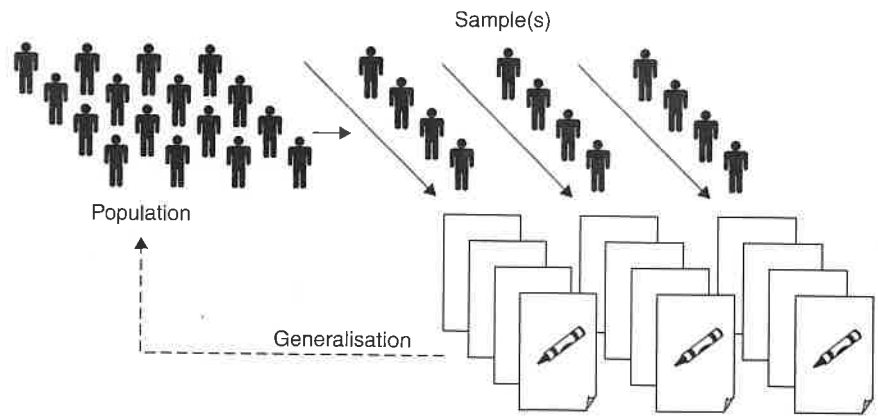


Figure 2.5: The survey research strategy allows for the collection of data from a large number of cases using methods such as questionnaires.

attitudes towards school PE, motives, etc). The researcher would generate numerical or non-numerical data from people by way of scores, outcomes, ratings, conditions or opinions through the use of data collection methods such as the questionnaire, interview or observation. The researcher can begin to describe and explain phenomena and attempt to make representations to the wider population. As with other research strategies the population is very rarely studied, instead a sample is surveyed and a description of the population is inferred from what is found out.

The types of questions that can be answered using this strategy may include:

- How effective are community-based well-being initiatives in improving social and emotional health among isolated rural dwellers?
- What is the importance of athlete-centred education to the aspiring elite athlete and how may it support performance development?
- What were the attendee's perceptions of a new 'Active Living' workshop series promoted by a Primary Care Trust?
- What strategies are fitness centre managers developing and implementing to combat the fall in membership numbers?

Research Focus 2.4

In a study by Brun et al. (*International Journal of Sport Nutrition and Exercise Metabolism*, 2009, 19: 97–109) a survey research strategy was performed to assess information regarding the past and present use of dietary supplements among 164 elite young athletes. A further objective was to identify the supplements used most frequently by the athletes and to assess motives and sources of recommendations, information, and products. In addition, the athletes were asked about their knowledge of the problem of contaminated supplements. Using a cross-sectional design, a total of

228 athletes who participated in an Elite Athlete monitoring programme between September 2006 and December 2007 were provided with a questionnaire regarding their use of dietary supplements. The questionnaires were sent to the athletes by mail with a return rate of 79 per cent. A closed-ended 5-page questionnaire was designed to assess the past and present use of dietary supplements, sport drinks and foods, and other ergogenic aids. In addition, athletes were provided space to list supplements that they could not classify. When necessary, these supplements were classified by experienced nutritionists during data analysis. In a separate question, athletes were specifically asked whether they had ever consumed supplements. Furthermore, information about motives, advice, supplement sources, and knowledge of supplement contamination was assessed using closed-ended questions. To answer these questions, athletes were allowed to choose multiple options.

Observational research

The purpose of this research strategy is to capture, through a range of observational techniques, social behaviour as accurately as possible. The ability of the researcher to effectively use their senses to systematically record observable phenomena or behaviour in a natural real-world setting, allows for the study of people in their native environment in order to understand things from their perspective. Through the systematic inquiry into the nature and qualities of observable individual and group behaviours we can learn what it means to physically and socially function within the world and/or interact with others to form social connections. Away from control and manipulation, the observational research strategy offers a gateway for the researcher to identify how social constructs and inter-relationships within and between people impact on social functioning.

The types of questions that can be answered using this strategy may include:

- What is the nature of the coach–junior athlete relationship in the presence and non-presence of parents?

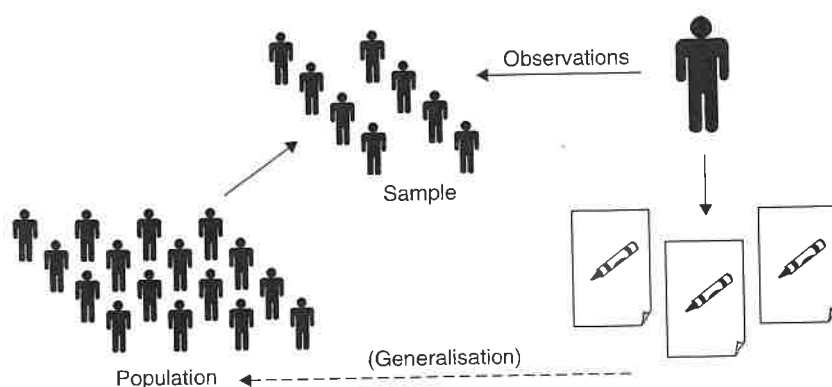


Figure 2.6: The observational research strategy provides a framework to observe behaviour to understand individual and group dynamics within a changing real-world setting.

- What are the movement dynamics of members within a newly built fitness centre and how may this influence placement of promotional material to different user groups?
- What are the actual, rather than reported, warm-up techniques of amateur golfers?
- What behavioural responses do school children exhibit when taught for the first time by a trainee sports coach?

Research Focus 2.5

In a study by Pate et al. (*Journal of School Health*, 2008, 78: 438–44) an observational research strategy was deployed to examine the physical activity levels of children attending preschools. The authors noted the fact that relatively little is known about the physical activity levels of children while they attend preschools or about how activity levels vary across preschools. As preschool-age children often are perceived to be highly physically active the authors wished to empirically examine this perception. For this study, preschools were divided into three categories based on preschool sponsorship and setting. This comparative design involved a total of 539 children across 24 preschools. An observational system for recording physical activity in preschool children was used to measure physical activity in the preschool setting. This recording system involved a '5-second observe interval' followed by a '25-second record interval' for each 30-second observation interval. The observational system assessed physical activity level and activity type (e.g., running, sitting, walking, and riding), social environment (e.g., initiator of activity, group composition), and non-social environment (i.e. child location and activity contexts). Data were collected in 30-minute sessions, and each child was observed for 10–12 sessions. The observation sessions were randomly chosen from the hours that each child attended preschool and were spread across ten days.

Case study research

The purpose of this research strategy is to portray, analyse and interpret the uniqueness of individual units – a person, a class, a family, an event, a situation, an organisation or even a product. Each case should have boundaries – an entity in itself. By capturing the complex contextual nature of the unit within a real-life setting, the researcher is able to present and represent an in-depth, detailed picture of one or more units or cases within their environment using a wide range of data sources. Bound tightly within the constructivist paradigm, the ability to make generalisations sits firmly with the recipient (i.e. the reader of the researcher). Because of the subjective, interpretivistic nature of case study research, generalising any findings should be viewed as approximating future expectations rather than establishing causality or making predictions.

The types of questions that can be answered using this strategy may include:

- What is the impact of a non-charter status football club on coaching provision across a wide age range?
- Does GolfMark improve junior development within a local privately owned club?

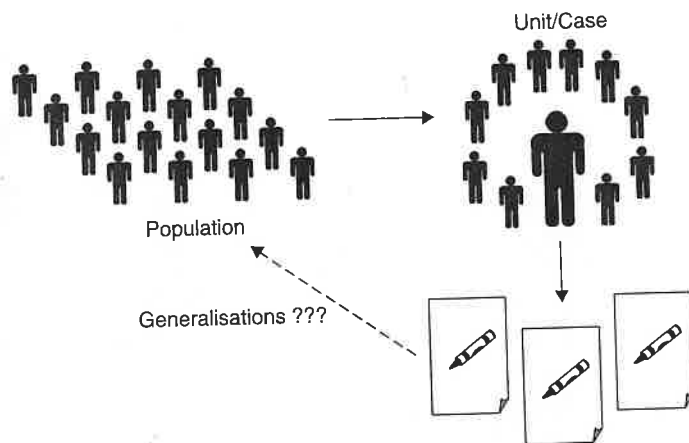


Figure 2.7: The case study research strategy involves collecting data, generally from only one or a small number of cases to provide insight into particular situations and/or experiences.

- What are the physical and mental preparatory strategies of a 'round-the-world' sailor?
- What educational benefit does 'sports day' have within secondary education?

Research Focus 2.6

In a study by Nieuwenhuys et al. (*Psychology of Sport and Exercise*, 2008, 9: 61–76) a case study research strategy was selected to describe the subjective experiences of an elite sailor during competition. It was hoped that such findings would be instrumental in better understanding the implementation of coping strategies during racing. By examining how an elite sailor describes their situational experiences and coping strategies during good and bad races, the authors hoped to develop a conceptual framework as a tool to further explore coping mechanisms in this demanding sport. The case in this study was a 23-year-old male who competed at an international level. Interviewed during two separate sessions, each lasting between 1.5 and 2 hours, the interviewer explored the sailor's performance-related experiences in two races that he had sailed in the past: one considered successful (interview one) and one not so successful (interview two). Each interview was semi-structured in nature and the 'narrative' account of the two races initially provided by the sailor formed the basis of each. Both interviews were recorded and transcriptions were checked for accuracy by the sailor and an independent researcher. Analysis of the data took place in order to identify a range of experiences and coping strategies mentioned by the interviewee.

Ethnographic research

The purpose of this research strategy is to understand and describe a group or culture, accepting that all human behaviour occurs within a context. The word literally means 'writing about people'

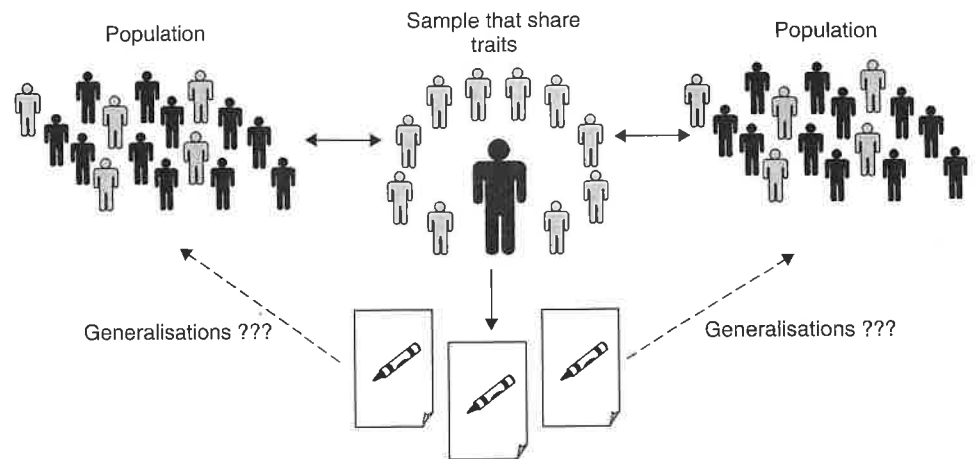


Figure 2.8: The ethnographic research strategy attempts to collect information from an insider's perspective and make sense of the data from an external social science perspective.

and broadly refers to the strategy of studying people for the purpose of describing their socio-cultural activities and patterns. This approach essentially involves descriptive research methods as a basis for interpretation. It represents a dynamic picture about the way of life of some interacting social group and, as a process, is a science of cultural description. Inductive in nature, ethnography differs from other similar approaches (i.e. case study research) in that it attempts to collect information from an insider's perspective and make sense of the data from an external social science perspective.

The ethnography can be written in different styles and formats, typically describing group histories, geography of location, kinship patterns, symbols and rituals, political positionings, educational and social systems, and the degree of contact between the investigated sub-culture and the main culture. Employing methods that range from the literature content analysis of books, newspapers, and electronic materials to individual interviews and observational strategies, the ethnographic approach attempts to gain a true insight from an insider's viewpoint and externalise it to social cultural dimensions.

The types of questions that can be answered using this strategy may include:

- What are the sporting experiences of Eastern European immigrants within inner-city locations?
- How has a change in gender acceptance impacted on women's experience of skateboarding?
- How may a community 'new-age' sports festival alter the perceptions of youth sport among elderly residents?
- Is social status a passport to private golf membership?

Research Focus 2.7

In a study by Atkinson (*Sociology of Sport Journal*, 2007, 24: 165–86) an ethnographic research strategy was selected to explore how a select group of men connected the consumption of sports supplements to the pursuit of 'established' masculinity. Data collection commenced through the researcher's personal involvement as a weight trainer in two local gyms: one, a private club with a closed membership, and the other, a pay-per-entry public gym. The study also built on the researcher's personal knowledge of, and experience with, sports supplements as a long-term (12-year) user and as an endurance athlete. By becoming closely acquainted to a legal supplement taker, the researcher formed connections to 57 men for this case designed study. By highlighting his own insider status as a user in order to encourage participation and deeper conversation, the researcher conducted active interviews to examine the social meaning of supplementation use. Tape recordings were made during every interview, and field notes were taken both during and after. Notes were then transcribed and conceptually analysed. Interviews ranged in length from 45 minutes to 3 hours. Most of the participants were interviewed once, with nine undertaking additional meetings.

What is a research design?

Research design is different from methods by which data are collected. Many research methods texts confuse research designs with methods. It is not uncommon to see research design treated as a model of data collection rather than a logical structure of the inquiry. But there is nothing intrinsic about any research design that requires a particular method of data collection.

(De Vaus, 2001, p 9)

Consider a tournament golfer for a moment. Before they step out onto the course for their round, they would have developed a plan to help them achieve the best score for that day. The player would have a detailed plan of the course layout, where the hazards are situated around each hole, the width of each fairway, the size and shape of each green, undulations and contours, and each flag placement. They would even have an awareness of the general weather conditions for the day. Their plan would also contain detail about how each hole needs to be played, considering where the ball needs to be positioned on the fairway following the tee shot and what parts of the green they want to avoid.

As players function in different ways it would be unlikely that the detail within each of their plans would be exactly the same. They will all show similar characteristics however. Some players, for example, may be naturally more aggressive than others, wishing to take more chances and accept the risks. These players expect unpredictable situations to occur on the course and see this as an inherent aspect of playing golf. Other golfers may be more reserved and calculated. Meticulous in their planning, they like to ensure that their performance is as predictable and replicable as possible, working out exact shots, club selection and distances. Neither of these two approaches is wrong and the plan selected suits the needs of each golfer. By developing a plan before they even go out on the

course, the golfers can have confidence that their approach will help optimise their chances of producing their best results.

Developing a design for our research requires the same care and attention as the golfer takes before each round. If the question is to be successfully answered then the design must be well considered before embarking on any data collection. *Research design* refers to the logical and systematic structure or plan by which data collection can take place. Bryman (2008) defines research design as a framework for the collection and analysis of data, supported by the definition of Fraenkel and Wallen (2003) who see the design being a plan for collecting data in order to answer the research question. The design is, therefore, the blueprint for the study, providing the researcher with an overall guide as to how the research methods will fit together and how, when and where the data collection tools and techniques will be implemented.

The design is inextricably linked to the research strategy selected, which is then directly linked back to the ontological and epistemological position held (Figure 2.1). Just as the golfer creates a plan based on their own philosophy to playing the game and their own objectives for the round, the researcher also develops their plan as to their beliefs and the objectives of the research. The plan selected, therefore, sits firmly within underpinning assumptions, governed by the wider ontological viewpoint, but more importantly by the objectives defined – in the case of the golfer, being “how can I achieve the lowest score?” As can be seen in Table 2.1, five research designs allow for a flexible working approach.

How do research methods differ?

Once the golfers have their plans, they can then go out on the course and start playing. Their shot selection will relate back to their original plan and, therefore, dependent on their overall *design* each shot will be different and require technique. The desired outcome for each means that the approach taken will produce slightly different end results and it is likely that these results will be slightly different each time performed. It is how the player is able to implement the skills of using their tools, that is to say their clubs, knowledge, experience and training they have available to them, that will dictate the quality of their play and ultimately the overall score achieved. If the wrong club is selected, technique implemented or decision made (i.e. going off plan), then the desired outcome, that is to say the objectives set at the beginning, will not be accomplished. Selecting a research method in essence is no different. There are many clubs (or methods) in our bag and selecting the right one(s) at the right time, and then being able to use our skill and experience to implement them will dictate the quality and value of the data collected.

It is not uncommon to see many research-related textbooks use research design and research methods interchangeably or confuse the two terms. Research design should be seen as the plan that guides us through the process of data collection, while the research method concerns the approach of how the data will actually be collected. Hitchcock and Hughes (1995) see *research methods* as techniques employed to gather data, consisting of either listening to others, observing what people do and say, or collecting and examining documents which human beings construct. Methods should be viewed as instruments and techniques of research that involve a technical, practical and ethical dimension. As can be seen in Table 2.2 research methods can be categorised into six areas. These

Research design	Description	Research strategy	
		Quantitative	Qualitative
Experimental	A research design that deliberately imposes a treatment on a case in the interest of observing the response. Within this design, a number of experimental conditions can be created (e.g. crossover design, repeated measures design, within-subjects design, between-subject design).	E.g. typically employs numerical data comparisons between an 'intervention/treatment' case with a control case and would require research methods that allow for the collection of objective numerical data.	Not typically employed within this paradigm.
Cross-sectional	A research design that involves collecting data on one or more cases at a single point in time. Collecting quantifiable data in connection with two or more variables allows for patterns of association to be determined.	E.g. can involve collection of numerical data from surveys, observational approaches or literature/content analysis on a case at a single point in time.	E.g. non-numerical data collected by interviews, focus groups, observation, etc., that relate to a single point in time.
Longitudinal	A research design where cases are assessed at several different time periods. Usually this design is used when interested in how people change over time.	E.g. survey research on a case on more than one occasion or literature/content analysis relating to different time periods.	E.g. mapping change over time through ethnographic research across periods, interviews on more than one occasion or through literature/content analysis.

*Table 2.1: Five research designs that create the plan within the research strategy (extracts from Bryman, 2008).
Continued overleaf*

Research design	Description	Research strategy	
		Quantitative	Qualitative
Comparative	A research design that involves studying more or less identical methods on two or more contrasting cases. Making comparisons implies the research can better understand social phenomena between cases/situations.	E.g. survey research where a direct numerical comparison is made between two or more cases, such as cross-cultural research.	E.g. making direct comparisons through ethnographic or qualitative interviews/observations on two or more cases/situations.
Case	A research design where a case is studied intensively. A case may be individuals, programmes, or any unit, depending on what is to be examined.	E.g. numerically oriented survey research on a single case with a view to revealing important features about its nature.	E.g. applying ethnographic, qualitative interviews, etc. to intensively study a case, being an individual, team or organisation.

Table 2.1: Continued

Research method	Description	Sport-related example
Clinical and non-clinical measurement	Any instrument, technique and/or procedure used within the natural sciences to make accurate objective numerical measurements of phenomena.	Collecting data by performing an incremental exercise protocol on a cycle ergometer to assess sub-maximal and maximal physiological responses.
Questionnaire	Any instrument consisting of a series of questions and other prompts, used for the purpose of gathering numerical and/or non-numerical data from respondents.	Collecting data by administering a series of linked questions to assess mood state during exercise (POMS).
Observation	Any technique, associated procedure and data recording instruments that allow for the systematic recording of observable behaviour of individuals or groups.	Watching and listening to how a coach interacts with a group of beginner swimmers during their first formal poolside lesson.
Literature/content analysis	Any technique and associated procedure that seeks to organise written, audio, and/or visual information into categories and themes related to the central questions of the study. This approach is especially useful in product analysis and document analysis.	Collating and analysing all newspaper, magazine, television and radio interviews conducted with members of the England cricket team over a one-year period.
Interview	Any technique and associated procedure that involves a conversation between two or more people (the interviewer and the interviewee) where questions are asked by the interviewer to obtain information from the interviewee.	Meeting with recreationally-inactive elderly ladies in order to assess their attitude to exercise.
Focus group	Any technique and associated procedure where a group of people are asked about their attitude towards something. Questions are asked in an interactive group setting where participants are free to talk with other group members.	Meeting and asking a group of exercise professionals about their views on the success of the GP Exercise Referral scheme.

Table 2.2: A broad range of methods are available to the sport researcher and are selected on the basis of what needs to be known from the world and people around us.

include clinical/non-clinical measurement, questionnaires, observations, literature/content analysis, interviews and focus groups.

Not being able to distinguish between design and method can lead to a poor research strategy and the inability to answer the research problem appropriately. Practically any design can be linked to any collection method, but this is dependent on the research question, so the art and science of research is to be aware as to the relative strengths and weaknesses of each selected method and link it to the most appropriate design. By bringing together an understanding of design and method, the selection of the overall research strategy will emerge.

Research strategy selection

So far in this chapter, research strategies, research designs and research methods have been explored. To consider your research approach as successful, the bringing together of all three of these aspects, underpinned by the associated assumptions linked to each position, must occur. By drawing on a research question already outlined earlier on in the chapter we will see how we can apply Figure 2.9 to help point us in the right direction.

Let us start with a research question already mentioned: "*What is the nature of the coach-junior athlete relationship in the presence and non-presence of parents?*" We can use this as an illustration to show how a suitable research strategy, with associated design and methods, can be selected. One of the first questions asked should really focus on what it is that needs to be known in order to answer the question. That is to say, what knowledge do we need to acquire? In this case, we want to know about *behaviours* exhibited through the relationship dynamics between the coach and junior athlete which may be verbal and/or non-verbal. We would want to identify whether these alter during the two situations: one being when parents are present and the other when they are absent from the coaching situation. Does the parents' presence influence the way the coach, athlete or both act and react to each other? It would seem appropriate (and probably necessary) to conduct this in as natural and real-world setting as possible so not to artificially influence in any way the interactions we are interested in observing.

By reviewing the seven research strategies and by referring to Figure 2.9, it would seem logical in the first instance to consider the experimental approach. This strategy would allow us to manipulate something (i.e. whether parents are present or not) and assess the effect (i.e. the way the coach and junior athlete behaves in each other's company). But as it would be important to set our research within a natural setting and doing this would make it incredibly difficult to control all other factors, establishing causality would be very problematic. By positioning the question within the positivist paradigm may also limit the '*type of knowledge*' we are able to gain when we get round to conducting the research project. We would be bound to collect quantitative data (i.e. numerically based) that, although would allow for some statistical analysis, may not enable us to find out about things that cannot be expressed through numbers, such as descriptions of body language, the meaning of hand and facial gestures and expressions or particular emphasis on words and phrases.

By looking at Figure 2.9, we can begin to recognise that some strategies may be better suited than others. By opting for a different approach we can begin to gain knowledge from the

participants that would allow us to paint a more detailed picture than others would permit. It may be deemed by some acceptable to approach this research question from an experimental perspective, particularly those who position themselves firmly in the objectivist camp. By applying another approach, however, such as the observational research strategy, we would re-position the research within the constructivist/interpretivist perspective, gaining qualitative rather than quantitative data. By opting for the observational research strategy, the researcher would be able to record, unobtrusively, behaviours exhibited by all (i.e. parents, coaches and athletes) in order to determine the social relationships, connections and influences that may exist among all observed. The selection of this approach would lead to a number of different research designs and methods that could be applied in order to build the research plan. This would lead to the selection of instruments, techniques and procedures to collect the data and then undertake data analysis.

So the question must drive the selection of the strategy and the strategy will provide a focus for the design and methods. Overcoming this hurdle in a research project opens up a gateway to effective data collection and project conclusions. The true value of the project can then be realised, enhancing not only the worth of the research to others, but also the researcher's own understanding as to the overall research process.

Learning Activity 2.1

Read the range of research questions below. Using the knowledge gained from Chapter 1 and 2, and by referring to Figure 2.9, allocate a research strategy (design and method(s)) to each. Remember more than one approach may be taken so write down all you feel could be used. Try and consider the strengths and weaknesses of each strategy and rank order them in preference if there are more than two.

- What are the emerging political developments relating to the sport-tourism link in Cumbria?
- What are the ground reaction forces on take-off for a group of high jumpers?
- Why is the introduction of self-administered training plans found on the internet seen as a threat by professional fitness trainers?
- What type of cycling pedal cadence is the most efficient?
- How do the perceptions of emotional climate among injured athletes impact on their personal and social interactions within a sporting team?
- Will the introduction of a new coach lead to higher performance levels throughout the team?
- What are the feelings of older adults (> 65yr) to the introduction of local physical activity road shows?

Research strategy	Ontological position	Epistemological position	Methodological position	Research design	Research method
Systematic literature review	Objectivist/constructivist	Positivist/interpretivist	Quantitative and/or qualitative	Cross-sectional or longitudinal	Literature/content analysis
Experimental	Objectivist	Positivist	Quantitative	Experimental (True, quasi-, or natural)	Can include one or more of the following: - Observation - Questionnaire - Clinical/non-clinical measurement
Correlational	Objectivist	Positivist	Quantitative	Cross-sectional	Can include one or more of the following: - Observation - Questionnaire - Clinical/non-clinical measurement
Survey	Objectivist/constructivist	Positivist/interpretivist	Quantitative and/or qualitative	Case, cross-sectional, comparative or longitudinal	Can include one or more of the following: - Observational surveys - Questionnaires - Focus groups - Interviews - Clinical/non-clinical measurement
Observational	Constructivist	Interpretivist	Qualitative (but may include aspects of the quantitative approach)	Case, cross-sectional, comparative or longitudinal	Observations
Case study	Constructivist	Interpretivist	Qualitative (but may include aspects of the quantitative approach)	Cross-sectional, comparative or longitudinal	Can include one or more of the following: - Observations - Questionnaires - Focus groups - Interviews - Content analysis
Ethnographic	Constructivist	Interpretivist	Qualitative (but may include aspects of the quantitative approach)	Case, cross-sectional, comparative or longitudinal	Can include one or more of the following: - Observation - Questionnaires - Focus groups - Interviews - Content analysis

Figure 2.9: The selection of a research strategy begins with the question or problem. Each strategy can be linked to a corresponding design and method.

Chapter Review

In this chapter we have considered the importance of research strategy and how each can be linked to different research questions. The choice of strategy and its associated research design(s) and method(s) provide the researcher with a foundation to their investigations. Being able to critically appraise the selected strategy, justifying why it is more suitable than others, and knowing its limitations will provide the researcher with an insight into the very nature of the knowledge, the process of collection and its overall generalisability and value. By using a range of sport-related research examples throughout this chapter you should now be able to:

- ☐ make the important distinction between a research strategy, a research design and a research method;
- ☐ explain the differences between the seven main research strategies and be able to list a range of sport-related questions that can be answered using each;
- ☐ list and describe the range of research designs and be able to link each design to an appropriate strategy;
- ☐ identify the different research methods that can be used to obtain data.

(Tick when completed)

Further Reading

Vaus de, D (2001) *Research Design in Social Research*. London: Sage Publications. Part One: pages 1–52.

This text offers a further commentary of the differences between design and method, offering the reader a range of illustrations to clarify the point. Easy to access, this additional text supports the chapter.

Burns, R B (2000) *Introduction to Research Methods*. London: Sage Publications. Part One: pages 1–25.

This opening chapter of a popular social science research methods text revisits the debate linked to contrasting perspectives in research. Although more aligned with Chapter 1 of this book, it is worth reviewing your knowledge on research strategy by reading this well-written selection.

Hitchcock, G and Hughes, D (1995) *Research and the Teacher*. 2nd edition. London: Routledge. Part One: pages 3–38 and 77–111.

With an educational bias, *Research and the Teacher* offers the reader a plain talking overview as to designing, planning and evaluating research. Covering the main aspects relating to research design selection, this text should be read by all those wishing to engage in sport research within an educational setting.

Research Methods in Sport

Mark F Smith



LearningMatters