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**Identifying a Research Question and Study Purpose(s)**

**Chapter Overview**

**The Research Topic**

* A narrowly focused aspect of research that represents clearly defined focal areas related to an important complex problem
* Identification of a research topic usually comes from the researcher’s interests, experiences, coursework, and academic background.

**The Research Problem**

* According to Creswell and Creswell (2018), the problem represents the foundational need for the study and describes the context for the study and the issues that exist in literature, theory, and/or practice.
* Effective problem statements answer the question “Why does this research need to be conducted?”
* The research problem should be:
  + Challenging
  + Worthwhile and important
  + Feasible (with respect to your time, expertise, and available resources)
* There are three types of research problems:
  + Descriptive research: Problems that are descriptive in nature include the need for describing a phenomenon, event, condition, or circumstance whereby no attempt is made to link information or explain outcomes.
    - For example, the need to describe levels of physical activity among adults
  + Predictive research: Problems are based on the premise that there is a need to identify relationships among variables, which are characteristics that may vary over time or across cases.
    - One might also be able to propose a direction of relationship such that certain variables predict an outcome.
    - For example, predicting a person’s risk for sustaining a sport injury by examining variables such as training, anxiety etc.
  + Explanation problems: Exist when researchers can make claims about cause and effect, or attempt to answer problems of why events and behaviours happen.
    - For example, experimentation around smoking and lung cancer

**Use of theory**

* Theory is an explanation of observed patterns or supposition about a relationship among phenomena.
  + Theories are usually derived from observations, experimentation, and reflective thinking and are composed of verifiable, testable statements or propositions (Mood & Morrow, 2015).
  + Theories often include relational statements that connect two or more variables such that knowing something about one variable can help to understand the other.

**Types of reasoning**

* The two types of reasoning in the scientific approach include:
* Inductive reasoning involves using observations of specific events and circumstances to make predictions about general principles that are tied together and united into theory.
* Deductive reasoning involves starting with concrete, generalized information often contained within a theory and use of this information to explain specific events or circumstances.

**The Literature Search and Review**

* The literature review is essentially a synopsis of what researchers know based on studies that have already been done on similar, relevant topics.
* The key is narrating the problem, use critical papers to justify the topic and identify complementary or juxtaposing perspectives.

**Sources for the literature review**

* Primary sources (the original research reported by the individual who proposed the work) are superior to secondary sources (by authors who are not the primary source that analyze, interpret, and reference the primary source).
* Main sources in a literature review include research articles, book chapters, meta-analyses, conceptual articles, and published reports.

**Reading research**

* Be familiar with the key publications in the field of interest.
* Pay attention to the discussion and explanations on the paper findings and its strength or weaknesses.

**Organizing the literature**

* The literature can be organized in many ways, but literature maps, and summary charts are particularly helpful.

**Writing the literature review**

* Once key articles are identified (approx. 20-40) using a literature map or summary chart, the writing process begins.
* The outline has three main parts:
* An introduction (a statement of the problem)
* The body (identifying what is known about the problem)
* The conclusion (a summary of the findings)

**Organizing and citing the literature**

* When discussing ideas and findings that are not your own you must properly cite (give credit to) the author(s) work.
* Citations can include:
* In-text citations
* Full bibliography
* When citing work there are many different styles for different academic disciplines and each type differs in style and rules. It is important to keep consistent style throughout a literature review.
* There are many software and online resources to help with this.

**Types of literature reviews**

* There are many types of literature reviews:
* Annotated bibliography
* Narrative review
* Scoping review
* Systematic review
* Meta-analysis
* Meta-synthesis

**Purpose**

* The purpose statement needs to be clear and concise, and ultimately states the intent of the study; it should also identify all the variables in the study.

**Study variables and phenomenon**

* There are several types of variables:
  + The independent variable is the variable that is manipulated (i.e., treatment variable).
  + The dependent variable is the variable that is being affected and represents the outcome being assessed as a result of the independent variable(s).
  + A moderator variable is a variable of interest that cannot be manipulated and is studied specifically to examine whether the presence of this variable changes the relationship of the independent and dependent variable.
  + A control variable is one that can influence the outcome or results of the study; they are measured variables but not the main focus of the study.
  + A mediator variable is one that is proposed to (at least partially) explain the relationship between and independent and dependent variable.
  + Extraneous variables are unmeasured variables which are not controlled for in the study.
* A central phenomenon is the main focus in qualitative research and is a focal area that the researcher tries to better understand.
* The research purpose statement varies depending if the research is quantitative, qualitative, or mixed methods in nature.

**The Research Questions and Hypothesis**

* A hypothesis is a prediction that is derived from theory, literature, or speculation about the outcome of a study.
  + A research hypothesis (or alternative hypothesis) can be a statement about what treatment group might have higher scores, or statements about the strength or the direction of a relationship.
  + The null hypothesis states that the independent and dependent variables are not related, or that there are no significant differences between groups.
* A research question is a broad inquiry statement about the central phenomenon.

**Learning Objectives**

By the end of this chapter, students should be able to:

* Describe the process of identifying research topic;
* Identify strategies to narrow your interests to a specific research question and purpose for your study; and
* Discuss *why* literature is used and *how* it is used in research.

**Suggested Class Activities**

**Activity #1**

**Teaching Objective**: Have students be able to identify various components of a research project.

**Procedure**: Show the video linked below on the projector screen in class. Before starting the video, ask the students to take note of and write down the research problem, research question, purpose, hypothesis, independent variable(s), and dependent variable(s). Discuss their answers. Ask students how the research problem could have been studied qualitatively.

* Potential Video Reference: <https://vimeo.com/124934021>

**Activity #2**

**Teaching Objective**: To help students understand how to formulate a purpose statement using different types of designs and understand the key differences

**Procedure**: Review strategies for writing a quantitative purpose statement (see “Quantitative purpose statement”), a qualitative purpose statement (see “Qualitative purpose statement”), and a mixed-methods purpose statement (see “Mixed methods research purpose statement”) by displaying the strategies as slides within the lecture. Split the class into four groups, and introduce the topic of parent harassment (i.e., conduct or comments by parents towards a coach, referee, or player, that create a hostile environment for sport activities and may negatively affect performance) in sport.

The groups would be divided as follows: 1) quantitative design; 2) qualitative design; 3) concurrent mixed methods; 4) sequential mixed methods. Instruct students to pick any aspect of parental harassment in sport and create and write down a purpose statement using the type of design they were assigned. Following this, have the students get into groups of four (with one individual from each of the previous four groups) and share their statements. After the students share their purpose statements, wrap up the activity by leading a discussion about the key features and differences about a purpose statement with each of these designs. Also ask students if they’d like to share their thoughts and experiences with the class on this topic.

* Potential References:
* <http://respectinsport.com/parent-program/>
* <http://www.iihf.com/fileadmin/user_upload/PDF/Sport/Coaching_manuals/8_Level_I_Harrassment_and_Abuse.pdf>

**Activity #3**

**Teaching Objective**: Have students be able to directly and succinctly communicate their research topic and gain experience in public speaking.

**Procedure**: Before the lecture, post an announcement/send an email to students asking them to think of a research topic of interest to them and to think about how they would go about conducting research on that topic. Let them know they will need this information for an in-class activity at the following lecture.

During the class, introduce the activity to the students. Let them know they are to provide an “elevator pitch” (a 1-minute summary) of their research topic to a classmate. Have students pair up and deliver their “elevator pitches” to each other, ensuring that their research topic, research design, and purpose statement are conveyed. To wrap up, have students come together as a class and facilitate a discussion about the issues they may have had, or lessons learned with this activity.

**In-Class Discussion Questions**

* How is theory used in quantitative vs. qualitative research? (see “Use of theory”)
* How might the use of theory differ depending on worldview and/or research approach?
* What are the differences between key variables (quantitative) and central phenomena (qualitative)? (see “The study variables and phenomena”)
* What is the difference between moderator and mediator variables? What are some common mediator and moderator variables in sport and exercise-related research? (see “The study variables and phenomena”)

**Additional Resources/Websites/Video links**

* Picking your topic is research (North Carolina State University)
  + https://www.youtube.com/watch?v=Q0B3Gjlu-1o
* Completing a Literature review (East Carolina University)
  + https://www.youtube.com/watch?time\_continue=13&v=i1KzcbYMdzk
* Tips on conducting a Literature Review (University of Toronto)
  + http://advice.writing.utoronto.ca/types-of-writing/literature-review/
* Literature reviews in the health sciences (University of Saskatoon)
  + https://libguides.usask.ca/reviews
* Literature Searching (CAMH)
  + https://guides.hsict.library.utoronto.ca/CAMH/LiteratureSearching\_GoodPractice
* Annotated Bibliography (Cornell University Library)
  + http://guides.library.cornell.edu/annotatedbibliography
* Organizing your Social Sciences Research Paper (University of Southern California)
  + Includes further links on the research process - from choosing a research question to finishing a paper
  + http://libguides.usc.edu/writingguide/purpose
* Writing in Kinesiology
  + Baghurst, T., & DeFreitas, J. (2017). *Writing and Publishing Research in Kinesiology, Health, and Sport Science*. Taylor & Francis.
* Choosing Between a Systematic or Scoping Review
  + Munn, Z., Peters, M.D.J., Stern, C. *et al.* Systematic review or scoping review? Guidance for authors when choosing between a systematic or scoping review approach. *BMC Med Res Methodol* 18,143 (2018). <https://doi.org/10.1186/s12874-018-0611-x>

**Essay/Long-Answer Exam Questions**

1. Differentiate between inductive and deductive reasoning. Provide examples within the realm of sport and exercise research.

2. Define and give an example relevant to kinesiology for the following:

1. Moderator variable
2. Control variable
3. Mediator variable
4. Extraneous variables

3. Choose a topic of interest to you within the sport and exercise field and compose a quantitative research purpose statement related to that topic. Be sure to include variables, a theoretical framework or model, participants, and the strategy of inquiry.

4. Choose a topic of interest to you and compose a qualitative research purpose statement related to that topic. Be sure to include the central phenomenon, philosophical worldview and research approach, participants, strategy of inquiry, and location of where research is being conducted.

5. Below are two abstracts looking at similar topics in different ways. Read over the abstracts and then answer the following:

* Identify which abstract is quantitative and which is qualitative.
* Identify the central phenomenon in the qualitative abstract.
* Identify the independent and dependent variables in the quantitative abstract.
* Explain how a mixed-methods design could be used to assess this topic.

**Abstract #1** (Brophy et. al., 2011)

**Background**: To understand the key challenges and explore recommendations from teenagers to promote physical activity with a focus on ethnic minority children.

**Methods**: Focus groups with teenagers aged 16-18 of Bangladeshi, Somali, or Welsh descent attending a participating school in South Wales, UK. There were seventy-four participants (18 Somali, 24 Bangladeshi, and 32 Welsh children) divided into 12 focus groups.

**Results**: The boys were more positive about the benefits of exercise than the girls and felt there were not enough facilities or enough opportunity for unsupervised activity. The girls felt there was a lack of support to exercise from their family. All the children felt that attitudes to activity for teenagers needed to change, so that there was more family and community support for girls to be active and for boys to have freedom to do activities they wanted without formal supervision. It was felt that older children from all ethnic backgrounds should be involved more in delivering activities and schools need to provide more frequent and a wider range of activities.

**Conclusions**: This study takes a child-focused approach to explore how interventions should be designed to promote physical activity in youth. Interventions need to improve access to facilities but also counteract attitudes that teenagers should be studying or working and not 'hanging about' playing with friends. Thus, the value of activity for teenagers needs to be promoted not just among the teenagers but with their teachers, parents, and members of the community.

**Abstract #2** (Galvez et. al., 2013)

**Objective**: The role of neighbourhood physical activity resources on childhood physical activity level is increasingly examined in pediatric obesity research. We describe how availability of physical activity resources varies by individual and block characteristics and then examine its associations with physical activity levels of Latino and black children in East Harlem, New York City.

**Methods**: Physical activity resource availability by individual and block characteristics was assessed in 324 children. Availability was measured against 4 physical activity measures: average weekly hours of outdoor unscheduled physical activity, average weekly metabolic hours of scheduled physical activity, daily hours of sedentary behaviour, and daily steps.

**Results**: Physical activity resource availability differed by race/ethnicity, caregiver education, and income. Presence of one or more playgrounds on a child's block was positively associated with outdoor unscheduled physical activity (odds ratio [OR] = 1.95, 95% confidence interval [CI] 1.11–3.43). Presence of an after-school program on a child's block was associated with increased hours of scheduled physical activity (OR = 3.25, 95% CI 1.41–7.50) and decreased sedentary behaviour (OR = 3.24, 95% CI 1.30–8.07). The more resources a child had available, the greater the level of outdoor unscheduled physical activity (*P* for linear trend = .026).

**Conclusions**: Neighbourhood physical activity resource availability differs by demographic factors, potentially placing certain groups at risk of low physical activity level. Availability of select physical activity resources was associated with reported physical activity levels of East Harlem children but not with objective measures of physical activity.

6. Differentiate between a concurrent mixed-methods design and a sequential mixed-methods design.

* Identify when you would use a concurrent design; identify when you would use a sequential design.
* Choose one (concurrent vs. sequential) and create a purpose statement exploring the relationship between body image and sport dropout among adolescent girls.

7. Imagine you are a researcher looking at the association between concussions and helmet usage among children in Ontario.

* Which variable is the independent variable? Which is the dependent variable?
* Provide one alternative hypothesis and one null hypothesis (one sentence each) that might explain the relationship between these two variables.

8. Imagine you are a qualitative researcher interested in physical activity levels of Canadian children living in poverty.

* Identify a qualitative central research question.
* Identify three sub-questions.

9. In the context of sport and exercise research, define and provide an example of each of the following:

* Descriptive research
* Predictive research
* Explanation problems

10. Read over the statement below describing a hypothetical study and identify the types of variables that are used.

A researcher is examining the effect of running on knee injuries. Specifically, she is interested in the relationship between running distance and incidence of knee injuries. She is also interested in whether sex, age, and socioeconomic status play a role in this relationship. When analyzing her results, she also finds that the type of shoe and the type of music the runners listen to also have an impact on the relationship between running and knee injuries.

**Case Studies**

**Case Study #1**

Marius is a high school student playing basketball at an elite level. He is convinced that whether or not someone makes it into the NBA is solely dependent on hours of practice. As such, he is spending all of his free time practicing while neglecting other important aspects of his life, like social relationships and school. His friend Julia, who is concerned about these other aspects of his life, wants to look into other factors that might influence whether or not someone makes it into the NBA.

**Discussion Questions**:

* In Marius’s view, what are the dependent and independent variables in this situation?
* What are some moderating, mediating, or extraneous variables that Julia might consider in this relationship?
* Is this situation an example of where descriptive or predictive research might be used? Justify your reasoning.

**Case Study #2**

Imagine you are reading a very interesting article on physical activity and IQ. You want to know if participating in high intensity interval training (HIIT) 5 times a week can increase a person’s IQ. Your friend Carlos read the same article and wants to know if University athletes perceive themselves as smarter than non-athletes.

Discussion Questions:

* What type of research study are you describing? Is this different or the same as your friend Carlos?
* If you wanted to know more information on *your* research topic, what type of literature review could you use?
* What is an example of a research purpose statement for *your* topic of interest? Identify the dependent and independent variables.
* What would *your* null hypothesis be?