

# Preface

## New to the Second Edition

You will find several important changes in this edition that were based on user feedback and the careful review of the first edition by anonymous external reviewers. Taken together, these changes aim to make the book more focused, applicable, and practical to developing critical consumers of up-to-date research across disciplinary topic areas. The key changes include the following:

- **Enhanced focus on reading research.** This edition has more clearly placed the focus on reading research in all aspects of the book's content, from the introduction to each chapter's topic to how consumers can evaluate research reports. This focus helps students through the process of reading, understanding, and evaluating the key elements of research articles.
- **Advanced considerations for evaluating research.** This edition has significantly expanded its treatment of how students can learn to evaluate the research studies that they read. To facilitate this development, Chapters 3–14 include tables that introduce criteria useful for evaluating research articles and provide indicators of higher and lower quality for each of the criteria. Each chapter also includes a rating scale form that students can use to apply the criteria to study reports.
- **New full-text articles that apply the book's content.** This edition includes a total of eight new full-text articles to assist students with applying the content they are learning. The articles represent current research on diverse topics and using diverse research approaches. They are “typical” examples of the kinds of articles that students might read, meaning that they demonstrate the limitations and messiness often found in published reports of real research studies. Two of the articles include annotations to help students locate key ideas, but students are expected to provide their own annotations for the remaining articles to better develop their skills for reading research.
- **More coverage of higher-level research approaches.** Additional information has been included to provide students with resources to understand the more sophisticated methods found in published research. Examples of this additional information are tables that summarize a wider array of common quantitative and qualitative research designs (Chapters 6 and 9), the inclusion of more higher-level statistical approaches in summary tables (Chapter 8), and more consideration to the kind of claims that can be made at the conclusion of different types of research studies throughout this edition.
- **Inclusion of more examples that are up-to-date and represent diverse disciplines.** More examples from published studies have been included throughout this edition. Furthermore, the references have been extensively updated to include more current examples of published research and expanded to better represent a variety of content areas in addition to education.
- **Improved pedagogical features in the presentation of the content.** Steps have been taken to better align the pedagogical features in this edition. For example, each chapter's learning objectives focus on what the students will be able to do as critical consumers of research and are aligned with the major headings throughout the chapter. In addition, each chapter concludes with a *Reviewing What You've Learned To Do* feature that helps students to synthesize the content addressed for each specific learning objective.
- **Additional activities to practice and apply the chapter content.** The number of activities embedded within the chapters has been increased to give students more

opportunities to engage with the content and check their own understanding as they read. End-of-chapter exercises have also been expanded to include *Reading Research Articles* activities that ask students to identify features within published articles, *Understanding Research Articles* activities that ask students to apply concepts and vocabulary introduced in the chapter, and *Evaluating Research Articles* activities that ask students to critically assess published articles using the chapter content.

- **Additional scaffolding for use of the APA Style.** All information about the American Psychological Association (APA) style has been updated to the 6th edition manual (APA, 2010) in this edition. Information about recording references for different types of publications has been included in Chapter 1 and more information about the use of references and headings is included in Chapter 4. In addition, a paper that illustrates the major elements of the APA style has been included as an Appendix to provide students with a concrete example of how the style elements can look when applied in their own writing.
- **New embedded etext features to enhance students' engagement.** The etext version of the book includes several new features embedded into the chapters that facilitate students active engagement with the chapter's content. The *Reviewing What You've Learned To Do* pop-up feature provides students with 10–15 questions similar to the text bank questions and instant feedback to help them self-assess their comprehension of the chapter content. The *Reading Research Articles* activities ask students to create APA-style references for the assigned articles and provide them with feedback. In addition, they are asked to locate and annotate statements within the articles that demonstrate the chapter's content. The *Understanding Research Articles* activities ask students to complete short-answer questions about the articles and provide them with the corresponding answers to check their understanding. The *Evaluating Research Articles* activities ask students to complete their own assessment of the quality of research studies using the provided rating scales and include a small number of hints to help work through these challenging considerations.

## Philosophy and Purpose for this Book

Welcome to *Understanding Research: A Consumer's Guide*! This title captures the four perspectives that guided the development of this book.

First, this is a book about **research**. We view research as a process of interconnected activities that individuals use to gain new knowledge that addresses important concerns or issues in fields such as education, social work, counseling, nutrition, and nursing. Individuals practicing research follow a general set of steps from the initial identification of a research problem to ultimately disseminating their conclusions, and knowing about the research process provides a useful framework for understanding and evaluating the information that researchers include in the reports of their studies. We also recognize that researchers today have a large toolbox of approaches for conducting their studies, including quantitative, qualitative, mixed methods, and action research. Each of these approaches is legitimate and appropriate for addressing certain types of research situations, and researchers are making extensive use of the different approaches across all major disciplines. Therefore, this book examines the application of diverse research tools to meet the needs of today's students who should become familiar with all the prominent approaches used to develop new knowledge through research studies.

Second, this book is written specifically for **consumers**. Consumers use research in their jobs. Consumers include anyone who uses the results and implications of research studies to enhance their knowledge and improve their practice. Practitioners such as teachers, school administrators, counselors, social workers, nurses, dietitians, and therapists can all benefit from becoming critical consumers of research. To effectively use the results of research, consumers need to know how to read, understand, and evaluate the quality of research. This book's content and approach have been conceptualized specifically to meet the needs of this important consumer audience.

Third, fitting the needs of a consumer audience, the focus of this book is on **understanding** research; it is not about how to conduct research. Specifically, this book addresses the skills, knowledge, and strategies needed to read and interpret research

reports and to evaluate the quality of such reports. This focus is reflected in the overarching organization of the content, which is based on the major sections of a research article. After an introduction to research in Part I, Parts II–VI present chapters related to understanding the Introduction, Method, Results, and Conclusion sections of research articles that report studies using the different research approaches.

Finally, this book has been written as a *guide* that offers readers practical advice and strategies for learning to understand research reports. Throughout this book, we relate the process of research to the process of taking a journey. When travelers take journeys, they use travel guides to navigate new places, to identify special attractions and sights, and to develop an appreciation for local customs. Likewise, this guide to understanding research aims to help consumers navigate the major sections and content of research reports by identifying key elements when reading each section and developing an appreciation for how different types of research are conducted and ultimately reported.

Keep in mind that this is not an advanced text, and it does not discuss all of the approaches to research that are available. In addition, this book does not provide an exhaustive treatment of the research process, as it does not present details that are necessary for research producers, such as how to conduct statistical calculations. This is an introductory book focused on helping students who plan to be research consumers learn to read, understand, and evaluate research reports so they can better apply the results of research to their knowledge base and professional practices.

## Key Features

This book is a comprehensive introduction to help students learn how to understand research articles. In developing the content and writing style, we have attempted to consider the concerns and experiences of a consumer audience by developing a book that is engaging to read, includes up-to-date content, and has a strong applied focus. The following key features highlight the approach of this book:

- It focuses on helping students learn to read and evaluate research articles.
- It provides a balanced coverage of diverse approaches to research: quantitative, qualitative, and combined approaches.
- It includes extensive examples and practice activities to engage students with the content.

Let's examine these in detail to see how each can help instructors and students achieve their course objectives.

## Helps Students Learn to Read and Evaluate Research Articles

This book emphasizes helping students become competent and critical readers of research articles. To this end, we offer guides throughout the text for reading and evaluating research articles. The book also provides many features to further help students become more skilled at interpreting and evaluating research reports, including what follows:

- The organization is built around the major sections one typically finds when reading research articles and reports: Introduction, Method, Results, and Conclusions.
- Each chapter begins with a section that discusses how to locate and identify the chapter's focus when reading a research article.
- Eight full-text research articles are included. The first two articles are annotated to help readers recognize the characteristics of the different research approaches. For the remaining six articles, students are prompted to read for and identify key elements of the research report that apply the content covered in the chapters to further develop their own skills for interpreting the information presented in research articles. The articles also serve as the context for applying each chapter's content in the *Reading Research Articles* and *Understanding Research Articles* exercises found at the end of each chapter.

- The *Here's a Tip!* feature offers practical advice for applying the chapter concepts when students read actual studies.
- Criteria for evaluating published studies, including indicators of higher and lower quality, are provided. In addition, the chapters include a rating scale that students can use to apply the stated criteria to evaluate a study of their choice or as assigned by the instructor. The *Evaluating Research Articles* exercises found at the end of the chapters ask students to apply the rating scales to articles included in the book.

## Balances Coverage of Diverse Approaches to Research

This book provides balanced coverage of all types of research design. This provides readers with a complete picture of educational, social science, and health science research, as it is currently practiced. The book begins with an overview of the process of research and then guides the reader through understanding how this process is presented within the major sections of a research report. The content describes and compares four major approaches to research: quantitative, qualitative, mixed methods, and action research. Keeping with the balanced coverage, the full-text articles represent three quantitative, three qualitative, one mixed methods, and one action research study.

The book also encourages readers to go beyond the general approach to recognizing and evaluating specific designs commonly used to implement each of the major approaches. The research designs are introduced as important considerations for understanding the methods and results of research reports. The highlighted research designs include:

- experimental (i.e., true experiments, quasi-experiments, and single-subject research) and nonexperimental (i.e., correlational and survey) quantitative research designs;
- narrative, grounded theory, case study, and ethnographic qualitative research designs;
- convergent parallel, sequential explanatory, sequential exploratory, and embedded mixed methods research designs; and
- practical and participatory action research designs.

## Includes Extensive Examples and Practice Activities to Engage Students with the Content

Learning to understand research reports is not easy. For most students, research reports represent new vocabulary, new concepts, and new ways of thinking critically about unfamiliar information. This book incorporates many features to help students engage directly with the content so that they can better develop their understanding and skills. Examples of these features include what follows:

- Consumer-focused learning objectives that indicate concrete goals for what students will be able to do after learning the chapter content. *Reviewing What You've Learned To Do* summaries and text quizzes at the end of the chapters help students review and self-assess their mastery of the learning objectives.
- Topics that are focused on the needs of consumers new to learning about research, such as how to identify examples of research in the literature and why reading research is relevant for practitioners.
- Practical examples from students' own real-world experiences to help explain research concepts.
- Extensive in-text examples from recently published research articles to illustrate the topics discussed. Note that citations included within example excerpts are not included in the book's reference list.
- Key terms are boldface within the text and defined in the glossary to provide easy reference.

- *What Do You Think?* exercises with *Check Your Understanding* feedback help students engage with the new content as they are reading.
- *Here's a Tip!* notes that offer students advice for applying chapter content to their own situations.
- *Reading, Understanding, and Evaluating Research Articles* application activities, short-answer questions, and evaluation activities help students apply chapter content to published research reports. Suggested answers for the short-answer questions help students assess their own progress in understanding the content, while application and evaluation activities provide opportunities to meaningfully apply the content.

## SUPPLEMENTARY MATERIALS

### Online Instructor's Manual with Test Bank

This supplement developed by Dr. Michelle Howell Smith provides instructors with opportunities to support, enrich, expand upon, and assess chapter material. For each chapter in the book, this manual provides lecture notes that summarize important concepts requiring review and reinforcement, strategies for teaching chapter content, and suggestions for when and how to use the supplements with the text. The test bank contains various types of items—multiple-choice, matching, short essay, and fill-in-the-blank—for each chapter. Questions ask students to identify and describe research processes and design characteristics they have learned about and to classify and evaluate quantitative, qualitative, and combined study reports.

### Online PowerPoint® Slides

PowerPoint slides are available to instructors for download on [www.pearsonhighered.com/educator](http://www.pearsonhighered.com/educator). These slides include key concept summarizations and other graphic aids to help students understand, organize, and remember core concepts and ideas.

### TestGen

This computerized test bank software allows instructors to create and customize exams. TestGen is available in both Macintosh and PC/Windows versions.

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## AN INTRODUCTION TO UNDERSTANDING RESEARCH

Discussions of research are all around you in your day-to-day life. You see research reported in the local news, hear about recent findings from your physician, and may even consider it when deciding which new cell phone to buy. You may even have participated in research by responding to a survey conducted over the phone about an upcoming election or answering questions about your opinions of a new product at a store. Research also plays an important role for us as professionals. Whatever our professional area is, research is often used to justify new policies and form the basis for new materials and practice guidelines.

The importance of research in our personal and professional lives is clear, but learning to understand research is not always easy. Researchers have developed a specialized process and language for conducting and reporting their studies, and you need to learn how to interpret the relevant steps and vocabulary as you read research reports. By developing your skills for understanding research, you will open up resources and knowledge that can help you become better informed about topics important to you personally and professionally. By understanding research, you will also become a critical consumer of research who is better able to evaluate the basis of new information reported from research studies.

Your first step to becoming a critical consumer of research is to develop a big picture of what research is to help you decipher the information included in research reports. Let's consider an analogy to help us think about how researchers conduct and report their research studies. When a researcher conducts a study and writes up a report, it is a lot like a traveler taking a journey to a destination and putting together a scrapbook of the trip. Travelers use road maps to find their way along unfamiliar territory and researchers use the process of research to guide their research "journeys." In Chapter 1, you will be introduced to the steps in the process of research that researchers use to plan and conduct the activities in their research studies. Knowing about this process will provide you with a general research "road map" for navigating the information you read in research reports. Travelers also take different types of journeys to reach their destinations—some use specific routes planned from the start and others allow the routes to unfold as they go in order to explore unexpected places along the way. Likewise, researchers conduct different types of studies to cover the "terrain" of interest. In Chapter 2, we will focus on two major types of research—quantitative and qualitative—that researchers use when conducting different studies. We will consider how to understand research articles that report these different types of research "journeys" using the same general "map" of the research process.

Let's get started on your own journey to becoming a critical consumer of research!

# THE PROCESS OF RESEARCH: LEARNING HOW RESEARCH IS CONDUCTED AND REPORTED

*The goal of this book is to help you learn how to read and make sense of research reports. To understand research reports, however, you first need to know a little about what research is and how researchers conduct and report it. By learning how research is done, you can better recognize and evaluate the information that researchers include in their reports. This chapter begins by first considering the question: What is research? Armed with a definition, you will next consider reasons for reading research studies and where you can find research studies reported. In this chapter, you will also learn the steps researchers use to conduct studies and how you find these steps discussed within the major sections of research reports.*

## **BY THE END OF THIS CHAPTER, YOU SHOULD BE ABLE TO:**

- State a definition of research and use it to recognize reports of research studies.
- Identify your reasons for needing to read research reports.
- Name different formats where you can find reports of research studies.
- Name the steps in the process of research that researchers undertake when they conduct research studies.
- Identify the major sections of a research report, and know which steps of the research process are reported within each section.
- Read a research report and recognize the information included about a study's research process.

Let's begin by taking a moment to welcome you to this endeavor of learning to read and understand research reports. Whether you are a student just starting your career or an experienced professional enhancing your knowledge, we hope you will find learning about research a rewarding experience. Whatever your profession—teacher, principal, counselor, social worker, child care provider, nurse, nutritionist, or other practitioner—reading research studies can provide you with information useful for your practice. For example, perhaps you work with children in a community of professionals that is concerned about the children getting enough physical activity to maintain healthy weights and support appropriate development. Some personnel think that a new program should be started to encourage physical activity within the schools to help children be more active. Other personnel are not convinced that such a program would be the best use of resources. In addition, no one knows what types of programs are possible, what benefits the programs can have, or which type will work best within the community.

This example is a perfect illustration of how you could benefit from reading research on an important issue such as physical activity in schools. Although you may have personal experience with this issue, you may not be familiar with how to identify and read reports of research. However, reading research on the issues that matter to you can provide you with new ideas and insights that can make a difference in your practice. Developing your skills for reading and understanding research reports starts by obtaining a good understanding of what research is and why you should want to read it. Therefore, let's start by considering how you identify research, why you should read research, and where you might find research reports.

## How Do You Identify Reports of Research?

Before going any further, we need to answer the question: What is research? Simply stated, **research** is a process of steps used to collect and analyze information in order to increase our knowledge about a topic or issue. At a general level, this process of research consists of three steps:

1. Posing a question.
2. Collecting data about the question.
3. Analyzing the data to answer the question.

These steps should be a familiar process as we all have engaged in informal research many times. Toddlers use this process when they wonder how their parents will react if they knock a bowl of spaghetti on to the floor (and then try it!). Students use it when engaging in inquiry-based learning activities in science class. Sports fans use it when they gather information to decide which players to include on their fantasy teams. And you likely use it regularly when solving problems at home or at work when you start with a question, collect some information, and then form an answer. Engaging in *informal* research gives you a useful process for learning about and solving problems that you face. It also provides you with experiences that will be helpful for understanding formal research. In *formal* research, researchers have developed a more rigorous approach to the research process for studying topics than what we all use in our daily lives for solving problems. It is this more *formal* process of research that is the focus of this book.

### Recognize That Formal Research Includes the Collection and Analysis of Data

When researchers conduct formal research studies, they include a few more steps in the research process than the three listed above. For example, researchers actually complete multiple steps when “posing the question” of interest in a research study. We will learn much more about these steps later in this chapter and throughout this book. For now, the key idea for identifying research is that researchers use a process of research to *collect and analyze data* in order to increase our knowledge about a topic or issue. The collection and analysis of data is what differentiates research from all other types of activities. Data are pieces of information (numbers, words, facts, attitudes, actions, and so on) that researchers systematically gather from entities, such as individuals, families, organizations, or communities. Researchers analyze or make sense of this data in some way to produce results that answer their question. Therefore, the defining feature of research is that researchers go out and gather data to answer their question as opposed to answering it based on their own opinions, experience, logic, hunches, or creativity.

When you are reading a document such as an article on a topic that interests you, you can use the definition of research to determine whether it is describing a research study. Examine the checklist for identifying a document as an example of *research* provided in Figure 1.1. We use this rating scale whenever confronted with a new article about a topic of interest. First, we examine the article’s title for clues as to whether it reports a research study. Words such as *research*, *study*, *empirical*, *investigation*, or *inquiry* are often good clues. Next we turn to the abstract to look for evidence that the author collected and analyzed data. An **abstract** is a brief summary of an article’s content written by the article’s author and placed at the beginning of the article. Because abstracts are so short (often 150 words or less), authors may not include good details about their studies in them. If the abstract does not satisfy the checklist in Figure 1.1, then we examine the full text of the article to see whether the author reports the collection and analysis of data. Using this rating scale will help you distinguish reports of completed research studies from other types of scholarly writing.

### Distinguish Reports of Research From Other Types of Scholarly Writing

A common pitfall for those new to research is to assume that all scholarly writings that they read represent research studies. In fact, there are *many* different types of scholarly writing about different topics that are published and available. Table 1.1 lists several

**FIGURE 1.1**  
**A Rating Scale**  
**for Determining**  
**Whether an**  
**Article Reports**  
**a Research**  
**Study**

- Examine the article's title, abstract, and Method section.
- For each criteria in the following rating scale, assign a rating of no (0) or yes (1) and record your evidence and/or reasoning behind the rating.
- Add up the ratings. A total of 3 should indicate that the article is a report of a research study. A total of 0–2 likely indicates that the article does not report a full research study and instead reports another type of article such as a literature review.

Criteria	Rating		Your Evidence and/or Reasoning
	0 = No	1 = Yes	
1. Terms are present that identify the report as research, such as <i>study</i> , <i>investigation</i> , <i>empirical research</i> , or <i>original research</i> .			
2. The authors describe gathering data.			
3. The authors describe analyzing the gathered data and report results of the analysis.			
<b>Overall Determination</b>  0–2 = Likely not research 3 = Likely research	<b>Total Score =</b>		<b>My Overall Determination =</b>

types of writings that you may be familiar with and may encounter as you read about topics that interest you, such as literature reviews; opinion papers; and creative writing, such as fictional stories. In addition, the table provides an example of how each type of writing might be applied to the topic of children's physical activities. In most of the forms of scholarly writing listed in Table 1.1, the authors start by posing a question in some way, but only in research studies will the authors report the systematic collection

**TABLE 1.1** Different Types of Writings About Topics

Type of Writing	Typical Use	Example
Research	To collect and analyze data in order to increase our knowledge about a topic or issue	The author collected and analyzed data about daily time spent being physically active for children in first through seventh grades
Literature Review	To summarize and critique a collection of different writings about a topic	The author summarized 18 writings available in the literature about children's physical activity
Theoretical Discussion	To synthesize ideas about a topic into a framework or model that identifies key concepts and how they are related to each other	The author developed a model of the factors believed to encourage and discourage children to be physically active
Opinion Paper	To provide one individual's opinions on a topic based on his/her experiences and perspectives	The author provides her opinions on promoting children's physical activity levels based on 25 years as an elementary school physical education teacher
Program Description	To provide a description of the features involved in the implementation of a particular program from the individuals who are running the program	The author describes a special "Get Active!" program used at one middle school
Fiction Writing	To tell a story about a topic that engages the reader to think about that topic	The author tells a story of three girls growing up and playing together on a volleyball team
Poetry	To bring forth an emotional response on a topic through creative uses of language	The author creatively uses words to convey one man's memories of running through the fields by his house as a child to convey the meaning of physical activity for one person

and analysis of data to answer the question. Therefore, when you want to identify whether a written document is an example of research, focus on the collection and analysis of data as the key indication that the document reports a research study.

With these ideas in mind, let's apply the definition of research and the rating scale in Figure 1.1 to two example abstracts taken from articles found in the literature.

**Example 1—Identifying an article that is a research study**

*An abstract written by Carrington, Templeton, and Papinczak (2003, p. 211):*

This qualitative study investigated the perceptions of friendship faced by teenagers diagnosed with Asperger syndrome. This research aimed to provide teachers with an insight into the social world of Asperger syndrome from a student perspective. A multiple-case study approach was used to collect data from 5 secondary school students in Australia. Data were collected through the use of semistructured interviews. An inductive approach to data analysis resulted in a number of broad themes in the data: (a) understanding of concepts or language regarding friendships, (b) description of what is a friend, (c) description of what is not a friend, (d) description of an acquaintance, and (e) using masquerading to cope with social deficits. The insights provided by the participants in this study are valuable for teachers, parents, and anyone else involved in inclusive education.

Using the rating scale in Figure 1.1, we can conclude that this article is describing a research study. Notice how the authors used key words in the first few sentences, including *study*, *investigated*, and *research*, when referring to their work. This abstract also clearly satisfies items 2 and 3 on the rating scale because the authors indicate that they collected data (“data were collected through the use of semistructured interviews”) and analyzed the data (using “an inductive approach to data analysis”).

**Example 2—Identifying an article that is NOT a research study**

*An abstract written by Amatea, Smith-Adcock, and Villares (2006, p. 177):*

This article presents an overview of a research-informed family resilience framework, developed as a conceptual map to guide school counselors' preventive and interventive efforts with students and their families. Key processes that characterize children's and families' resilience are outlined along with recommendations for how school counselors might apply this family resilience framework in their work.

This article presents an interesting and scholarly discussion of issues and theories related to family resiliency and the implications for school counselors. Although the abstract refers to research conducted by others (“a research-informed family resilience framework”), it does not satisfy the criteria in the rating scale. Notice that the authors used terms such as *overview*, *developed*, and *outlined* when referring to their work. There is also no indication that the authors collected or analyzed any data based on the information provided in the abstract. Therefore, this article is *not* an example of research, but instead is an example of a theoretical discussion.

## What Do You Think?

Consider the following abstract from an article about a vocabulary instruction program. Does this article report a research study? Why or why not?

*An abstract written by Aphorpe (2006, p. 67):* The author examined the effectiveness of a vocabulary intervention that employed structured, supplemental story read-alouds and related oral-language activities. Within each of 7 Title I schools across 2 sites, 15 third-grade teachers were randomly assigned to either use the intervention (treatment condition) or continue their usual practice (control condition). Trained test examiners administered oral and sight vocabulary pre- and posttests and reading achievement posttests. At 1 site, students in treatment, compared with control, classrooms performed significantly higher in vocabulary and reading achievement. In the other site, the intervention was not more effective. Contextual factors and student characteristics appeared to affect the results.

### Check Your Understanding

From this abstract, we can conclude that this article does report a research study. The author did not use the word *study*, but she notes that she “examined” an issue. We also have direct evidence that the author collected data (“oral and sight vocabulary pre- and posttests and reading achievement posttests”). Clues that these data were also analyzed are found by noting that the two groups of students were compared and different types of results from the analysis are reported (e.g., students in the treatment classrooms performed significantly higher).

## Why Do You Need to Read Research Reports?

Now that you are able to identify reports of research, it is important to next consider *why* you might want to read research reports that you identify. It turns out that the reason to read research is actually suggested by its definition. Recall that research is defined as a process of steps used to collect and analyze information to increase our knowledge about a topic or issue. So far we have focused on the first half of the definition that emphasizes the collection and analysis of data, but the second half of the definition is just as important. The reason that researchers conduct and report research studies is to add to the overall knowledge base that exists about a topic. In fact, the primary way that new knowledge is gained about important issues is by scholars conducting research. Researchers are much like bricklayers who build a wall brick by brick with each study. They continually add to the wall by conducting studies about an issue and, in the process, create a stronger structure or understanding.

Whether you are a teacher, counselor, administrator, nurse, special educator, social worker, or other practitioner, the knowledge base of your profession is continually advancing because of the research that is being conducted and reported. When researchers create a strong understanding from many research studies, this understanding also can provide a strong knowledge base for practitioners. Therefore, you need to read research in order to take advantage of the new knowledge that is generated for your own knowledge base, position in policy debates, and practices.

### Read Research to Add to Your Professional Knowledge

No matter how experienced you are in your practices, new problems continue to arise. For example, today we face problems such as increased violence in our schools, the increased use of technology by individuals, and rising rates of childhood obesity. You can be better equipped to develop potential solutions for problems such as these if you remain up to date in your field and continue to add to your knowledge base. Research can play a vital role in our understanding of problems because researchers study questions to which the answers are previously unknown. For example, you can better understand the problem of school violence if you read research studies that provide knowledge about the extent of violence in schools, the factors that encourage and discourage violence, and the meaning that school violence has for individuals. By reading what researchers have learned, you add to your own knowledge about a topic.

### Read Research to Inform Your Position in Policy Debates

Research also creates conversations about important policy issues. We are all aware of pressing issues being debated today, such as policies regarding immigrants and their children, policies about access to health care, and policies that mandate the use of high-stakes testing. Policy makers range from federal government employees and state workers to local school board members, council members, and organization administrators. These individuals take positions and make decisions on issues important to constituencies. For these individuals, research offers results that can help them weigh various perspectives. By reading research on issues related to policies, you become informed

about current debates and stances taken by other public officials as well as form your own opinions. For example, research useful to policy makers might examine the alternatives to welfare and the effect on children's schooling among lower income families, or it might examine the arguments proposed by the opponents and proponents of school choice.

## Read Research to Improve Your Practice

The third reason that it is important to read research is to improve your practice—that is, to improve your ability to do your job effectively. Armed with results based on rigorous research, practitioners become professionals who are more effective, and this effectiveness translates into better outcomes, such as better learning for children or improved mental health for individuals.

### *Here's a Tip!*

When reading a research study, look for recommendations for how the results apply to practice. These suggestions are usually listed near the end of the report and may be found under a heading such as *Implications for Practice*.

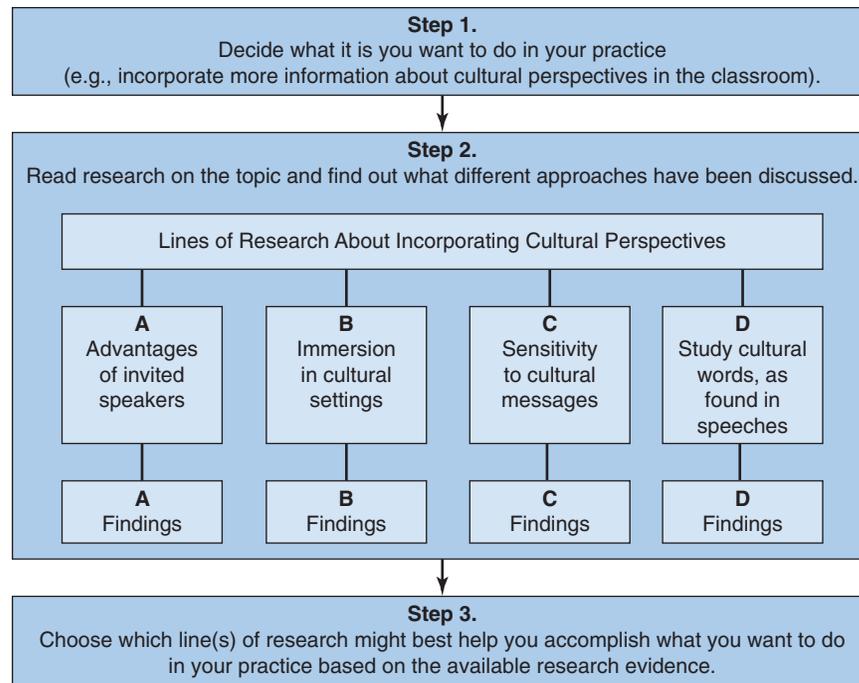
Today there is a push for practitioners across disciplines to use evidence-based practices. **Evidence-based practices** are personal and professional practices that have been shown to be effective through research. This means that individuals are encouraged to use practices for which there is support from research (the evidence) and not to rely solely on practices that have been done in the past. Here are three ways that research can influence your practices:

- **Reading research can suggest improvements for your practice.** When researchers conduct studies to add to our knowledge about a topic, this new knowledge may result in specific suggestions for how your practice can be improved. You can learn about these suggestions by reading research reports and looking for statements at the end of the report where the authors explain the implications of the results that might pertain to your practice. For example, in a study about youth literacy habits, Nippold, Duthie, and Larsen (2005) concluded their research report with suggestions for numerous programs that could be initiated by speech-language pathologists to promote youth reading habits for all students, including those with language disorders.
- **Reading research can help you improve practice by offering new ideas to consider.** You can learn about new practices that have been found to be effective in other settings or situations by reading research. For example, a high school counselor concerned about the smoking rates of students placed at risk in her school may read about a peer-counseling program reported from a different location that was found to help adolescent smokers successfully quit smoking. She could use the results of the research that she read to consider the idea of starting a peer-counseling program at her own school.
- **Reading research can help you learn about and evaluate alternative approaches to use.** In many situations, there are multiple approaches that could be used in our practices. We may learn about these approaches from reading research or because they are suggested by other practitioners or policy makers within our professional settings. When faced with multiple alternatives in your practice, reading research can help you not only identify alternative approaches, but also choose the best approach from among the alternatives. When you read several research studies that have been conducted for different approaches, you can evaluate and compare the evidence that is available for the effectiveness of the different approaches. Connelly and Dukacz (1980) provided a useful process that you can use to sift through available research studies to learn about different approaches and determine which will be most useful for your situation. The process is demonstrated in Figure 1.2, which focuses on three steps that practitioners might use to select a new strategy to implement in their practice.

As shown in the figure, a reading teacher decides to incorporate more information about cultural perspectives into the classroom and wants to find the best strategy that will increase students' understanding of multiculturalism. By reading research on the topic, this teacher learns about four lines of research that suggest alternative strategies. Research suggests that incorporating diverse cultural perspectives may be done with classroom interactions by inviting speakers to the room (line A) or by having the children consider and think (cognitively) about different cultural perspectives by talking with individuals at a local cultural center (line B). It may also be accomplished by having the children inquire into cultural

**FIGURE 1.2**  
Using Lines of  
Research to  
Evaluate  
Alternative  
Approaches to  
Practice

Source: Adapted from  
Connelly and Dukacz,  
(1980), p. 29.



messages embedded within advertisements (line C) or by having them identify the cultural subject matter of speeches of famous Americans (line D). By critically reading the available research and the findings for each approach, the reading teacher can use the available information to weigh the different strategies and select the one to implement that has research-based evidence for its effectiveness at improving students' multicultural perspectives.

## What Do You Think?

Consider the scenario introduced at the start of this chapter in which professionals are thinking about starting a program to encourage children to be more physically active at school. What are three reasons why you should read research about children's physical activity if you worked at this school?

## Check Your Understanding

There are many possible reasons why you would want to read research about children's physical activity. Recall that researchers conduct and report research studies to add to the knowledge about a topic. Therefore, you can read research about children's physical activity to learn what the overall state of knowledge is about this topic. You should also read research studies to inform your position in the school's debate about whether to initiate a policy for a new physical activity program. Finally, you could read research to inform your practices. By reading and evaluating different lines of research about children's physical activity, you could learn about approaches for getting children to be more physically active at school, such as increasing time for recess and physical education class each week, incorporating a morning workout program at the start of the school day, or having students set daily activity goals.

Did you come up with similar reasons? Now consider some reasons why you need to read research on a topic related to your own professional practice.

## Where Do You Find Reports of Research?

We hope you are convinced that it is important for you to read research to learn about the current state of knowledge about topics that interest you, to understand different sides of policy issues, and to improve your practices. If so, your next question might be: Where do I find reports of research to read? It turns out that you can find research discussed in a variety of published formats. Because the goal of research is to add to knowledge about various topics, researchers report their studies in formats where many different audiences, including other researchers and practitioners, can read and learn from them. In Chapter 4, we will discuss strategies you can use to find good research studies in the literature on specific topics that interest you. For now, it is helpful to simply start with an introduction to the different formats where you might read reports of research studies.

Figure 1.3 illustrates several different types of documents where you can find reports of research. Modified from a classification originally developed by Libutti and Blandy (1995), the figure is a guide to types of available published documents, including books, journal articles, and early stage materials. Let’s examine these formats by considering a brief description and examples of each.

- **Books.** Books (including e-books) are major publications on a topic that are typically hundreds of pages in length and screened for quality by editors and/or book publishers. There are several types of books where you can find reports of research discussed. Reference summary books such as encyclopedias and handbooks provide overviews of available research written by a group of leading specialists in the field. These books discuss many research studies that have been conducted within a topic area. For example, the following handbook for nurses provides an overview of an extensive amount of research available about patient safety and quality:

- Hughes, R. G. (Ed.) (2008). *Patient safety and quality: An evidence-based handbook for nurses*. Rockville, MD: Agency for Healthcare Research and Quality.

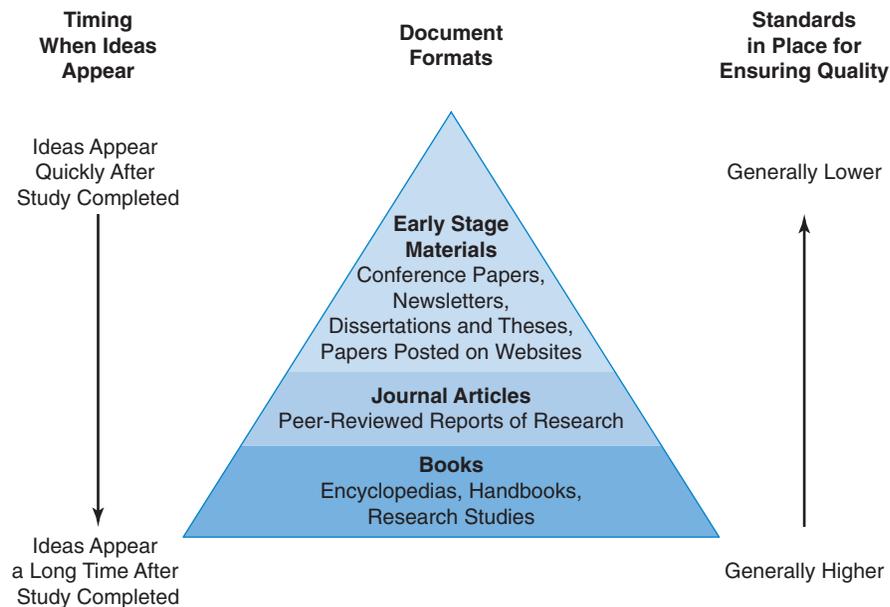
You can also find books that report on the results from single research studies. For example, the following book describes Winkle-Wagner’s (2009) research study about Black women’s experiences in college:

- Winkle-Wagner, R. (2009). *The unchosen me: Race, gender, and identity among Black women in college*. Baltimore, MD: The Johns Hopkins University Press.

When reading about research on a topic, books can be advantageous to read because they are a format that is familiar to you, can provide you with a good introduction to the topic, and typically include an extensive amount of information. You should

**FIGURE 1.3**  
Different Types  
of Documents  
Where Research  
Reports Are  
Found

Source: Adapted from Libutti and Blandy (1995) and Creswell (2008).



also keep in mind that because books represent major publications, they take time to be produced and usually will not include the most recent research findings. Also, they tend to be expensive (especially handbooks and other reference books) and therefore can be difficult to obtain unless available in a local library.

- **Journal articles.** Journals are periodical publications that publish collections of scholarly papers that relate to specific topics and are screened for quality by the editors and reviewers associated with the journal. You find scholarly journals published on printed paper and/or as documents available online. There are thousands of different scholarly journals that focus on publishing reports of research across all the different disciplines. A few examples of journals that represent this diversity include
  - *Journal of Educational Research*
  - *Journal of Counseling and Development*
  - *Early Childhood Research Quarterly*
  - *Journal of Marriage and Family*
  - *Journal of Professional Nursing*
  - *Research Quarterly for Exercise and Sport*

Scholarly journals such as these are published in “volumes” and “issues.” Typically, each volume covers one 12-month period and, within each 12 months, a journal publishes a set number of issues on a regular schedule such as monthly or quarterly (similar to popular magazines that you may read). That is, if a journal is published on a monthly basis, then one volume includes 12 issues. Within each issue of a journal, you find several individual articles written by different authors. Journal articles that report research studies are typically on the order of 5–25 pages in length and are written by the individuals who actually conducted the research. For example, here are two separate articles that appeared in the fourth issue of volume number 45 of the *Journal of Nutrition Education and Behavior*:

- Munoz-Plaza, C. E., Morland, K. B., Pierre, J. A., Spark, A., Filomena, S. E., & Noyes, P. (2013). Navigating the urban food environment: Challenges and resilience of community-dwelling older adults. *Journal of Nutrition Education and Behavior, 45*(4), 322–331.
- Bellows, L., Spaeth, A., Lee, V., & Anderson, J. (2013). Exploring the use of storybooks to reach mothers of preschoolers with nutrition and physical activity messages. *Journal of Nutrition Education and Behavior, 45*(4), 362–367.

When reading about research on a specific topic, journal articles are generally the best source because they provide the details of the research from the viewpoint of the researchers who actually conducted the study. Research journal articles represent formal research publications that provide more details about the process of the original research than book sources (which tend to focus mostly on the results and provide little detail about the research process). Journal articles can also be more challenging to read because they report many details about the process of research in a concise way without much explanation. Although the content of this book applies to reading about research in all three of the highlighted formats, we specifically focus on how to understand research reported as journal articles so that you will develop the knowledge and skills you need to read and evaluate research studies that have been reported in this important format.

#### *Here's a Tip!*

Although you may be more accustomed to reading books about problems that concern you, focus on reading recent research studies published as journal articles to learn the most up-to-date information in your profession.

- **Early stage material.** The final major category of literature highlighted in Figure 1.3 comprises materials at an early stage of development. Such early stage material consists of study reports posted to websites, papers presented at conferences, professional-association newsletters, drafts of study reports available from authors, and student theses and dissertations. For example, the National Art Education Association website includes a page dedicated to resources that includes relevant research:

- National Art Education Association. (2013). *Research and knowledge resources*. Retrieved from <http://www.arteducators.org/research/research>

Early stage materials are typically formats that are more informal than books or articles and may or may not go through a formal publication process. Sometimes early stage materials are referred to as “grey literature” to indicate the lack of formality in the publication process. Despite the informality, there is no doubt that information about research studies posted to websites and available online represent a growing

source of research that you may choose to read. This type of literature can be interesting because it is where new ideas and results may first appear. Unfortunately, because this work is typically early in its development, it also means that reviewers (e.g., journal editors or book publishers) have likely not monitored them to ensure their quality. Therefore, although early stage research materials are easily accessible, you must be cautious of the conclusions until the results appear in more rigorous outlets, such as scholarly journals.

In summary, when you read research to add to your knowledge, inform your position on policies, and improve your practice, we recommend that you focus on journal articles, but you may find research reported in the other discussed formats of interest too. Before we move forward to consider how you actually read the information provided in a research report, this is a good place to pause for a brief commentary about how we presented source information for the different examples above.

You may have noticed in the examples that the way we presented source information for a book looked a little different from a journal article, which looked a little different from a website. Because of the importance of being able to accurately and precisely present source information for a given document, researchers and practitioners have developed style manuals to guide how individuals identify different types of research reports. **Style manuals** provide a structure for identifying references, as well as other aspects of writing such as the format of headings. (You will learn more about headings in Chapter 4.) Numerous style guides are available that discuss formats for writing a research report. The choice of a style guide is usually determined by someone else, such as your teacher, your graduate program, or your professional association. The *Publication Manual of the American Psychological Association*, 6th edition (APA, 2010) is the most popular style guide in educational and social research. We follow the APA style guidelines throughout this book, and you can find an example of a paper written using APA style in the Appendix. For now, examine the models provided in Table 1.2 to learn how to present source information for different types of research documents using APA style.

## What Do You Think?

Note the following source information about a research study published as an article in the *Journal of Autism and Developmental Disorders*. Using the model in Table 1.2 and information below, write a reference for this article using APA style. Pay careful attention to the use of uppercase letters and italics in your response.

*Article Title:* Use of Songs to Promote Independence in Morning Greeting Routines for Young Children with Autism

*Author Names:* Petra Kern, Mark Wolery, and David Aldridge

*Volume Number:* 37

*Issue Number:* 7

*Year of Publication:* 2007

*Pages of the Article:* 1264–1271

## Check Your Understanding

A reference for this research report in APA style is:

Kern, P., Wolery, M., & Aldridge, D. (2007). Use of songs to promote independence in morning greeting routines for young children with autism. *Journal of Autism and Developmental Disorders*, 37(7), 1264–1271.

**TABLE 1.2 Models for How to Document Different Formats of Research Reports Using the APA (2010) Style**

Format	Document Type	Model in APA Style*	Example of the Model
Books	Summary reference book prepared by editors	Editor1, E. E., & Editor2, E. E. (Eds.). (Year). <i>Title of edited book</i> . City, ST: Publisher Name.	Damico, J. S., Muller, N., & Ball, M. J. (Eds.). (2010). <i>The handbook of language and speech disorders</i> . Oxford, UK: Blackwell Publishers.
	Book about a research study prepared by the researcher	Author, A. A. (Year). <i>Title of book</i> . City, ST: Publisher Name.	Pipher, M. (2002). <i>The middle of everywhere: Helping refugees enter the American community</i> . Orlando, FL: Harcourt.
Journal articles	Article from journal published in print	Author1, A. A., Author2, A. A., & Author3, A. A. (Year). Title of the article. <i>Name of the Journal, Volume#(Issue#)</i> , page#–page#.	Harr, N., Dunn, L., & Price, P. (2011). Case study on effect of household task participation on home, community, and work opportunities for a youth with multiple disabilities. <i>Work, 39</i> , 445–453.
	Article from journal published online	Author1, A. A., & Author2, A. A. (Year). Title of the article. <i>Name of the Online Journal, Volume#(issue#)</i> . Retrieved from <a href="http://www.website">http://www.website</a>	Schnepper, L. C., & McCoy, L. P. (2013). Analysis of misconceptions in high school mathematics. <i>Networks: An Online Journal for Teacher Research, 15</i> (1). Retrieved from <a href="http://journals.library.wisc.edu/index.php/networks/issue/view/52">http://journals.library.wisc.edu/index.php/networks/issue/view/52</a>
Early-stage materials	Website	Author, A. A. (Year, Month day of posting). <i>Title of webpage</i> . Retrieved from <a href="http://www.website">http://www.website</a>	U.S. Department of Education (2013, June 7). <i>Race to the Top fund performance</i> . Retrieved from <a href="http://www2.ed.gov/programs/racetothetop/performance.html">http://www2.ed.gov/programs/racetothetop/performance.html</a>
	Conference paper	Author, A. A. (Year, Month). <i>Title of paper</i> . Unpublished paper presented at Conference Name, Location.	McKinney, T. R. F., Plano Clark, V. L., Garrett, A. L., Badiie, M., & Leslie-Pelecky, D. (2012, April). <i>Professional identity development through a nontraditional program for STEM graduate students: A grounded theory study</i> . Unpublished paper presented at the American Educational Research Association 2012 Annual Meeting, Vancouver, BC, Canada.
	Dissertation	Author, A. A. (Year). <i>Title of the dissertation</i> (Unpublished doctoral dissertation). Name of Institution, Location.	Morales, A. (2008). <i>Language brokering in Mexican immigrant families living in the Midwest: A multiple case study</i> (Unpublished doctoral dissertation). University of Nebraska—Lincoln, Lincoln, NE.

\*When using the APA style, list the authors' names in the order they appear in the report and provide the full last names and initials for the first and middle names. Also, pay particular attention to (a) the use of italics because book titles and journal names are italicized, but article titles are not and (b) the use of capital letters because all major words in journal names are capitalized, but those in book titles or article titles are not.

## What Steps Do Researchers Take When Conducting Their Studies?

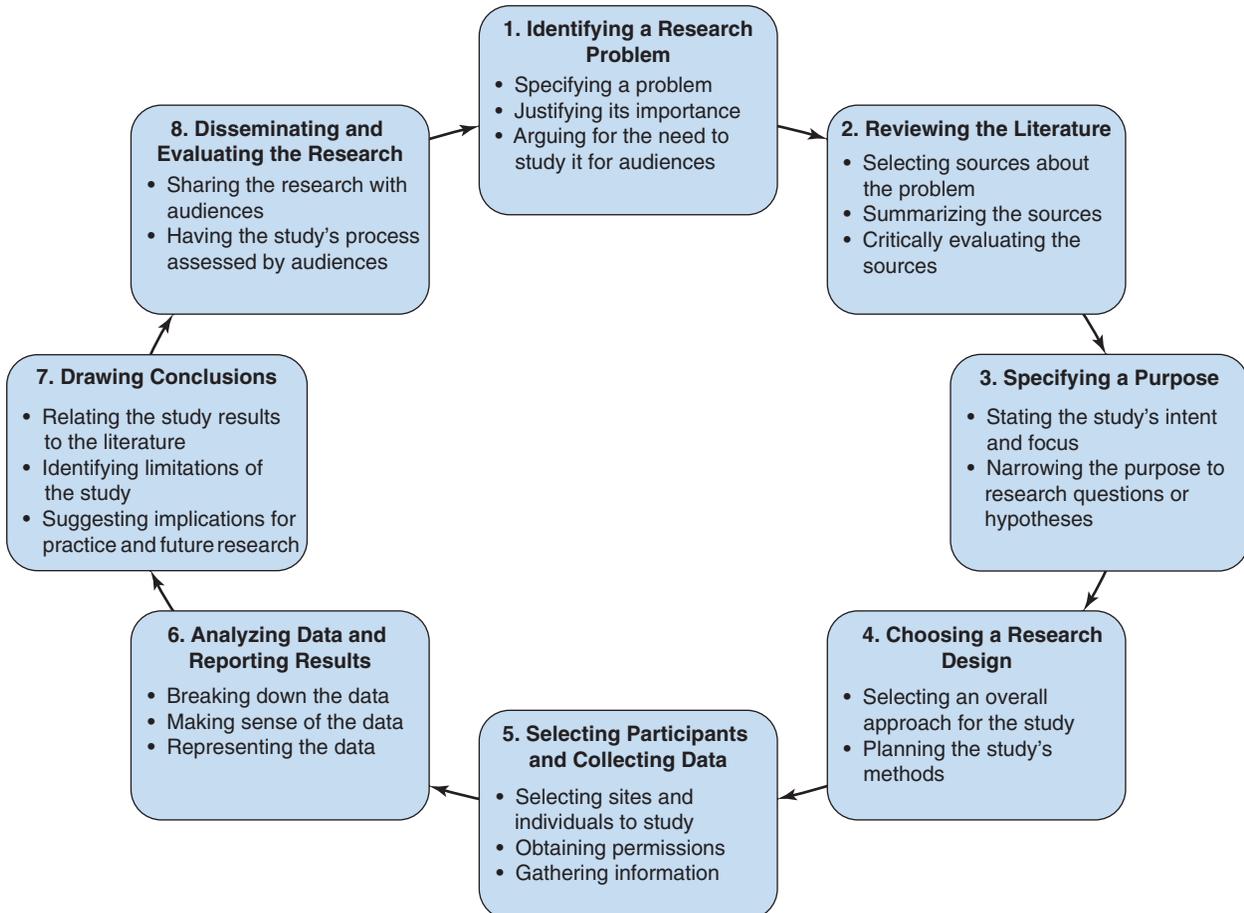
Now that you know how to identify research, know why you would want to read research, and know the formats where research is reported, you are ready to consider how to read and interpret the information that researchers include in their study

reports. Reading research can be challenging, particularly when you are new to it. This is because the process of conducting research is a specialized activity, and researchers use a specialized style of writing when they report their research studies in a format such as journal articles. This means that to be a critical consumer of research articles, you need to develop both an understanding of the process that researchers use when they conduct their studies and an understanding of the way that researchers describe this process in their reports. Therefore, before we turn our attention to how to read the information in research reports, we need to first introduce the steps that researchers take in their research studies.

As already indicated in the general definition of research provided at the start of this chapter, researchers complete several steps when they conduct a research study, including posing a question, collecting data, and analyzing the data. In formal research, the steps of research were historically identified as the “scientific method” based on the procedures used to conduct research in the physical sciences such as chemistry and physics. Using a “scientific method,” scientists pose a question, make a prediction, gather relevant data, analyze the data to test the prediction, and interpret the result to see whether it resolves the question that initiated the research.

The steps of the scientific method provide the foundation for how researchers conduct educational and social research today. Although not all studies include predictions, researchers do use a process of steps whenever they undertake a research study. As shown in Figure 1.4, the **process of research** that researchers use in educational and social research consists of several key steps:

- identifying a research problem,
- reviewing the literature,
- specifying a purpose,
- choosing a research design,



**FIGURE 1.4** The Steps of the Process of Research

- selecting participants and collecting data,
- analyzing data and reporting results,
- drawing conclusions, and
- disseminating and evaluating the research.

These eight steps provide a useful framework that describes what researchers do when they conduct their studies and the information they ultimately include in their reports. To understand how this process unfolds in a study, let's examine these steps one by one in a little more detail.

### Step 1—Identifying a Research Problem

Researchers begin conducting a study in their topic area by identifying a problem to study—typically an issue, concern, or problem in society that needs to be resolved. **Identifying a research problem** consists of the researcher specifying an issue that needs to be studied, developing a justification for studying it, and suggesting the importance of the study for audiences that will read the report. By specifying a problem in a research study, the researcher limits the subject matter and focuses attention on an important aspect of the topic. Some examples of research problems include the increasing violence in high schools, the distractions caused by middle school students' cell phone use, and the difficulty of finding adequate foster parents. Researchers study these problems when there is a need to add to the knowledge available about them.

### Step 2—Reviewing the Literature

Once researchers have specified a research problem, it is important that they learn what knowledge has already been found by other researchers who have studied the same problem. Researchers plan their studies so that they build on and add to the accumulated knowledge about the topic, and so they do not repeat a study that has already been done. Because of these concerns, reviewing the literature is an important step in the research process. **Reviewing the literature** means that researchers locate books and journal articles on a topic, choose the literature to include in their review, and then summarize and critically evaluate the included literature. Researchers write a literature review passage that conveys what is and is not known about the topic of the research study, and they use this background information to plan their studies and to interpret the results at the end of the study.

### Step 3—Specifying a Purpose

After identifying a broad research problem and reviewing the literature related to the problem, researchers next focus this problem to a specific intent for their study. **Specifying the purpose for research** consists of identifying the major intent or objective for a study and narrowing it into specific research questions to be answered or hypotheses to be tested. Researchers write a purpose statement that indicates the major focus of the study, what they want to learn, the participants that they will study, and the location or site where the study will take place. Researchers narrow their purpose statements to research questions or predictions that the researcher plans to address in the research study. This important step sets the direction and goals for a research study.

### Step 4—Choosing a Research Design

Once researchers have specified a purpose for their study, they need to choose the approach that they will use to accomplish this purpose. **Choosing a research design** involves the researcher designing an overall plan for the study's methods—that is, an overall plan for selecting participants, collecting data, analyzing data, and reporting the results. Researchers first choose a research approach, such as a "quantitative" approach that emphasizes collecting and analyzing numbers, a "qualitative" approach that emphasizes collecting and analyzing words and images, or a "combined" approach that emphasizes collecting both

numbers and words or images. Within the overall approach, researchers choose a particular design, or plan, that is best suited for addressing their study's purpose and answering their questions.

### Step 5—Selecting Participants and Collecting Data

An essential aspect of any research study is the collection of data from participants to serve as the basis for answering the research questions and hypotheses. With a research design planned, the researcher turns to this critical step. **Selecting participants and collecting data** means that researchers select settings and individuals for a study, obtain necessary permissions to study them, and gather information by asking people questions or observing their behaviors. Of paramount concern in this process is the need to obtain accurate data from individuals in an ethical manner. This step produces a collection of numbers (e.g., test scores or frequency of behaviors) or words (e.g., responses, opinions, or quotes), depending on the study's research design. The researcher collects these data to answer the research questions of the study.

### Step 6—Analyzing the Data and Reporting Results

Once researchers collect data, they next have to make sense of the information supplied by the participants in the study. While **analyzing the data**, researchers take the data apart to determine individual responses and then put the data together to summarize the information. When **reporting results**, researchers summarize the patterns they found from the analysis of the gathered data and represent these patterns in tables, figures, and discussions. This step produces the results and findings of a research study.

### Step 7—Drawing Conclusions

Researchers end their studies by drawing conclusions about what they have learned. **Drawing conclusions about the research** means that researchers interpret the results that they obtained and explain how the results provide answers to the research questions. When researchers make interpretations and draw their conclusions, they often summarize the major results, compare the results to predictions or to other research studies, and suggest implications of the results for audiences. Researchers also consider the limitations of their studies and suggest implications of the results for practice and future research studies. This interpretation provides the conclusion to a research study.

### Step 8—Disseminating and Evaluating the Research

As a final step to research, researchers are expected to share their work publicly. Research can only add to the knowledge of specific subject matter if people in the field can read and learn about the research! The step of sharing a research study is called **disseminating research**. After conducting a research study, researchers develop a written report and distribute it to audiences (such as practitioners or other researchers) who can use the information. It is by researchers disseminating reports of their research that studies can make a difference for the problems in society.

Researchers also share their research studies so other researchers and practitioners can evaluate the studies' procedures and results. **Evaluating research** involves individuals assessing the quality of a research study. For example, most research journals use a process called "peer review," in which experts in the field independently evaluate each study report to determine whether it is worthy of being published in the journal. This process is so important in research that research journals are often referred to as "peer-reviewed journals." Different audiences use different standards for judging the quality and utility of a research study. Researchers evaluate a study based on the quality of its literature, data collection and analysis procedures, and results. Practitioners consider the procedures, but often focus on how useful they find the implications of the study's results. Disseminating and evaluating research are an essential part of

#### *Here's a Tip!*

By reading and assessing the quality of published research reports, you actively participate in the research process by assisting with the dissemination and evaluation of research studies.

the research process so that studies and new knowledge are continually examined and critiqued by the larger community of researchers and practitioners interested in the study's topic.

By knowing about these eight steps, you now have a better idea about the process that researchers undertake when conducting their studies. Notice that the steps of the research process are illustrated as a cycle in Figure 1.4, which indicates how the conclusions, dissemination, and evaluation of one study often lead to the identification of a new problem, which starts the cycle for another research study. Consequently, researchers tend to keep cycling through these steps as they complete study after study. Most commonly, however, a research article reports what happens in only one cycle of the research process. In other words, most research articles disseminate information about the first seven steps of the process as implemented for one study.

Although Figure 1.4 and this discussion suggest that these steps occur in a neat and orderly way during a research study, that is rarely the case in practice. In many studies, the researchers implement two or more steps at the same time or go back and forth between two or more steps in an iterative (or repeating) fashion as the study unfolds. For example, as a researcher specifies the purpose for a study, he may realize that he needs to return to reviewing the literature to learn more about the problem so he can specify good research questions as part of the purpose. Another researcher may find that as she analyzes her collected data, she realizes she needs to go back and collect more data to fully answer her research question, which then requires that she complete more data analysis. Therefore, as you read research, it is important to keep in mind that the process of research is a dynamic, complicated process for researchers to complete and report. Despite the complexities inherent in a study's research process, these eight steps represent the major activities involved in all research studies, and they provide you with a useful framework for understanding the information that is included in research reports. Now that you have been introduced to the steps that researchers use in a formal research process, let's turn our attention to how you *read* the reports disseminated from formal research studies.

## How Do You Identify the Steps of the Research Process Within the Major Sections of a Research Article?

Learning to read and understand written texts is actually a challenging process that most of us continue to develop throughout our educational and professional development. You may think, "No big deal, I know how to read," but knowing how to read is not the same thing as knowing how to read and understand a particular type of text. Our ability to understand and critically evaluate the information in a text document is enhanced if we already possess knowledge about the content of the text *and* if we are familiar with the underlying structure of how the information is presented. For example, you are probably very good at reading and understanding narrative stories because you have life experiences that may be similar to the story; you also know that stories are typically told with a familiar structure that includes a plot with a beginning, middle, and end, conveying events that unfold for characters over time. The goal of this book is to give you both the necessary knowledge about the process of research and the knowledge about the structure and language used to describe that process so that you can understand and evaluate the information in research reports.

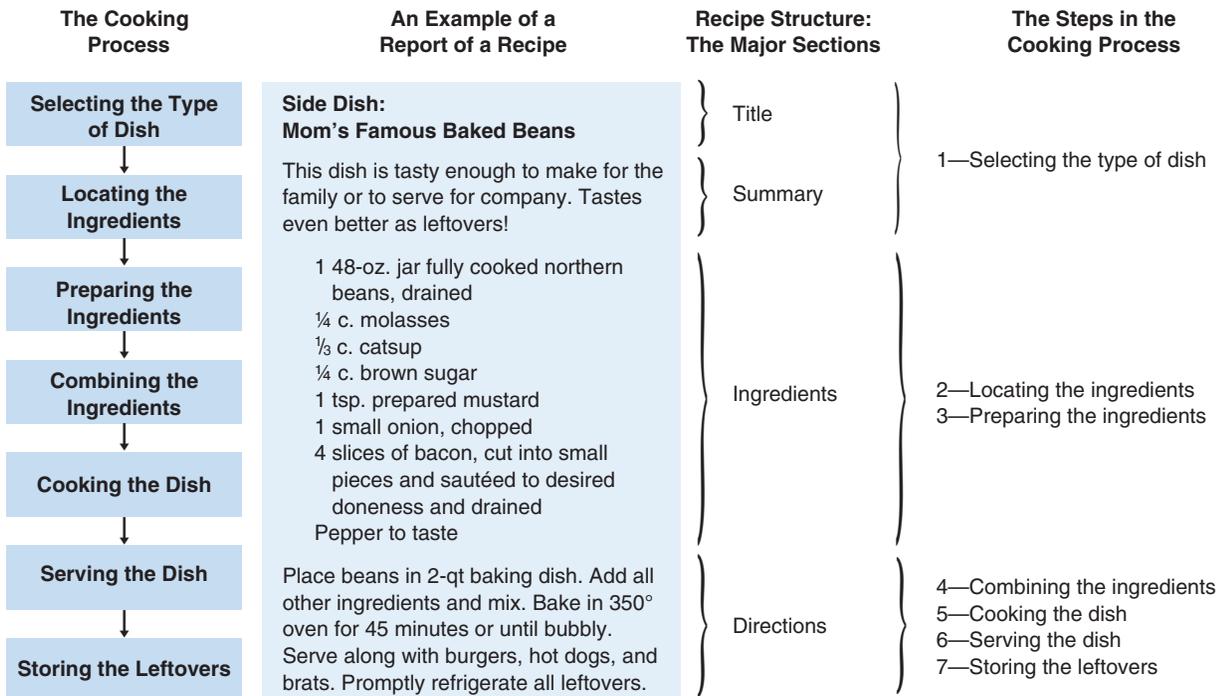
Before applying these ideas to understanding the structure in research reports, let's first consider how they apply to another common type of text document used to convey a complicated process—namely, recipes. The process of cooking and developing recipes is most definitely a complicated and dynamic process. As summarized in Figure 1.5, we can think of this process as including several key steps. Cooks begin with an idea and type of dish that they want to make. From there they locate and prepare the necessary ingredients, figure out how best to combine them, and how to cook the combination so that it is safe, tasty, and a pleasure to eat. Along the way they may taste the dish and determine whether they need to go back and adjust or add to the included ingredients. Once the dish is cooked, they consider how best to serve it and store any leftovers. In the end, they evaluate how well the recipe worked and whether people enjoyed eating it.

They make notes about any changes to try in the future. When cooks share the recipes they have developed, they use a standard structure to report the information about this complicated process. They also have developed a common set of vocabulary to describe important elements of the process (e.g., chop, sauté, bake, and tsp.). This recipe structure and vocabulary has developed over the years, and today just about any cookbook you read uses the same overall structure. An example of this recipe text structure is also provided in Figure 1.5 for a recipe for Mom’s famous baked beans. As you look at this structure, notice how it incorporates the steps of the process of cooking within the major sections of the recipe text.

If you are familiar with how to cook, then reading the example of the recipe in Figure 1.5 may seem trivial to you; however, that is actually the point. When you know the structure of the text, the information is much easier to understand. As with learning to read recipes, you can also learn to more easily read and understand research articles by developing your knowledge of the structure that researchers use to describe the information in their reports. Although the process of research is complex and includes many steps for a single study, over the years researchers have developed a general structure and specialized vocabulary for how they report their research studies. By learning to recognize this structure and key vocabulary, you will be well positioned to be a critical consumer of research reports that interest you!

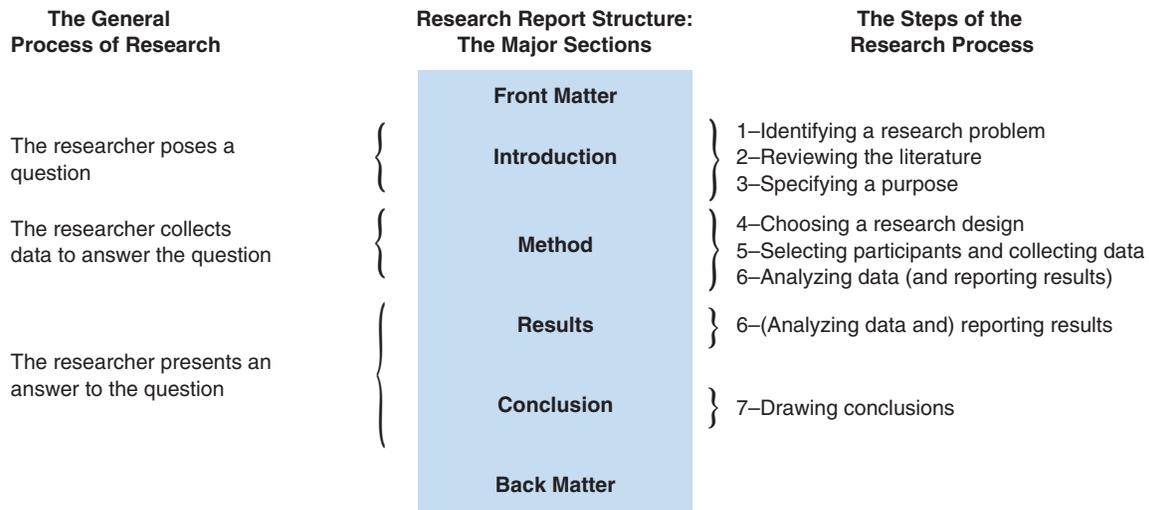
The first step to effectively reading research reports is to recognize the overall organizational structure used in the reports. When researchers write about their studies, they organize the information into several major sections. As shown in the center of Figure 1.6, research articles are typically divided into the following six major sections:

- Front matter
- Introduction
- Method
- Results
- Conclusion
- Back matter



**FIGURE 1.5** The Process of Cooking and the Structure of the Text Used for Recipes

Source: Recipe reprinted with permission of Ellen L. Plano.



**FIGURE 1.6** The Major Sections of a Research Article and the Steps in the Process of Research

Note: The final step of “disseminating and evaluating research” is represented by the entire published research article.

*Here’s a Tip!*

Researchers include headings in their reports to indicate the major sections and subsections. Use these headings to understand the overall structure of the report and the information that is presented.

The major sections provide an overall structure to the research articles that you read. With practice, you will learn to use these sections as landmarks to help you navigate through the information reported in articles. As you read a research study, you find information about the steps of the research process within the major sections of the report. Figure 1.6 indicates where each of the steps of the research process is typically discussed within the major sections. We do not list the final step, “disseminating and evaluating research,” in the figure because the whole report represents this step. Each of the major sections and details about the corresponding steps in the research process will be discussed in Chapters 3 through 14. We introduce them here so that you can begin to recognize the overall structure as you read a research report.

## Front Matter

All research reports begin with basic identifying information. The **front matter** of a research report includes the title, information about the authors, and a short abstract about the study. You find the front matter at the very start of the report document. Reading this information tells you what study is being reported and who conducted it.

- **The front matter includes the identifying information for the study report.** No matter the format used for a research report, you find that it begins with the researchers providing a short title for the reported study. Often the title identifies the topic, participants, setting, and/or approach to the research study. The title also provides a unique identification for the specific report. For a journal article, the name of the journal and the appropriate volume number and issue number will usually be identified near the article title.
- **The front matter identifies the authors of the study report.** Reports also identify the individuals who conducted the study and prepared the written report. The information about the authors in the front matter is typically limited to their names and the names of the institutions where they are each employed. The order of the authors’ names also often indicates their roles, with the person listed first most often being the researcher who led the writing of the report.
- **The front matter provides an abstract of the study report.** Recall that an abstract is a short summary of a research report prepared by the authors. It is a stand-alone paragraph that briefly highlights key steps in the study’s research process in a few words. Because abstracts are so short, they do not include all of the important details about the study, but they do provide a useful overview of the information that is

included in the report. You should read a study's abstract before reading the full report to obtain a quick overview of the content, which should help you understand the detailed information included in the full report.

## The Introduction Section

The main text of a research report begins with the Introduction section. Researchers generally begin their research articles with one or two introductory sections that introduce the study and provide background for the study being reported. You can identify these sections by looking for headings such as *Introduction*, *Problem Statement*, *Background for the Study*, *Conceptual Framework*, or *Literature Review*. In many studies, however, the main text begins right after the front matter with no specific heading provided for the Introduction section.

When you read an **Introduction section**, you can expect the researcher to report information about the first three steps of the research process: identifying a research problem, reviewing the literature, and specifying a purpose.

- ***The Introduction section begins by identifying the study's research problem.*** Researchers begin the text of their reports by identifying a research problem, which provides a rationale for the need for the study. In an opening passage that we call the "statement of the problem," researchers describe the topic and the problem and justify the importance of studying the problem for specific audiences such as practitioners and researchers. You will learn how to read a statement of the problem passage in Chapter 3, "Statements of the Problem."
- ***The Introduction section reports the review of the literature.*** Researchers include their literature review in their study reports either as part of the statement of the problem or as its own separate introductory section. In either case, researchers report what they learned from reviewing articles and books to document what is already known about the problem being studied. You will gain an understanding of how researchers use the literature review in their studies along with an understanding of the steps involved in writing a formal summary of the literature about a topic in Chapter 4, "Literature Reviews."
- ***The Introduction section ends with the specification of the study's purpose.*** Researchers include a statement of purpose at the end of the Introduction section. The statement of a study's purpose is the most important statement in a research study report. It specifies the focus of the study and what the researchers want to learn about this focus. Researchers also state research questions and hypotheses that narrow the study's purpose to the specific questions that will be answered. Chapter 5, "Purpose Statements, Research Questions, and Hypotheses," provides information about identifying and understanding the purpose of a research study.

## The Method Section

After the Introduction section(s) sets the context of the study, the researcher then reports the procedures used to conduct the study in the Method section. You can readily identify this important section because it is almost always designated with a clear heading such as *Method*, *Methods*, *Methodology*, or *Procedures*.

When you read a **Method section**, you can expect the researcher to describe the procedures used to implement the next three steps of the research process: choosing a research design, selecting participants and collecting data, and analyzing data and reporting results.

- ***The Method section begins by identifying the study's research design.*** When researchers conduct their studies, they choose an overall approach and research design for the study's procedures based on the specified purpose. The overall approach and research design guide the researchers' decisions about participant selection, data collection, and data analysis—that is, their decisions about their methods. Therefore, researchers identify the approach and research design as part of the description of their study's methods. You will be introduced to two overall approaches to research in Chapter 2, "Quantitative and Qualitative Research." In addition, Chapter 6,

“Quantitative Research Designs,” Chapter 9, “Qualitative Research Designs,” and Part Five, “Understanding Reports That Combine Quantitative and Qualitative Research,” describe different research designs that researchers use within the different approaches.

- **The Method section describes the procedures used to select participants and collect data.** The focus of a report’s Method section is to provide a detailed, technical discussion about the procedures that the researchers used for selecting the study participants and collecting data. Describing these procedures means the researchers discuss the setting for the research and who participated in the study, how permission to study these individuals was obtained, what data were collected, and how these data were gathered. Researchers collect many different types of data, such as asking participants to fill out forms or talking with them directly. Researchers provide detailed descriptions of the procedures they used in their reports. We discuss the procedures found in quantitative research studies in Chapter 7, “Participants and Data Collection,” and the procedures found in qualitative research studies in Chapter 10, “Participants and Data Collection.”
- **The Method section describes the procedures used to analyze the data.** After describing how the data were collected in the Method section, researchers often briefly describe the procedures they used to analyze that data. However, the details of the analysis and the results found from the data analysis are typically fully discussed in the report’s Results section.

## The Results Section

The **Results section** of an article represents the heart of the research study report. In fact, we have heard many students confess at the start of a course that in the past they have typically only read the Results section when reading research articles. Although the study results likely will remain of most interest to you, in this book you will learn how to understand and interpret them within the context of the whole study and article. The Results section is usually easy to locate in a research article because researchers usually title this section with the heading *Results* or *Findings*.

When you read a Results section, you can expect the researcher to describe one step in the research process: analyzing data and reporting results.

- **The Results section reports the details of and findings from the data analysis.** When researchers analyze the data they gathered, they prepare the responses for analysis, implement procedures to analyze the data, and summarize the results of the analysis in paragraphs, tables, and figures. They present the details of the study’s findings in the Results section, which is where you learn what the researchers found from their study. You will examine how quantitative types of data are analyzed and the results reported in Chapter 8, “Data Analysis and Results,” and how qualitative types of data are analyzed and the results reported in the similarly titled Chapter 11, “Data Analysis and Findings.”

## The Conclusion Section

Once the study results have been obtained, the next step occurs when researchers make interpretations about the procedures and results of the study. These interpretations appear within the **Conclusion section** of a report, which is often identified as the *Conclusion* or *Discussion* of the article.

When you read a Conclusion section, you can expect the researchers to describe the interpretations they made when implementing one step of the research process: drawing conclusions.

- **The Conclusion section reports the interpretations of the study.** Researchers end their study reports by summarizing the major results of the study and interpreting how the results answer the research questions stated earlier in the article. These interpretations include the researchers’ determination of whether the results confirm or disconfirm expected trends or predictions or examination of the meaning of the findings for study participants. They may also include comparisons of the study’s results with

those found in other published studies. In addition, researchers discuss the implications and limitations of the study as part of their interpretations. You will learn how to locate and understand these discussions in Chapter 14, “Conclusions.”

## Back Matter

All research reports end with important information that supports the content of the study report. The **back matter** of a research report includes information such as a list of references and extra materials such as appendices. The start of the back matter immediately follows the end of the Conclusion section(s).

- ***The back matter includes a list of references cited within the study report.*** When researchers write their study reports, they include citations to other related scholarly information. The citations are usually brief (such as the name of the authors and the year of the publication) within the main text, and the detailed information about each source is provided in the back matter. These reference lists are generally formatted in a consistent way, such as in the APA style introduced in Table 1.2.
- ***The back matter includes extra supporting materials.*** Researchers may include supporting information at the end of their reports such as end notes, appendices, and biographical information about the authors. These extra materials supplement the information about the research study discussed in the main body of the report.

When you read any research report, a good strategy is to start by identifying the major sections: front matter, Introduction, Method, Results, Conclusion, and back matter. When researchers use clear headings, these can be very easy to identify. However, in some studies the authors use different words and/or include multiple sections that fall within one of these major categories. For example, some study reports have one clear Introduction section, but many reports include two or more sections at the start of the report to convey the introductory information. Therefore, it is helpful if you start by identifying where each of the major sections begins and marking them in some way in the article using a marking pen if reading on paper or a comment box if reading in an electronic format. Once you locate the major sections of a report, you can use Figure 1.6 to recall which steps of the research process you expect to be described within each of the identified sections.

## How Should You Examine Research Articles That Interest You?

You have already learned a great deal about what research is, how researchers conduct it, and how it is reported. In addition, you now know why it is important for you to read, understand, and evaluate reports of research studies so that you can increase your knowledge about topics and improve your practices based on the results of good-quality research studies. You are likely eager to apply this new knowledge to actual reports of research studies, and you might be wondering how best to go about examining research reports. In this book, we will typically include three activities that will help you practice reading and evaluating research articles that interest you. By completing these activities, you will:

- ***First, read and annotate the research article.*** Reading a research article involves recognizing the basic content information about the study presented in the article. Start by noting what source you are examining and then write a complete, APA-style reference for the article. From there, identify the major sections and the basic information included within each section. Highlight key elements of the article and record notes in the margins that identify the elements you chose to highlight. You can use the highlighting tool and the notetaking tool in the Pearson etext as you read.
- ***Second, answer questions about the research article to guide your understanding.*** Understanding a research article involves making sense of the information about the study presented in the article. These activities will help you focus on key elements of

the articles, encouraging you to consider how these elements relate to the overall research approach. Eventually you will begin to ask yourself similar questions each time you read a research article.

- **Third, evaluate the research article.** Evaluating a research article involves making judgments about the quality of the research study—how it was conducted by the authors and also how it was presented in the article. The activities guide you through evaluating the methods the researchers used and the conclusions and implications the authors presented. We will include this activity as we discuss criteria to use when evaluating the key elements of any research study, beginning in Chapter 2.

To help you develop your skills for reading, understanding, and evaluating research articles, we have included eight complete research reports, published in quality journals, for you to apply these practice activities. The activities based on these articles give you the opportunity to apply the content covered throughout this book as you read, understand, and evaluate real research reports.

## Reviewing What You've Learned To Do

- **State a definition of research and use it to recognize reports of research studies.**
  - Research is a process of steps used to pose a question, collect data, and analyze the data to increase our knowledge about a topic or issue.
  - Reports of research can be identified when the authors refer to their work as a research study and report that they collected and analyzed data in the study.
- **Identify your reasons for needing to read research reports.**
  - Researchers, practitioners, and policy makers need to read research to learn new knowledge about specific topics, to become informed on policy debates, and to improve practice.
  - Reading research can improve practice by suggesting possible improvements, offering new ideas, and identifying and evaluating alternative approaches for practice.
- **Name different formats where you can find reports of research studies.**
  - Reports of research studies are found in books, journal articles, and early stage materials. These different formats often vary in length and in the extent to which they are reviewed for quality. In addition, APA style requires the use of a different reference model when presenting source information for a study report written as a book, journal article, or early stage material.
- **Name the steps in the process of research that researchers undertake when they conduct research studies.**
  - Researchers use an eight-step process of identifying a problem, reviewing the literature, specifying a purpose, choosing a research design, selecting participants and collecting data, analyzing data and reporting results, drawing conclusions, and disseminating and evaluating the study when they conduct formal research.
- **Identify the major sections of a research report, and know which steps of the research process are reported within each section.**
  - Research reports have six major sections: front matter, Introduction, Method, Results, Conclusion, and back matter. Researchers report information about seven steps in the research process within the major sections of a research article.
  - The Introduction section includes information about three steps of the research process: identifying a problem, reviewing the literature, and specifying a purpose.
  - The Method section includes information about two steps of the research process: choosing a research design and selecting participants and collecting data. This section may also include information about data analysis from the step of analyzing data and reporting results.
  - The Results section includes information about the step of analyzing data and reporting results.
  - The Conclusion section includes information about the step of drawing conclusions.

- **Read a research report and recognize the information included about a study's research process.**
  - When reading a research report, first note the source by writing an APA-style reference and recognize the overall organizational structure of the report by identifying where each major section appears. Then, use the research process to guide your understanding of the information within each section of the report. Finally, evaluate the research study based on the quality of the authors' implementation of the research process.

✓ **To assess what you've learned to do, click here to answer questions and receive instant feedback.**

## Reading Research Articles

At the end of this chapter, you will find two research articles to help you start practicing your new skills. The first article was written by Furong Xu, Jepkorir Chepyator-Thomson, Wenhao Liu, and Robert Schmidlein and was published in 2010 in a journal called *European Physical Education Review*. We will refer to this article as the “quantitative physical-activity-in-middle-schools” study. The second article was written by Patricia Tucker, Melissa M. van Zandvoort, Shauna M. Burke, and Jennifer D. Irwin and was published in 2011 in the *Journal of Early Childhood Research*. We will refer to this article as the “qualitative physical-activity-at-daycare” study.

As you read these two studies, pay special attention to the marginal annotations that we have included with the articles. These annotations signal the major characteristics of quantitative and qualitative research, which will be discussed in Chapter 2. In Chapter 2 we will reflect back on these two articles frequently to demonstrate the authors' use of those characteristics. In addition, please bear in mind that these articles may seem difficult to understand. Reading research studies will become easier in time as you learn to recognize the basic features and structure of good research. For now, here are a few tips that will facilitate your reading:

- Look for cues for the major ideas by examining the headings and recalling the general structure of a research report, summarized in Figure 1.6.
- Keep in mind that research is a process consisting of several steps. As you read, look for indications of the major steps of the research process: problem, literature review, study purpose, participant selection and data collection, data analysis and results, and conclusions.
- Look for the most important statement in the study—the purpose statement—which typically begins with a phrase such as “The purpose of this study is,” “This study intends to,” or “The objective of this study is.” This statement will help you understand what the study is trying to accomplish.

With these tips in mind, carefully read the quantitative physical-activity-in-middle-schools study by Xu et al. (2010) starting on p. 27 and the qualitative physical-activity-at-daycare study by Tucker et al. (2011) starting on p. 40. First, write a complete, APA-style reference for each article.

As you read each article, pay attention to the major sections that the authors used to organize the information. Use the highlighting tool in the Pearson etext to indicate where each major section begins within the article, and use the notetaking tool to add marginal notes that name each section you highlighted and note what information it presents about the study's research process. Among the sections you will want to find are:

1. Front matter
2. Introduction section
3. Method section
4. Results section
5. Conclusion section
6. Back matter

Note that sometimes authors will use two or more headings within one major section of their report—for example, they may introduce their study with the two headings of *Introduction* and *Literature Review*. If two or more headings in the article contribute to one of the major sections, indicate that in your marginal notes.



**Click here to go to the quantitative physical-activity-in-middle-schools study by Xu et al. (2010) so that you can write a complete APA-style reference for the article and identify the major sections of the article.**



**Click here to go to the qualitative physical-activity-at-daycare study by Tucker et al. (2011) so that you can write a complete APA-style reference for the article and identify the major sections of the article.**

## Understanding Research Articles

Apply your knowledge of the content of this chapter to the quantitative physical-activity-in-middle-schools study by Xu et al. (2010) starting on p. 27 and the qualitative physical-activity-at-daycare study by Tucker et al. (2011) starting on p. 40.

1. Use the rating scale in Figure 1.1 to determine whether the quantitative physical-activity-in-middle-schools article reports a research study. What is your evidence that the article is a research study?
2. Here is a list of the major headings that appear in the physical-activity-in-middle-schools article. Which steps of the research process do you expect to find in each section?
  - Introduction
  - Methods
  - Results
  - Discussion
  - Conclusion and recommendations
3. Use the rating scale in Figure 1.1 to determine whether the qualitative physical-activity-at-daycare article reports a research study. What is your evidence that the article is a research study?
4. Here is a list of the major headings that appear in the physical-activity-at-daycare article. Which steps of the research process do you expect to find in each section?
  - Introduction
  - Methods
  - Results
  - Discussion
  - Future directions
  - Conclusion
5. Assume that you are a professional (such as an educator, administrator, nurse, or counselor) who is interested in learning about children's physical activity. Why might it be important for you to read these two research studies?
6. Think about your own professional and educational interests. Write a paragraph that describes the kinds of information that you would like to learn by reading research and the reasons why it might be useful for you to read research.

✓ **Click here to answer the questions and receive instant feedback.**

# An Example of Quantitative Research: The Physical-Activity-in-Middle-Schools Study

Let's examine a published research study to apply the ideas we are learning. Throughout this book, we will refer to this study as the "quantitative physical-activity-in-middle-schools" study. This journal article reports a research study conducted and reported by Xu et al. (2010). Their study is about the opportunities for physical activity that are available for children attending middle schools. The article begins by describing the importance of physical activity and promoting physical activity in schools. The researchers decide to conduct a study to learn about the opportunities available in middle schools, along with the various factors that predict the different levels of opportunities available in schools. The researchers conduct their study by collecting data from a large number of middle school physical education teachers. They analyze the gathered data to determine the prevalence of physical activity opportunities and the factors that are related to the level of opportunities at schools. They conclude their study by interpreting the different factors that they found to be associated with physical activity opportunities.

As you read this article, pay careful attention to the marginal annotations that signal the major characteristics of quantitative research, which will be discussed in Chapter 2.



[Click here to write a complete APA-style reference for this article and receive instant feedback.](#)



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The front matter identifies the title of the article.

# Association between social and environmental factors and physical activity opportunities in middle schools

The front matter includes information about the journal and this specific article.

The front matter identifies the article authors.

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The front matter includes a brief abstract that summarizes the content of the article.

## Abstract

School-based physical activity (PA) interventions impact children's PA involvement and thus opportunities and associated factors for the promotion of physical activity in children need to be examined. The purpose of this study was to examine physical education teachers' perceptions of PA opportunities available to students at the middle school level and indicate associated factors that might influence these opportunities. A questionnaire survey was administered to 292 public middle school teachers in 181 schools located in the southeastern region of the United States. The results of the study indicate the need for more PA opportunities for middle school children in order for them meeting the recommended daily PA involvement of 60 minutes. In addition, there were statistically significant associations between PA opportunities and facilities availability, school location, and family support, indicating that some social and environmental factors tend to impact students' PA opportunities.

## Keywords

middle school, physical activity opportunity, physical education teacher, social and environmental factors

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## Introduction

- (01) Low levels of physical activity (PA) are a major contributor to current overweight and obesity problems in children and adolescent (Fairclough and Stratton, 2005; Lobstein et al., 2004). Even though Centers for Disease Control and Prevention (CDC, 2010) recommends 60 minutes of daily PA for children and adolescents, there only 8 percent of children and adolescent meet the recommendation (Troiano et al., 2008). The issue becomes more serious with the prediction that obese or overweight children and adolescents are expected to maintain their childhood or adolescent physiques as adults (Anderson and Butcher, 2006; USDHHS, 2001). Obesity is associated with chronic diseases such as heart disease, type 2 diabetes, stroke, some forms of cancer, and osteoarthritis, premature death or discounted quality of life (USDHHS, 2001), and high healthcare costs (Wang et al., 2003). There is clearly a need to reduce the impact of this problem and the school setting appears as a viable intervention venue to promote PA involvement, e.g. tailor an effective exercise intervention program (Edmunds et al., 2001; Wechsler and Devereaux, 2001).
- (02) School is considered to be an ideal early intervention institution for PA promotion because it can reach most children and adolescents and has a strong potential effect on children's and adolescents' behaviours (Edmunds et al., 2001; Wechsler and Devereaux, 2001). However, successful school-based PA intervention at the middle school level, grades 6–8, has seldom been reported in comparison to those targeting elementary schoolchildren (Sallis et al., 2002). Middle school years are recognized to be an important time in the development of adolescents' knowledge, attitudes, beliefs, and behaviours as related to physical activity participation (Malina, 1996; Mohnsen, 2008; Sallis and Patrick, 1994), and this developmental period may impact their PA behaviours far beyond middle school years (Malina, 1996). School-based PA intervention tailored for middle school age children and adolescents therefore might be essential for PA promotion. A two-year school-based PA intervention ( $n = 1295$ ) was piloted in an effort to reach middle school age children and adolescents but this intervention was found not effective in PA behaviours nor in changing body fat in boys (Gortmaker et al., 1999). There was another attempt to pilot school-based PA intervention, which was designed to increase the aerobic component of the school's PA program and educate children about weight control and blood pressure (McMurray et al., 2002). However, 'best practices' were difficult to determine due to the effect being small and body mass index (BMI) not changing significantly (McMurray et al., 2002). One school-based PA program was shown to be feasible in promoting PA (Sallis et al., 2002). It used a randomized, controlled, school-based trial of 26,616 middle school students in 48 middle schools over two years. It evaluated the effect of school policy and environment on student eating and PA behaviours. The approach was found to be effective in increasing PA but no changes in food choices behaviours were discovered (Sallis et al., 2002). These prior studies provided useful guidance; however, there has been no 'best practice' to promote PA in middle school age children and adolescents. Therefore, it seems that, in order to identify effective intervention strategies for this specific population, there is a need to further examine and better understand available school-based PA opportunities and factors that may influence these PA opportunities because it could be thought of as a key in promoting PA among middle school age children and adolescents.
- (03) Accordingly, the present study was designed to explore school-based PA opportunities in public middle schools and to examine factors that may be associated with these opportunities from physical education (PE) teachers' perspectives. This study was grounded in the Social Ecological Model – a theory that deals with how multiple facets of physical and social environments may influence behaviours of middle school students (Stokols, 1996). With the use of the social

The literature is used to prescribe the direction of the study in quantitative research

The research problem calls for explanation in quantitative research

The purpose statement and research questions are narrow and specific in quantitative research. The intent is to describe trends, relationships, or differences for variables

ecological approach, it will be possible for professionals in public health and PE to extend traditional motivational and behavioral theory by examining correlates of social and environmental factors that influence students' PA opportunities and, as a result, provide better understanding how to promote PA in middle school students. Specific aims of this study were to investigate the status of PA opportunities afforded to public middle school students, and to examine interactions between existing factors and PA opportunities in the middle school setting.

## Methods

### Study design

- (04) This study was conducted following a quantitative study design. A cross-sectional online survey was used to research PA opportunities afforded to students in middle school and to identify factors related to students' PA opportunities. Use of online survey to reduce the data collection time and cost was deemed justified because all of the potential respondents had access to the internet and there had been virtually no differences among schools in access to the internet (National Center for Education Statistics, 2006).

The researcher chooses an experimental or non-experimental research design in quantitative research.

### Participants

- (05) Potential study respondents were the 660 middle school PE teachers from the 421 middle schools located in the southeastern region of the United States. Of the 660 potential participants, 292 from 181 public middle schools responded to the online survey, resulting in a response rate of 44 percent, which was comparable to the average response rate of 37 percent among other published online surveys (Sheehan, 2001). Of the 292 respondents, 243 provided valid responses for this study. On average, there were 1.34 PE teachers per school responding to this survey from a total of 181 schools in 75 different counties. There was an equal representation of female ( $n = 123$ ) and male ( $n = 120$ ) respondents, they ranged in age from 22 to 60, had between 1 and 35 years of work experience as PE teachers, and 93 percent of them had a university degree with specialization in PE. Overall, the sample represented a group of experienced respondents who were able to provide credible information.

The researcher selects a large number of participants that are representative of a group in quantitative research.

### Procedure

- (06) Following approval by the University Institutional Review Board, data from participants were gathered between 20 August and 24 November 2006. The study involved two phases. In the initial phase, a piloted study was conducted to test the level of internal consistency reliability (Cronbach's alpha of 0.78) and appropriateness of the instrument, which was adapted and modified from a previous study (Barnett et al., 2006). Based on the feedback from the pilot study, the final version of questionnaire was generated including 53 questions that took approximately 30 minutes to complete. In the second phase, a convenience sample of 660 middle school PE teachers' email addresses was obtained from 421 middle schools' websites or through phone calls. A promotion email with a web link to the password-protected online survey and a generic cover letter that informed respondents about the purpose of the study, filling instructions, and privacy concerns was delivered to those email addresses. The website remained accessible for data collection for a full two months during which four reminder emails were issued to those people who had not yet responded to our survey. A prize draw after the conclusion of data collection was used as an incentive to stimulate the response rate; in total 43 prizes were given out in the form of gift cards (two \$100, six \$50, fifteen \$20, and twenty \$10 gift cards).

### Instrumentation

The researcher gathers numeric data using instruments in quantitative research.

- (07) The survey instrument used in this study was modified from the questionnaire instrument that Barnett and colleagues (2006) used to determine the PA opportunities and its association with social and environmental factors in elementary schools in Canada (Barnett et al., 2006). Permission was obtained from authors to use the questionnaire for this study and to modify some items to make the questionnaire appropriate for the target population in this study. The final version of the questionnaire contained 53 questions seeking for available PA opportunities and social environmental factors that were considered potential correlates of available PA opportunities and were consistent with the social ecological model for the study. Number of PA opportunities was calculated from questions about a frequency and duration of specific schools' PE, extra-curricular PA and participation rate, and number of special PA events that school organized per year, e.g. field trips, jump rope for heart. Social and environmental factors were assessed from school policy related to PE, physical environment, cost of human resources, availability of the transportation for after-school programs, family support, and PE teachers' personal beliefs about the benefits of PA in general and PA benefits specifically for their students (Table 1) (Barnett et al., 2006). All of the questions relating to social and environmental factors were written as statements and could be answered on a four-point scale with a minimum and a maximum score of 1 and 4 respectively. Demographic inventory was used to collect the participants' information regarding gender, age, total years of teaching, current assignment, and location of school (urban, suburban, or rural).

### Data analysis

The researcher uses statistical analyses to describe trends, relate variables, and compare groups in quantitative research.

- (08) The SPSS Version 13.0 for Windows software package and SAS Version 9.1 were used for statistical analysis. Descriptive statistical analysis was conducted to describe the characteristics of participants such as gender, age, degree, years of teaching experience, and to provide information about available PA opportunities, and school demographics. Exploratory factor analysis was used to reduce 40 originally conceived social and physical environment categories to fewer dimensions for further analysis. Principal component analysis with Varimax rotation and Kaiser Normalization was used in this analysis. The selection of each factor was based on the rotated component matrix greater than 0.50 and less than -0.50 (Darlington, 2002). Labels were allocated according to the most significant items associated with the components with reference to Barnett et al. (2006). Further, ordinal logistic regression model was used in this data analysis for prediction of PA opportunities (dependent variables) in school by using social and environmental factors (independent variables) as Barnett and colleagues (2006) suggested that social and environmental factors were essentials determinants of PA opportunities in school (a number of special physical activity events, hours of extracurricular PA offered per week, and duration of PE class). The odds ratio (OR) was used as the primary measure of strength and direction of the relationship between each independent variable and the PA opportunities that were categorized to levels (4, 3, 2, 1) with quartile range. In this analysis, odds ratios less than 1 indicated a negative relationship.
- (09) Following these analyses, multiple ordinal logistic regression analysis was run among the independent variables and dependent variables. The overall test running a full model included all variables that were highly significant with  $p$  values less than 0.05, which were independent variables effectively predicting PE teachers' perception of PA opportunities.

**Table 1.** Questionnaire overview

---

PA Opportunities	
1.	Type of physical education class schedule
2.	Number of physical education classes per week
3.	The duration (length) of physical education class
4.	Average physical education class size
5.	Types of extracurricular PA organized for students
6.	Hours of extracurricular PA organized each week for students
7.	Number of students participated in extracurricular PA weekly
8.	Events organized for students each year
Social and Environmental Factors	
1.	School policies
a.	School board policy for physical education, extracurricular PA
b.	Time spent on health issues in physical education class
c.	Frequency of student exemptions from physical education class
d.	Academic load
2.	PA limited by cost and resources
3.	Family support
a.	Parents involvement in school activities
b.	Family interest in school activities
4.	School staff support
a.	Physical education teacher involvement in school PA
b.	School has physical education supervisor/coordinator
5.	Role modeling of PA
a.	Physical education teacher activity level
6.	Physical environment
a.	Sports equipment
b.	Sports facilities
c.	Availability of space for storing specific student equipment
7.	Organizational environment
a.	Total number of students in the school
b.	Proportion of students bussed to school
c.	Transport and scheduling
8.	Sociocultural environment
a.	School location (urban, suburban and rural)
9.	Physical education teacher' beliefs
a.	Benefits of PA to student
b.	Benefits of PA in general
c.	Importance of selected lifestyle factors to maintain good health
10.	Physical education teacher' characteristics: age, gender, teaching experience

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Source: Barnett et al., 2006: 219.

## Results

### *PE Teachers' Perceptions of Physical Activity Opportunities*

- (10) Three main PA opportunities on middle school campus were categorized as: PE, extracurricular PA, and special events. As presented in Table 2, the average amount of time allocated to a PE class was 185 minutes per week (range 0–450). With regards to special events, the average for schools

**Table 2.** School-based physical activity (PA) opportunities in middle school

PA opportunities	Median	Mean	SD	Range
PE class (minutes per week)	195	185	98.6	0-450
Extracurricular PA (minutes per week)	346	347	224	0-1200
Number of special PA events per year	7	6.3	2.3	0-10
Participation in extracurricular PA per week (numbers of students per week)	40	50	49	0-200
Overall PA opportunities except annual PA events and extracurricular PA (minutes per day)	39	37	19.7	0-90

**Table 3.** School demographic data ( $n = 181$ )

School physical education	Frequency	%
Schools provides PE	170	94
PE class size 30 or larger	127	70
Maximum allowable teacher to students ratio	134	74
Policy for exempting student from class	16	9
Follow National Association for PE standard	65	35.9
Adaptive PE material and equipment	41	22.6

was 6.3 special events per year. The average length of the extracurricular PA time offered by individual schools was 347 minutes per week, but the average participation rate in each school was 50 students per week, which was low given the mean enrolled number of 911 students per school. Therefore, taking into account the reported participation in extracurricular PA, duration of PE class and average school enrollment, the average time offered by those schools for daily physical opportunities was 37 minutes.

- (11) Furthermore, as shown in Table 3, PE was rather available across the surveyed schools as 94 percent of them ( $n = 181$ ) offer PE more than once a week, but this positive fact is counter-balanced by a large class size, given that 70 percent of classes were between 30 and 39. Furthermore, 74 percent did not have maximum allowable teacher student ratio of 1:30 required for PE teaching (NASPE, 2006). Nine percent of schools had a policy for exempting some students from enrolling in PE class; for example, student athletes were exempt from taking PE classes. With respect to curriculum materials, only 35.9 percent of schools followed the National Association for Sport and Physical Education (NASPE) standards in their school PE class. NASPE standards is a guide for K-12 grade level in the United States including key points of emphasis on specific content area (e.g. performance-related fitness), benchmarks of performance for each grade level, and appropriate assessment techniques for achievement in each specified content area (NASPE, 2006). In addition, only 22.6 percent of schools had adaptive PE material and exercise equipment that could be used by student with disabilities (e.g. adjustable basketball hoops, foam-rubber scooters for students with special needs), and 56 percent of schools had a PE supervisor/coordinator.

The researcher reports results about participants' characteristics, the instruments' performance, and the study's research questions in quantitative research.

### *The relationship between physical activity opportunities and associated factors*

- (12) As discussed in data analysis, factor analysis was used to synthesize and reduce questionnaire items into scales that measured PE teachers' perceptions of social and environmental factors that

**Table 4.** Scales resulting from exploratory factor analysis ( $n = 40$ )

Scale	No. of items	Reliability (Coefficient alpha)
Teachers' belief on PA benefits in general (PABG)	7	.891
Physical environment (PE)	6	.829
School policies (SP)	4	.808
Students' family support (FS)	4	.790
Teachers' beliefs on PA benefits to students (PABS)	3	.894
Cost of human resource (CHR)	3	.737
Organizational environment (OE)	2	.700

Loading items with reliability coefficients below the cutoff value for social science research ( $\alpha = 0.70$ ) were deleted (Nunnally, 1978)

**Table 5.** Unadjusted odds ratios (OR) and 95% confidence intervals (CI) for potential correlates of physical activity opportunity and associated factors

Potential Correlate	HPA			DPEC			NSE		
	OR	95% CI	P	OR	95% CI	P	OR	95% CI	P
PABG	1.55	1.03-2.32*	0.034	1.51	1.01-2.25*	0.045	0.90	0.60-1.34	0.605
Physical Environment	1.78	0.50-1.11	0.436	1.97	1.71-2.32	0.048*	0.92	0.67-1.02	0.300
School policies	1.11	0.83-1.48	0.484	0.96	0.72-1.28	0.766	0.78	0.59-1.05	0.104
Family support	1.81	1.22-2.69*	0.003	1.33	0.90-1.95	0.152	1.09	0.74-1.60	0.658
PABS	1.24	0.81-1.89	0.318	0.69	0.45-1.06	0.090	0.80	0.53-1.22	0.301
CHR	1.39	1.10-1.71*	0.003	1.08	0.82-1.43	0.591	0.81	0.61-1.07	0.141
OE	1.40	1.12-1.74*	0.003	1.09	0.88-1.35	0.421	0.85	0.68-1.06	0.140

HPA = hours of extracurricular PA; DPEC = duration of PE class; NSE = no. of special events; PABG = teachers' belief on PA benefits; PABS = teachers' beliefs on PA benefits to students; CHR = cost and human resources; OE = organization environment

were used in further analysis; the factor-loading matrix is given in Table 4, and explains 62 percent of the variation in social and environmental questions. Loading items with reliability coefficients below the cutoff value for social science research ( $\alpha = 0.70$ ) were deleted (Nunnally, 1978). Then, ordinal logistic regression models were used to evaluate the relationships between social and environmental factors loaded through factor analysis and PA opportunities. Results from univariate (unadjusting) and multivariable (adjusting) ordinal regression models are shown in Tables 5, 6, and 7.

- (13) The unadjusting ordinal logistic analysis (the univariate analysis) results, shown in Tables 5 and Table 6, depicted teachers' personal beliefs about the benefits of PA in general (OR = 1.55, 95 percent CI: 1.03–2.32), physical environment (OR = 1.97, 95 percent CI: 1.71–2.32), family support (OR = 1.81, 95 percent CI: 1.22–2.69), cost and human resource (OR = 1.39, 95 percent CI: 1.10–1.71), and organizational environment (OR = 1.40, 95 percent CI: 1.12–1.74). Those factors were significantly associated with students' PA opportunities in school (Table 5). As expected, school location (OR = 1.59, 95 percent CI: 1.20–3.12), teaching experience (OR = 1.03, 95 percent CI: 1.00–1.06) and teacher's educational degree (OR = 2.70, 95 percent CI: 1.02–7.14) were also significantly correlated with students' PA opportunities (Table 6). However, PE

**Table 6.** Unadjusted odds ratios (OR) and 95% confidence intervals (CI) for potential correlates of physical activity opportunity and school locations and respondent characteristics

Potential correlate	HPA			DPEC			NSE		
	OR	95% CI	P	OR	95% CI	P	OR	95% CI	P
Suburban	0.93	0.48-1.81	0.827	1.59	1.20-3.12	0.042*	1.12	0.57-2.19	0.745
Gender	0.94	0.60-1.48	0.792	0.90	0.57-1.42	0.652	1.10	0.70-1.73	0.681
Age	1.00	0.98-1.03	0.885	1.01	0.98-1.03	0.700	0.99	0.96-1.01	0.258
Teachers' teaching experience	1.00	0.98-1.03	0.887	0.99	0.97-1.02	0.672	1.03	1.00-1.06*	0.028
Degree	1.08	0.42-2.78	0.870	0.48	0.19-1.25	0.134	2.70	1.02-7.14*	0.045

HPA = hours of extracurricular PA; DPEC = duration of PE class; NSE = no. of special events.

**Table 7.** Adjusted odd ratios (OR) and 95% confidence intervals (CI) for independent correlates of physical activity opportunity in middle school

Correlate	HPA			DPEC			NSE		
	OR	95% CI	P	OR	95% CI	P	OR	95% CI	P
Family support	1.55	1.02-2.35*	0.003						
Facilities				1.43	1.02-1.99*	0.036			
Suburban				0.80	0.68-0.94*	0.007			
School policies							1.16	1.05-1.28*	0.003

HPA = hours of extracurricular PA; DPEC = duration of PE class; NSE = no. of special events.

teachers' gender and age were not correlated with students' PA opportunities. Multivariable analysis showed that family support (OR = 1.55, 95 percent CI: 1.02-2.35), school policies (OR = 1.16, 95 percent CI: 1.05-1.28), facilities (OR = 1.43, 95 percent CI: 1.02-1.99) and suburban location of the school (OR = 0.80, 95 percent CI: 0.68-0.94) were independent predictors of the availability of PA opportunities after adjusting for the effects of the other factors (covariates) (Table 7).

## Discussion

Social and environmental factors are important determinants of children's and adolescents' PA opportunities and they will eventually influence their PA behaviours (Sallis et al., 1998, 2002). Thus, it is important to target middle school level in order to promote PA for future healthy behavior. However, research is lacking with regards to examining the social and environmental factors' relationship with PA opportunities in middle school campus and studies with focus on PA opportunities are limited as well. Existing documented studies only focused on some PA opportunities, such as leisure-time (McKenzie et al., 2000), or extracurricular PA (Powers et al., 2002), or without combining data to determine opportunities at the school level (Tompkins et al., 2004). Our results extend existing knowledge by identifying school-based PA opportunities and factors associated with these opportunities at the middle school level.

### *PE teachers' perceptions of physical activity opportunities in middle school*

- (15) With regard to PA opportunities in school, our findings clearly indicated that PE continues to be an issue in middle schools. Time allocated for PE varied considerably from school to school, but the average time allocated was 185 minutes per week, which is far below the recommended 225 minutes (NASPE, 2006). Further, approximately 40 percent of schools in our study did not reach the recommended time and it is likely that the actual PE time students received weekly was even lower for the schools on block scheduling. With typical block scheduling in the United States, a PE class meets for 85–120 minutes a day, but only for 90 days a year instead of traditional 40 minutes a day and 180 days a year (Claxton and Bryant, 1996). This means, if a school was on block scheduling, the average weekly PE time counted was actually lower as students will not have PE for another half year. The result is in line with other studies reporting the erosion of the PE requirement in school (Burgeson et al., 2001; School Health Policies and Programs Study, 2000; Tompkins et al., 2004). In addition to PE, results obtained from this study also confirm findings of Powers et al. (2002) that students' lower participation rate in extracurricular physical activity is a considerable concern, given that on average only 50 students participated per school with the mean enrollment of 911 students per school.

The researcher compares results to predictions and past studies in quantitative research.

### *(16) Association between factors and physical activity opportunities*

Collectively, this cross-sectional study suggests that family support, facilities, school policies, and location have multivariate association with students' PA opportunities in school. Considering the factors impacting PE-related PA opportunities, our study revealed that large class size, facilities and school location were univariately associated with students' PA opportunities in PE. These results support the argument that large class size and limited facilities inhibit student potential PA opportunity in PE (Burgeson et al., 2001; Darst and Pangrazi, 2006; Hastie and Saunder, 1991; McKenzie et al., 2000; Young et al., 2007). However, after controlling social and physical environmental variables, only facilities and school location were multivariately associated with students' PA opportunity in PE. It might be that the actual need for facilities is directly linked to quality of PE and that an enriched environment increases students' PA opportunities (Mohsen, 2008). Suburban schools tend to have better facilities (Wang et al., 2003) and thus offer more PA opportunities. It is encouraging to see that improvement of middle school facilities might potentially increase students' PA opportunity in PE. Some inner-city middle schools suffer from limited space, i.e. no or very small school yard, and overcrowding happens as a consequence of this space limitation during recess/lunch break. Thus, it is really challenging for students to use those opportunities to participate in informal PA. Enhanced availability of facilities is likely to be particularly important in schools with a large portion of economically disadvantaged students because PE class might be the only PA opportunity available to them during the day.

- (17) With regards to the factors associated with students' extracurricular PA opportunities in middle school, our results suggest PE teachers' personal beliefs, family support, cost of human resources, and organizational environment are such factors. However, only family support remained significantly associated with students' extracurricular PA opportunity after controlling for social and physical environmental variables. Parental encouragement and support influence their children's PA involvement (Sallis et al., 2000). Furthermore, the results suggest that overall differences in transportation among different middle schools do not seem to have a strong impact on students'

extracurricular PA opportunities. However, the data of transportation obtained in this study might have been underestimated due to self-reporting.

### Limitations of study

The researcher interprets the limitations and implications of the results in quantitative research.

- (18) There are limitations associated with the study. First, the participants in this study were conveniently selected from easily available sources such as school websites and emails and the schools were located in the southeastern region of United States, which might decrease the extent to which the results could be generalized to all middle schools in United States. Secondly, the measures (e.g. PA opportunities) were based on perception of PE teachers, thus exposing questions related to respondents' subjectivity. Lastly, the questionnaire did not assess students' PA participation; the absence of these data hinders our understanding of the association between PA opportunities and student PA participation. To minimize the limitations of this study, future research should attempt to replicate these findings using a randomly selected nationwide sample. Furthermore, researchers should continue to refine survey instrument and other data collection methods to be used in this line of research. Objective measures of PA opportunities and student PA participation on campus are necessary to strengthen the association between PA opportunities and students' level of PA.

### Conclusion and recommendations

- (19) Examining the association between factors and students' PA opportunities in middle school provided complementary information, which helped to identify modifiable factors and provide direction for future school-based intervention programs. Those modifiable factors such as supportive school policies, better facilities, and family support do influence availability of PA opportunities, which in turn influence students' PA behaviour choices, in line with the Social Ecological Model, and thus help to promote PA at middle school.
- (20) While this study added new information to the current knowledge, there is a need for further research at the middle school level. The factors that are correlated with students' PA opportunities should be subjected to a detailed study. Intervention programs should be developed to target modifiable factors identified in this study and PA opportunities offered in different schools ought to be further examined to more accurately assess associations. Recommendations for future research include testing the extent to which PA opportunities are proportional to the quality and quantity of children's and adolescents' PA involvement. Other research studies that can be conducted could concern educational interventions aimed at discovering effective educational components that promote children's and adolescents' involvement in PA. With collective and continuous efforts, children and adolescents can take advantage of different PA opportunities in school, which in the long run will help them to shape up and maintain a healthy lifestyle.

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The back matter includes a list of references and information about the authors.

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## An Example of Qualitative Research: The Physical-Activity-at-Daycare Study

Let's examine another published research study to apply the ideas we are learning. Throughout this book, we will refer to this study as the "qualitative physical-activity-at-daycare" study. This journal article reports a research study conducted and reported by Tucker et al. (2011). Their study is about children's physical activity while attending daycare. The article begins by describing the importance of physical activity for young children and the need for physical activity in daycares. The researchers decide to conduct a study to learn about children's physical activity at daycare and how it might be improved. They conduct their study by collecting data from a small number of groups of daycare providers. The researchers analyze the data to describe the perspectives that providers hold about physical activity for children at daycare. They conclude by interpreting the meaning of the participants' perspectives and experiences about physical activity in daycare.

As you read this article, pay careful attention to the marginal annotations that signal the major characteristics of qualitative research, which will be discussed in Chapter 2.



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Article

The front matter identifies the title of the article.

## Physical activity at daycare: Childcare providers' perspectives for improvements

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The front matter includes a brief abstract that summarizes the content of the article.

### Abstract

In London, Ontario, approximately 45 percent of preschoolers are insufficiently active. With the large number of preschoolers who attend childcare (54%), and the low levels of physical activity among preschool-aged children, daycare centers may be an appropriate avenue to intervene. This study sought to collect childcare providers' suggestions for improving physical activity during daycare hours and their perspectives regarding the feasibility of meeting the physical activity guidelines currently set out for preschoolers. This qualitative study targeted a heterogeneous sample of childcare providers (n = 54) working at YMCA daycare centers in London, Ontario. Eight focus groups were conducted. Saturation was reached by the fifth focus group; however, three additional focus groups were completed to confirm that the researchers continued hearing the same responses. Focus groups were audio-recorded and transcribed verbatim. Inductive content analysis was used to code and categorize emerging themes. Strategies were incorporated to ensure data trustworthiness. Childcare providers believed the children in their care were quite active and when asked what would be required to increase the physical activity participation among the preschoolers in their care, participants discussed: staff training/workshops; guest physical activity instructors; additional equipment and resources; and increased funds for physical activity. The majority of focus group participants also felt it was feasible for the preschoolers in their care to meet or exceed the preschooler physical activity guidelines. Developing programs and resources that are informed by childcare providers may be an effective way to target sedentary behaviors among the preschool-aged population. Accordingly, childcare providers' suggestions of how to maximize the opportunities for physical activity during daycare hours should be considered when developing and revising childcare curriculum, resources and policies.

### Keywords

childcare, physical activity, physical activity guidelines, preschoolers, staff training

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## Introduction

- (01) The rate of childhood obesity among young children is disturbing. In Canada, researchers have found that between 26 percent and 30 percent of preschool-aged children (aged 2.5–5 years) are overweight or obese (Canning et al., 2004). High incidences of childhood overweight and obesity are also present worldwide. For example, 25 percent of American preschool-aged children have a body mass index greater than the 85th percentile for their age and sex (Ogden et al., 2006). The high rate of childhood obesity is concerning as obesity has been linked to type-2 diabetes, hypertension, hyperlipidemia, sleep apnea, and psychological issues (Daniels, 2006). Moreover, individuals who are overweight during childhood are more likely to be obese during adulthood (Whitaker et al., 1997). Clearly, obesity prevention efforts are necessary during early childhood, especially because the preschool years have been identified as a critical time for growth, development, and impacting one's risk of being obese later in life (Dietz, 1997, 2000; Whitaker et al., 1998).
- (02) Physical activity, which can be defined as 'any bodily movement resulting in energy expenditure' (Sirard and Pate, 2001) has been identified as a key behavior for preventing obesity (Prentice and Jebb, 1995); yet, a recent systematic review identified that approximately 45 percent of preschool children remain insufficiently active to gain health benefits (Tucker, 2008). While many parents and teachers believe that young children are very active throughout the day, some recent studies have identified that preschool-aged children are not as active as adults perceive them to be (Fisher et al., 2005; Pate et al., 2004, 2008; Reilly et al., 2004). This misconception is cause for concern considering the high occurrence of childhood obesity in Canada and internationally. It seems Tucker's finding may be a conservative estimate of physical inactivity levels among preschoolers (Tucker, 2008), as Pate and colleagues recently noted that moderate to vigorous physical activity (MVPA) was only observed during 3.4 percent of the preschool day, translating into one hour of MVPA in a 30-hour week of daycare supervision (Pate et al., 2008). This finding is well below the National Association for Sport and Physical Education (NASPE) physical activity guidelines which suggests that preschoolers should engage in 60 minutes of structured and at least 60 minutes (and up to several hours) of unstructured physical activity per day (National Association for Sport and Physical Education, 2002).
- (03) The very low rates of physical activity documented among preschool-aged children are disconcerting. Furthermore, researchers have consistently identified that girls are significantly less active than boys (Finn et al., 2002; Grontved et al., 2009; Hinkley et al., 2008; Pfeiffer et al., 2009; Tucker, 2008). Specifically, Grontved et al. reported recently that in a seven-hour preschool day, male preschoolers engaged in approximately 18 more minutes of MVPA than their female counterparts (Grontved et al., 2009). Clearly, interventions to increase physical activity among preschoolers, with a particular emphasis on female children, are necessary.
- (04) Fifty-four percent of Canadian children attend daycare (Bushnik, 2006). There are approximately 867,194 spaces in regulated childcare centers across the country, 65 percent of which are for those children not yet enrolled in school (Childcare Resource and Research Unit, 2008). In Ontario, nearly 20 percent of children aged zero to five years attend regulated childcare, and this does not capture the children who are cared for at unregulated centers (Childcare Resource and Research Unit, 2008). On average, these children spend roughly 27.5 hours each week at childcare (Bushnik, 2006). Given the large number of Canadian preschoolers who attend childcare and the significant number of hours these children spend in non-parental care every week, childcare facilities may be an appropriate place to intervene to support physical activity among a large number of preschoolers. Moreover, parents of preschoolers have reported that they rely on the daycare facility to ensure that their children engage in sufficient physical activity (Tucker et al.,

The literature is used to inform the direction of the study in qualitative research

2006). Despite this, the daycare environment has been largely overlooked in the discussion of avenues for preventing childhood obesity (Kaphingst and Story, 2009). In fact, little research exists on physical activity programs in childcare facilities (Chau, 2007) and the need to identify strategies to improve physical activity opportunities for preschool-aged children in these settings has been highlighted (Riethmuller et al., 2009). The childcare setting offers a unique opportunity to facilitate healthy active lifestyles among our youngest members of the population. In fact, the childcare center itself has been identified as a stronger predictor of physical activity than any demographic factor, such as race, gender, or age (Pate et al., 2008); it has been noted to account for between 43 percent and 50 percent of the variation in physical activity levels among preschoolers attending daycare (Finn et al., 2002; Pate et al., 2004). Interestingly, daycare staff themselves have acknowledged the critical role they play in the prevention of childhood overweight (Pagnini et al., 2007). Specifically, daycare staff believed they should encourage healthy food habits and active play at childcare in service of building a foundation for developing healthy and active behaviors that can be continued later in life (Pagnini et al., 2007). Therefore, it is important that daycare facilities offer the appropriate conditions and resources (e.g., space, time, and equipment) for young children to be active. Before interventions aimed at improving physical activity levels of children in daycare can be developed, it is important to understand the current physical activity practices occurring in daycares. Also, because daycare providers are the ones who work with groups of preschoolers on a regular basis, and can be argued to have a unique vantage point about what would work best for increasing their physical activity, childcare providers' suggestions for improving physical activity practices need to be collected. Therefore, the primary purpose of this study was two-fold: 1) to gain insight into the current physical activity levels of preschoolers, with regard to the feasibility of meeting the NASPE physical activity guidelines; and 2) to identify daycare providers' suggestions for improving these preschooler's physical activity levels. Specifically, daycare providers were asked to identify the supports they need to better engage preschoolers in active behaviors during daycare. This study was part of a larger study which sought to identify childcare providers' perspectives of: the barriers and facilitators to physical activity at daycare; current physical activity curriculum, resources and policies; as well as their suggestions for improving physical activity among preschoolers who attend daycare. Please see van Zandvoort et al. (2010) for additional findings.

The research problem calls for exploration in qualitative research

The purpose statement and research questions are broad and general in qualitative research. The intent is to explore a central phenomenon.

## Methods

- (05) Eight semi-structured focus groups were conducted with childcare providers (mean age = 32 years; mean years of experience = 8 years; 100% female) from London, Ontario YMCA daycare centers (mean attendance at daycares = 76 children/facility; for a full description of the study participants, please refer to Table 1). Nine daycare directors, of a possible 17, agreed to participate in the current study. In total, 54 childcare providers (of a possible 116 providers across the 17 YMCA locations) that provide services to a diverse (e.g., in terms of ethnicity, socio-economic status) group of preschoolers participated in one of eight focus groups, for a response rate of 47 percent. Each focus group had between six and eight participants. Participants also completed a short questionnaire to report the quality and availability of the space and infrastructure at the daycare facilities, as well as demographic information. Ethical approval was obtained from the University of Western Ontario Research Ethics Board and the Research Advisory Committee at the Middlesex-London Health Unit.

The researcher chooses a qualitative approach in response to the study's exploratory purpose.

The researcher intentionally selects a small number of participants in qualitative research.

All focus groups took place at YMCA daycare centers and lasted between 1.0 and 1.5 hours.

- (06) Seven focus groups were conducted in the evening when the daycares were closed, and one focus

**Table 1.** Demographic information ( $n = 54$ )

	N	%
<b>Gender</b>		
Male	0	0
Female	54	100
<b>Age</b>		
≤ 25 years	15	29.4
26–29 years	9	17.6
30–34 years	8	15.7
35–39 years	8	15.7
40–44 years	3	6.0
45 + years	8	15.8
<b>Ethnicity</b>		
White	46	85.2
Latin American	1	1.9
Asian	1	1.9
Arab	2	3.7
Other	3	5.6
<b>Education</b>		
High school	2	3.7
College	45	83.3
University	6	11.1
Graduate school	1	1.9
<b>Employment status</b>		
Full-time	47	87.0
Part-time	7	13.0
<b>Years of experience</b>		
< 5 years	23	43.4
5–9 years	13	24.5
10–14 years	7	13.2
15–19 years	5	9.5
20+ years	5	9.5

The researcher gathers text and image data in qualitative research.

group was completed during daycare hours. An experienced moderator and assistant moderator facilitated all focus group meetings. Saturation, or the retrieval of no new information, was reached by the fifth focus group; however, an additional three focus groups were conducted to confirm that the researchers continued to hear the same responses.

(07)

The researcher uses thematic analysis to develop description and themes in qualitative research.

All focus groups were audio-recorded and transcribed verbatim. Strategies, as outlined by Guba and Lincoln, were utilized to ensure the trustworthiness of the focus group findings (Guba and Lincoln, 1989). For example, member-checking was conducted between each question and at the end of each focus group to ensure that the moderator correctly understood the participants' responses and to confirm the assistant moderator's identification of the main points. After the focus groups, researchers meet to debrief and voice and record any potential personal biases to ensure that the analyses would not be affected by researcher bias. Inductive content analysis (using QSR NVivo 7.0) was performed independently by two researchers, who met after completing their independent analysis of the focus group transcripts to determine the common themes that emerged (Miller and Crabtree, 1999). For a full description of study methods, please see van Zandvoort et al. (2010).

Tucker et al.

211

**Table 2.** Daycare providers' reports of preschoolers' physical activity behaviors and infrastructure, space, and condition of the daycare

Activity level of preschoolers		
Inactive	1	1.9
Somewhat active	19	35.2
Very active	34	63.0
Sufficient indoor space at daycare for physical activity		
Yes	27	50.0
No	25	46.3
Somewhat	2	3.7
Sufficient outdoor space at daycare for physical activity		
Yes	45	83.3
No	6	11.3
Somewhat	2	3.8
Sufficient infrastructure and facilities for PA		
Yes	25	46.3
No	28	51.9
Condition of daycare facility		
Excellent	6	11.1
Good	30	55.6
Fair	15	27.8
Poor	3	5.6

## Results

- (08) Daycare providers cared for children from a variety of ethnic backgrounds (i.e., white, black, Aboriginal, Latin American, Asian, and Arab). Ninety-six percent of daycare providers reported that it is very important that preschoolers are physically active; however, despite the importance of physical activity among preschoolers, as identified by childcare providers, a large number of participants reported that their daycare lacked sufficient space and infrastructure. Table 2 provides an overview of participants' satisfaction with the indoor and outdoor space and facilities (e.g. playground equipment, sports equipment, etc.) at their daycare, in addition to the condition of their venue.
- (09) Prior to asking participants about suggestions for improving the physical activity levels of preschoolers in their care, childcare providers were asked about the current activity level of these children. Some providers believed the children were quite active, mentioning that they were busy running around during the majority of the day. One participant said the children in her care are active '... all day long, unless they are sleeping. They run, they play, they do a lot of action songs. Sometimes we actually have to ask them not to run. They are outside for approximately an hour in the morning and an hour in the afternoon if time permits, so really they are quite active.' Another confirmed her charges '... are always running around; they are always active.' Other participants provided more specific reports of activity levels when she revealed that her attendees are active for '... at least two and a half hours on a typical day ...' An additional respondent reported that children in her care are active for '... [a]n hour in the morning and an hour in the afternoon plus we have a 10 to 15 minute large group activity'. The majority of participants were quick to report that preschoolers were engaging in approximately two to three hours of physical activity per day. Some daycare providers qualified their responses, indicating that activity levels were dependent on the individual child. For example, one respondent said, 'I would say because every child is different ... I would say an hour and a half to two hours ... It depends on the child and the day.' Another mentioned that 'there are some [preschoolers] that are constantly moving

The researcher reports findings organized into themes and supported with participants' quotes in qualitative research.

outside . . .’ while a separate provider noted ‘. . . so when we go outside, some of these children will choose just to stand, to sit by themselves, or to do quiet activities . . .’ Many daycare providers expressed the noticeable variation in children’s activity levels. In essence, daycare providers all noted that, overall, children were quite active during childcare hours; however, variations in activity levels were dependent upon the child and his or her personality, preferences, etc.

- (10) Only a few participants underscored that the preschoolers were not as active as they believed they should be. For example, one daycare provider said, ‘. . . even the time that they spend in gross motor things is very short.’ One respondent expressed her disappointment by saying, ‘[i]t is amazing to know how unfit this generation is . . .’ While, as a whole, daycare providers believed their charges were ‘very active’ (see Table 2), it appears as though some providers were concerned with the level of inactivity among some preschoolers.
- (11) When asked what would be required to enhance the physical activity levels of the preschoolers in their care, participants suggested: enhanced staff training/workshops; guest physical activity instructors; additional equipment and resources; and increased funds for physical activity. Each theme is discussed more thoroughly below.

#### *Enhanced staff training/workshops*

- (12) Participants were interested in additional physical activity-related staff training or workshops. For example, one participant said, ‘[but] I guess we ourselves need some more education, I know I myself do enjoy going to workshops, I need more education.’ Others confirmed, ‘. . . someone coming in to train one of us or a few of us on how to teach children’s aerobics or children’s yoga . . .’ and another participant confirmed, ‘. . . [I want] more workshops, more about physical activity and new and different ways to provide it . . . I’d like to hear it from colleagues, like from other, you know, people that have been in the field and know what it’s like.’ Another provider said, ‘I’d be even interested in sitting down, even if we couldn’t get it through the whole [YMCA], having our center come together on a Monday night . . . and have somebody in here. Even if we used the hallway and they showed us what we could do with the hallway.’ The daycare staff were clearly passionate about their jobs and were eager for workshops to improve their practice. Participants suggested incorporating physical activity workshops and training into their staff meetings or city-wide YMCA workshops. One participant even suggested having a physical activity specialist or expert at each daycare. She recommended having ‘. . . someone trained to be able to do those things [aerobics or yoga] . . . It would be neat if one of us was able to do that.’ Regardless of the venue for the training and workshops, participants felt it was important that they receive more instruction about diverse and creative types of physical activity so that they could better instruct and engage preschoolers in such activities.

#### *Guest physical activity instructors*

- (13) Daycare providers expressed their desire of having qualified people from the community come to the daycare and lead their children in physical activities. For example, one respondent noted:

. . . we had an excellent girl down at the Y. She was absolutely amazing. And she would come over to the center and she would do . . . exercise. Oh my gosh, they loved it. First of all, it’s someone new . . . For months . . . they were doing all the exercises and all the activities . . .

An additional participant noted the ability of daycare classes to teach other classes the activities and exercises they have learned. Specifically, this participant suggested:

[it] would be neat if we could have someone come to the center and say, ‘this week, Barb is coming and she is going to do Yoga with Preschool 4,’ and then once she showed preschool 4, then preschool 4 could show preschool 3 and then the next week, have somebody else that comes in and shows them how to do something else . . .

Participants thought it would be effective to have guest physical activity instructors come to the daycare because the children enjoy learning from someone new, and it often allows the daycare providers to learn new activities to incorporate into their daily physical activity curriculum. The only concern the focus group respondents had with the idea of guest instructors was, as one participant pointed out, ‘. . . it always falls back, unfortunately, on the front-line staff, so we’re the ones making the hour phone call on the lunch looking for a yoga instructor to come in to [teach] the kids.’ On the one hand, focus group participants were excited about the idea of having guest physical activity instructors come into their classroom, and they thought it would be an exciting opportunity for the children. However, they suggested that the logistics of arranging these guest teachers need to be streamlined to reduce the additional time required by daycare providers.

#### *Additional equipment and resources*

- (14) Participants listed enthusiastically many pieces of equipment and additional resources that would help them facilitate increased physical activity among the preschoolers in their care. Respondents indicated a need for ‘exercise balls,’ ‘hula hoops,’ ‘gym-type equipment (i.e., gym mats and apparatus),’ and ‘a climber.’ Another participant said, ‘[we] need more bikes, more like actual equipment.’
- (15) Daycare providers also spoke of their desire for additional resources that would provide ideas for engaging the children in physical activities. For example, one participant spoke of a resource she uses frequently:
- . . . a little flip calendar with an activity on one side and a recipe on the other. I don’t know how many times I have gone to that and just flipped through it and ‘oh, that one looks good’ because I mean, like I said, we just sometimes forget about the stuff that we used to know.
- (16) Daycare providers did suggest, however, that if a resource manual was to be created that it needs to be easy to use and quickly accessible. One participant stated:
- I don’t have time to read a manual this [very] big. If it was short tidbits even once a week that you could stick in the communication book . . . If it’s a paragraph, I have a minute to read a paragraph about a fresh new idea or fresh new resource or somebody willing to do that. Short and sweet . . .
- (17) Participants had some creative ideas about different ways to facilitate resource development and sharing. Specifically, one participant mentioned:
- . . . why don’t we network in a newsletter or some sort of form or at a staff meeting and say every center . . . takes turns, one center every staff meeting comes up with a new activity and sends it to everybody and shares it.
- (18) Participants were clear that any extra equipment and resources that could be provided to them would help facilitate physical activity in the daycare. One participant summed up the sentiments of most daycare providers when she said, ‘[free] resources would be fabulous.’

*Increased funds for physical activity*

- (19) Daycare providers spoke many times of the funding limitations experienced at their respective centers. One participant indicated that because they are required to provide gross motor activities to the children in their care, funds should be set aside to facilitate these activities. Specifically, this participant believed, ‘. . . they want us to do that [gross motor activity] with their children, so [we need] some kind of specific fund for gross motor.’ Another stated, ‘. . . if there was some kind of physical activity grant that every daycare got and then with that you could go buy a bunch of new balls.’ Another respondent spoke of the challenge of being provided with suggestions for physical activities, but not having the finances to put the activities into practice. She stated, ‘. . . it isn’t just the ideas. We can come up with some fabulous ideas, but then we don’t have the money to put the materials into effect.’ Participants were clearly challenged by the lack of funds when implementing physical activities at their daycares.

- (20) Participants also spoke of their need for gross motor space (i.e., a gym) at their daycares; for example, ‘a big padded room would be fabulous.’ However, the majority of the daycare facilities were unable to provide a room devoted to physical activity due to funding limitations. One participant said:

[the] reason why we had a new center open . . . and the reason why they didn’t put in one [a physical activity room] is because of money, they can’t feasibly put one in because they can’t make money with an empty room so it comes down to money.

- (21) Respondents were also concerned by the lack of government (financial) support they receive. For example, one participant expressed, ‘[when] you look at the school board, the teachers get so much . . . we need government support like the teachers get.’ Another echoed this sentiment when she said:

. . . you have to replace these balls that don’t last. Well it costs money, you know, and those are resources that we don’t have, that we should have, that the school would have but we don’t get that. The government gives us nothing.

- (22) Another exclaimed, ‘[they] say zero to six [years] is an essential part of a child’s learning and that’s [when] we are working with them . . . but we have so much less resources, money . . . support, support, there’s that word. Yes. It’s frustrating.’ Participants emphasized that they did their best to incorporate physical activity into the daycare hours and facility, but they were challenged by the lack of funds and government support they received to increase these behaviors effectively.

*NASPE physical activity guidelines*

- (23) At the conclusion of the focus groups, the moderator described the NASPE physical activity guidelines for preschoolers and asked the daycare providers how feasible it was for the children in their care to achieve these guidelines (i.e., that preschoolers accumulate 60 minutes daily of structured physical activity, and at least 60 minutes [and up to several hours] of daily, unstructured physical activity; National Association for Sport and Physical Education, 2002). The majority of participants felt that the children in their care were already reaching the NASPE guidelines, as reflected by one participant who said simply, ‘[i]t’s easy. We do [it] all the time. We spend more than two hours.’ Another confirmed, ‘I think that’s very achievable here.’ Other participants felt the weather was a determining factor in whether these children were ‘sufficiently’ physically active. For example,

one individual said, '[in] good weather it would be fine . . .,' while another agreed, '[g]ood weather, yes. Crummy weather, wet weather would be a lot more of a challenge.' Overall, the majority of participants were confident that the preschoolers in their care were engaging in the recommended amount of physical activity per day (i.e., at least 120 minutes); however, a few daycare providers were concerned that the children were not achieving 60 minutes of structured physical activity per day. For example, some participants explained:

P(3): Definitely [they engage in] the 120 minutes of physical activity, yes.

P(5): That's a definite, but not structured.

P(3): But not sixty minutes of structured physical activity, no.

## Discussion

- (24) The primary purpose of this study was two-fold: 1) to gain insight into the current physical activity levels of preschoolers, with regard to the feasibility of meeting the NASPE physical activity guidelines; and 2) to identify providers' suggestions for improving these preschooler's physical activity levels. Considering these objectives, a number of findings warrant discussion. First, the NASPE physical activity guidelines state that 'individuals responsible for the well-being of preschoolers should be aware of the importance of physical activity and facilitate the child's movement skills' (National Association for Sport and Physical Education, 2002). Based on the results of the present study, it is clear that the vast majority of daycare providers interviewed possess an understanding of the value of physical activity among preschoolers, and do their best to facilitate these behaviors where and when possible. This coincides with the findings of an Australian study by O'Connor and Temple (2005), who noted a general agreement among family daycare stakeholders (i.e., parents, staff, and caregivers) that physical activity is an integral part of young children's lives, and consequently, of the daycare setting. The fact that 96 percent of the daycare providers in our study felt that it was 'very important' for preschoolers to be physically active may represent our most significant finding, as a discussion related to resources would be irrelevant if staff members did not acknowledge the value of physical activity.
- (25) A second finding that warrants discussion pertains to the fact that the majority of daycare providers believed that the children in their care were 'very active.' This notion was further supported by participants who indicated that they felt confident that the preschoolers were able to meet or exceed the NASPE guidelines for physical activity. While these results offer support for the conclusion that individuals who directly oversee children of preschool age (e.g., parents and caregivers) perceive that preschoolers engage in sufficient and high quality physical activity behaviors during childcare (Benjamin et al., 2008; O'Connor and Temple, 2005; Tucker and Irwin, 2009), it does not correspond with the growing literature which suggests that preschool-aged children are insufficiently active (Cardon and De Bourdeaudhuij, 2007; Pate et al., 2008; Tucker, 2008). The disconnect between daycare reports of physical activity and the actual levels of physical activity among preschools has been noted in a similar study in London Ontario (Tucker and Irwin, 2009).
- (26) It should also be noted that a number of daycare providers in the current study qualified their responses, pointing out that weather and individual differences among children influenced the physical activity levels of the preschoolers in their care. Interestingly, the caregivers and parents in O'Connor and Temple's (2005) study on physical activity levels in family daycare partially support this finding; they noted that the weather, individual caregivers, and 'diversity of children in care'

The researcher relates the meaning of the findings with past studies in qualitative research.

influenced physical activity levels. In Canada, the weather poses a barrier for physical activity in that the climate is diverse, with seasonal temperatures ranging from extremely hot to extremely cold. This is consistent with other literature that has noted seasonal variations in physical activity due to weather (Poest et al., 1989; Tucker and Gilliland, 2007; US Department of Health and Human Services, 1984).

- (27) Given this seasonal variation in physical activity levels, a consideration of the availability of sufficient and ‘quality’ indoor and outdoor space is essential. This is emphasized in the NASPE guidelines, which state that ‘preschoolers should have indoor and outdoor areas that meet or exceed recommended safety standards for performing large muscle activities’ (National Association for Sport and Physical Education, 2002). Similarly, Timmons and colleagues have suggested that whenever possible, preschool-aged children should be given access to sufficient space and resources outdoors (Timmons et al., 2007). Interestingly, while most focus group participants in the present study felt that there was sufficient *outdoor* space for children’s physical activity, only half of all respondents believed that their *indoor* space was adequate. For a variety of reasons including the weather-related issues discussed above, this perceived lack of sufficient indoor space is problematic.
- (28) The third set of findings that warrants discussion relates to the issue of structured versus unstructured physical activity. In the present study, most participants indicated that they felt that the preschoolers in their care were engaging in appropriate levels of *unstructured* physical activity per day; however, some noted lower levels of *structured* physical activity. Researchers have suggested that including regular structured physical activity into the daycare schedule might facilitate increased physical activity among preschoolers, more so than unstructured free-time for play (Cardon et al., 2009). The perceived lack of structured physical activity among preschoolers in the present study is disconcerting in that this form of activity could represent one means of ensuring that children engage in physical activity at the frequency, intensity, and duration necessary to achieve the NASPE guidelines.
- (29) Finally, it is important to highlight the needs outlined by daycare providers as it has been suggested that ‘strengthening the supports and resources to the early childhood education sector during this critical period of child development should be seen as an important intervention in the attempt to reduce the incidence of childhood overweight and obesity’ (Pagnini et al., 2007). Despite the fact that most daycare providers in the present study felt that the children in their care were sufficiently active, participants also outlined a number of tools and resources that would assist in enhancing the physical activity levels of these children. These included the implementation of staff training/workshops, guest physical activity instructors, additional equipment and resources, and increased funds for physical activity. These suggestions coincide with the findings of other researchers who have documented that daycare providers feel that improved resources, training, and professional development would better equip them to implement physical activity for preschool-aged children (O’Connor and Temple, 2005; Pagnini et al., 2007; Poest et al., 1989). Interestingly, in a recent study using an objective measure of physical activity, children were found to engage in more moderate to vigorous activity if their preschool had: a) higher quality scores (as rated on the Early Childhood Environment Rating Scale-Revised, including space, furnishings, personal care routines, activities, program structure); b) less fixed and more portable playground equipment; c) lower use of electronic media; and d) larger playgrounds (Dowda et al., 2009). Thus, it was concluded that daycare providers and health professionals ‘can modify the preschool environment in ways that help children spend more time in physical activity and less time in sedentary pursuits.’ In other words, it is not necessarily the provision of additional funds or resources that is essential, but instead, how effectively new – and existing – funds and resources

The researcher interprets the limitations and implications of the findings as well as personal reflections about the study in qualitative research.

can be allocated and/or utilized. The training of existing staff (through workshops and guest presenters) may represent one means of effectively and efficiently enhancing physical activity behaviors in the daycare setting. It should also be noted that the majority of the daycare providers in our study were extremely eager and welcomed the idea of giving up their evenings to attend workshops and learn new skills in service of the health of preschoolers.

### Future directions

- (30) Due to the apparent discrepancy between what daycare providers perceive regarding preschoolers' physical activity levels (i.e., that they are sufficient and meet the NASPE guidelines for physical activity) and the literature which suggests that the majority of preschoolers' time is spent in inactivity (Oliver et al., 2007), additional research in the area is needed. Specifically, investigations that utilize objective measures to quantify physical activity (i.e., accelerometers and/or pedometers) are necessary to accurately and reliably establish physical activity levels among preschoolers (Cardon and De Bourdeaudhuij, 2007; Oliver et al., 2007).
- (31) The development and evaluation of interventions to promote physical activity among preschoolers is also imperative. While childcare centers serve as appropriate – and relatively untapped – settings for physical activity interventions, van Sluijs and colleagues noted that intervention studies in preschoolers are rare (van Sluijs et al., 2008). Additionally, Oliver and colleagues suggested that objective quantifications of preschoolers' physical activity are essential to establish the effectiveness of physical activity interventions (Oliver et al., 2007). Thus, once accurate physical activity prevalence data are available, a logical next step for researchers is to design and implement evidence-based and age appropriate intervention studies to promote physical activity among preschoolers.

### Conclusion

- (32) While the daycare setting represents an instrumental setting for the modification of children's physical activity and lifestyle behaviors, research suggests that physical activity levels among preschoolers are inadequate. The childcare setting has been found to be a strong predictor of physical activity (Finn et al., 2002); thus, developing and utilizing programs, strategies, and resources that are informed by daycare providers may be an effective way to target sedentary behaviors among this population. Accordingly, childcare providers' suggestions of how to maximize opportunities for physical activity during daycare hours should be considered when developing and implementing daycare interventions, curriculum, and policies.

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The back matter includes a list of references and information about the authors.

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