



Subject: Scientific research

Topic: Additional information lecture 2

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You will find here information from the book that are not mentioned in the sheet.

## **Chapter 4**

### **4.1 Study approach**

- The decision about the exact study question must be made in conjunction with the decision about the study approach to use. At a minimum, a choice must be made early in research process about how data will be gathered.
- If the plan is to synthesize current knowledge by conducting a literature review the researcher must be prepared to track down the full text of all relevant articles. Researchers with a university affiliation need to check with the university library about its policies (and possible fees) for acquiring articles that are not part of the university's collections. Researchers without a university affiliation must consider the costs involved in accessing all of the required articles.

### **4.2 Conceptual and Theoretical frameworks**

- Many research projects benefit from the development of a conceptual model that will inform the design, implementation, and interpretation of the study.
- A variety of established theoretical frameworks that are based on extensive reviews on published literature can inform the components and flows of the conceptual framework for a new research study. For example, several popular theories describe the factors that influence individual health beliefs and behaviors. Conceptual and theoretical frameworks are especially common in the nursing, social science, and educational research literature.

### **4.3 study goal and specific objectives**

A study goal often includes the specific exposure, disease, and population that will be the focus of the study.

The specific aims of already published paper related to the topic are often helpful resources when refining the research objectives or a new study.

## **Chapter 5**

### **5.1 collaborators and consultants**

- Although some papers in the health sciences have only one author, the typical paper has about four coauthors and some have dozens of coauthors.
- Sometimes, the term "lead researcher" is instead used to refer to the senior researcher, an experienced researcher who guides the work of a newer investigator.
- Mentors can help the lead author identify and connect with other potential collaborators, such as experts on the study population, experts on the exposure or disease being examined, experts on the study design or methods being used for the project, and technical experts such as statisticians and laboratory specialists.

- For international research projects, at least one local researcher at the study site should be a coinvestigator who is involved in every step of the research process, including the identification of the study question, the design of the study, and the collection of data.

-The lead author should have a conversation with all potential contributors about the amount of time they can dedicate to the project or their expectations regarding compensation and authorship. For example a statistical consultant may ask to be paid by the hour to help a researcher think through analysis options as a non-coauthor, or the statistician may waive the consulting but request coauthorship in return for the development of a data analysis plan or another arrangement may be requested.

## **5.2 finding research mentors**

- Sometimes a new investigator does not have a choice about who will supervise a project because the supervisor is assigned by an employer or an academic program director. In this situation, the individual may find it helpful to seek out a team of several mentors who can provide supplemental guidance and advice during the project. (If these individuals may earn coauthorship as a result of their mentorship, their project-specific involvement must be approved by the assigned primary supervisor prior to involving them in the project. The supervisor does not need to approve other mentorship roles, such as those that relate to general professional development.)

- Student researchers writing theses or dissertations may need to identify a primary mentor and then recruit several additional established scholars to serve on their research committees. New investigators who work in a unit or study in a program, that does not have a research requirement may have to seek out their own supervisors and mentors for projects.

- When seeking research mentorship, it is important to find mentors who are a good match to the needs and personality of the mentee.

-The new investigator should be prepared for the contacted individuals not to respond or to reply with a message indicating that they are not currently accepting new mentees, interns, or research assistants. Even if a meeting is scheduled, not all conversations will yield a mentor-mentee relationship. An invitation to meet is not an agreement to serve as a mentor. However, all conversations have the possibility of pointing the new investigator to useful resources, including contact information for other individuals who might be well suited to serve as mentors.

## **5.3 the mentor-mentee relationship**

Some formal research mentorship programs require both mentors and mentees to sign an agreement letter that spells out the commitments of both parties, but most mentorships are less formal.

## 5.4 professional development

No one senior researcher, or even a team of research coaches, can provide all of the professional mentorship that a rising researcher requires.

## Chapter 6

### 6.1 coauthorship

- Good coauthors adhere to the highest ethical and professional standards in how they design studies, interact with collaborators and study participants, analyze data, and report their findings. They ask lots of questions so that they fully understand the research project's protocols, the roles and responsibilities of all collaborators, and the decisions made about manuscript drafts. They pay attention to details, and they provide valuable feedback to the lead author and other members of the research team. They are committed to developing their technical writing skills. They disclose potential conflicts of interest. They accept responsibility for their own contributions and for the project as a whole. They treat all members of the research team with respect. And they respond quickly to research communications and never miss a deadline.

- Being a supporting member of a research team provides an opportunity to become familiar with academic writing and publishing and to develop the habits of good coauthorship.

- Students working for professors are often hesitant to ask if they will be listed as coauthors on the manuscripts that result from the projects they are supporting. Similar uncertainty might arise for those who are consulted about a research project because they have Special technical or other skills but who are not asked to be involved in drafting the subsequent paper.

### 6.2 authorship criteria

Examples:

- A person who conducts interviews for the project but does not contribute further would not be eligible for authorship. However, an interviewer who also writes a paragraph for the discussion section would meet authorship criteria.
- A hospital laboratory technician who analyzes blood samples of patients included in a clinical study but makes no further contributions would not be eligible for authorship. A lab tech who analyzes the samples and writes part of the methods section describing laboratory techniques would be a coauthor.
- A data entry assistant who makes no additional contributions to the project would not be considered an author. A data manager who runs statistical tests and creates a results table for the manuscript would meet authorship criteria.

- A technical editor who cleans up the grammar and spelling in a manuscript does not earn authorship. An editor who raises important questions about the interpretation of the results and the meaning of the work may be eligible for authorship.
- Senior researchers who provide funding and supervision for a project usually qualify for authorship, but supervision alone—when not accompanied by involvement in study design or interpretation as well as writing or editing—is not sufficient to justify coauthorship. Just like any other contributor, sponsors and supervisors must make a meaningful intellectual contribution to a project to merit authorship.

### 6.3 authorship order

For most disciplines in the health sciences, the first author (or lead author) is the person who was the most involved in writing the manuscript. Although this is often the person who took the lead in the whole study process from design through analysis and writing, this is not always the case. Sometimes the person who designed the study and collected the data is unable to conduct the analysis and to write up the results, or that person (often a senior researcher) turns the responsibility of writing the manuscript over to someone else who is subsequently listed as the first author. Sometimes multiple people are involved in study design and data acquisition, and one person is asked by the group to take the initiative to generate a draft paper. Sometimes organizations make data sets available to researchers for secondary analysis, and the organizations may not request authorship for any of the employees involved in study design or data collection. In all of these situations, the person who does most of the writing is often designated as the first author. When there is any doubt as to who is making the most significant contribution, the decision about who will be first author should be made in consultation with all of the people who took a major role in conducting the study.

The remaining authors are usually listed in order of contribution, which is usually defined in terms of time dedicated to the project as well as intellectual contribution. The person who contributes the second most amount of time and energy to the project is listed as second author, and so on. When many coauthors are involved, it is sometimes difficult to quantify the relative contributions of, say, the seventh and eighth authors. In this situation, the coauthors should be consulted about their preferences, but the best solution may be to list authors with equal contributions in alphabetical order.

The one exception to the rule about listing authors in order of contribution is that the senior author—usually the primary research supervisor for a student or research group—is often listed as the last author, even if he or she was heavily involved in all aspects of the work and might otherwise be the second author.

Not every paper has a senior author. However, students are usually required to have a professor or other approved supervisor oversee their work, and it is usually helpful for relatively inexperienced researchers to seek out a senior investigator to serve as a mentor. The senior author may or may not be heavily involved in the day-to-day details of the study

but meets the authorship criteria by providing clarity and direction along the way and by providing critical feedback on the manuscript. Additionally, the senior author can serve as a mediator if disputes about authorship or other issues arise. An experienced researcher will be able to provide insight into disciplinary standards and can prevent or resolve many of the issues that might befuddle a newer researcher.

#### **6.4 decisions about authorship**

There should be no surprise about who is being included or excluded as an author. The lead researcher (or senior researcher) should check with each contributor about expectations. Ideally, this conversation should take place before anyone begins work on project-related tasks. If everyone agrees that a person expected to make only a minor contribution will not earn coauthorship, make sure that the person is not asked to write any more of the paper or to provide critical feedback on a draft. If everyone agrees that someone will be a coauthor, make sure that the person has the opportunity to make an important intellectual contribution to the paper.

Authorship decisions can be very stressful. They can trigger strong emotional responses, and they can sometimes harm relationships among researchers. Lead researchers therefore need to be transparent with everyone involved in the project not only about who will and will not be contributing in ways that merit coauthorship, but also about the role each person will be playing. A growing number of journals now require a description of what each coauthor contributed to a manuscript and how each met the authorship criteria. It might be helpful to draft that statement before writing any other part of the paper, so that anyone who sees the draft knows what is expected of each coauthor.

-Sometimes the list of expected contributors might change during the project. Perhaps a new collaborator is needed to run advanced statistics or to provide an expert's perspective on the policy implications of the work. In such cases, all coauthors need to be immediately informed about the addition. When the addition of new collaborators significantly alters another contributor's position in the order of authors, perhaps bumping a person from second to fourth author, the affected person must be consulted and an agreement reached before any promises are made to the new coauthors.

Any disputes over authorship criteria or the order of authors are usually best referred to the senior author on the paper. The written guidelines for authorship from ICMJE, relevant professional societies, and/or the target journal may also be helpful for resolving disputes. Coauthors with concerns should speak with the lead author first, before appealing to the senior author or other authorities.