Research Design and Methodology II

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**Assignment #3: Instructor Assignment Essay**

Answer the following questions in an essay format, with 1-2 fully developed paragraphs for each question. Include citations/references from your Developmental Reading log.

Review the OGS PhD/DPhil Prospectus Tutorial. You will develop your prospectus in a later course.

Based on the Research Questions you developed in Core 3, and a real or hypothetical validated survey instrument, compose hypotheses for a quantitative study. Hypotheses should be formatted as follows: 'H01: No statistically significant difference exists in [dependent variable] between [group 1] and [group 2] among [participants]' for quasi-experimental and causal-comparative designs, or 'H01: No statistically significant relationship exists between [variable] and [variable] among [participants]' for correlational designs. Formatting hypotheses correctly is important to establish a strong research design.

Why is a null hypothesis necessary? Why is a null hypothesis rejected rather than the alternative hypothesis accepted? What does the null hypothesis say about the “prevailing knowledge” about the problem?

What are the criteria for rejecting a null hypothesis? How does the alpha level (typically .05) relate to the p-value (probability) when deciding whether or not you can reject your null hypothesis based on statistical tests?

How should your Literature Review (Chapter 2) inform your research design and methodology in Chapter 3? What is the connection between theoretical/conceptual frameworks from the literature and research questions, instrumentation, variables, and hypotheses?

How does thematic analysis in qualitative research help answer research questions? How are themes abstracted from transcripts or written responses from participants in basic qualitative designs?

Include a title page, well-developed introduction and conclusion paragraphs, a references page, and in-text APA-formatted citations to support your responses.

# Introduction

Agriculture has been a critical component of human life throughout history, not only for substance but also as a significant economic sector, from farm labor to food processing. The agricultural industry has been a major source of technological advancements and a labor-intensive sector. Many tasks on farms have been mechanized, which has produced more acres farmed and more yield per acre. Nevertheless, many farm tasks require farm labor, mainly seasonal and migrant farmworkers, and much of their labor is outdoors during the hot summer months, which has heat risks to seasonal and migrant farmworkers' health.

Based on the Research Questions you developed in Core 3, and a real or hypothetical validated survey instrument, compose hypotheses for a quantitative study. Hypotheses should be formatted as follows: 'H01: No statistically significant difference exists in [dependent variable] between [group 1] and [group 2] among [participants]' for quasi-experimental and causal-comparative designs, or 'H01: No statistically significant relationship exists between [variable] and [variable] among [participants]' for correlational designs. Formatting hypotheses correctly is important to establish a strong research design.

# Problem Statement

The problem is heat-related illnesses among seasonal and migrant farmworkers because of their exposure to high temperatures in their work environment (El Khayat et al., 2022), (Hyland et al., 2024)

# Purpose Statement

The purpose of this ~~survey~~ study will be to test the theory of the socio-ecological model

that considers multi-factor contributing to the heat-related illnesses of seasonal and migrant farmworkers that will compare cooling strategies to heat health scores of seasonal and migrant farmworkers in southern Idaho. The independent variable will be defined as cooling strategies (ex., drinking water, taking breaks, shade cover, cooling clothing, etc.). The dependent variable will be defined as heat health index score (ex., multiple questions that identify the level of heat relief and health status).

# Significance

This study will contribute to the gap in research on heat-related illnesses among seasonal and migrant farmworkers by identifying what cooling strategies work best to protect seasonal and migrant farmworkers from heat-related illnesses.

# Research Questions

RQ1: What is the relationship between different cooling strategies and heat health scores?

# Research Methodology

This study will utilize quantitative methodology because hypotheses derived from research questions will be tested using statistical analysis.

# Instrumentation

This study will utilize the National Agricultural Workers Survey (NAWS) instrument, which measures cooling strategies and heat health index (hypothetically) (Curl et al., 2020)

# Research Design

Correlational: Examine the relationship between two continuous variables within the same group from a validated instrument (quantitative, deductive). This quantitative study will utilize a correlational design to examine the relationship between cooling strategies and heat health scores among seasonal and migrant farmworkers.

# Population and Sampling

The target population for this study will be seasonal and migrant farmworkers in southern Idaho. A stratified simple random sample of seasonal and migrant farmworkers by county in southern Idaho will be taken to make inferences about the larger population of seasonal and migrant farmworkers in southern Idaho (Mukherjee et al., 2018).

# Hypotheses (Quantitative Only)

Correlational:

H0: No statistically significant relationship exists between cooling strategies and heat health scores among seasonal and migrant farmworkers. ~~(Langer et al., 2023)~~

Ha: A statistically significant relationship exists between cooling strategies and heat health scores among seasonal and migrant farmworkers. ~~(Langer et al., 2023) (Terrell, 2021)~~

# Data Analysis Plan

Quantitative:

This study will test data for normality and relevant assumptions of appropriate statistical procedures. If data do not meet assumptions for parametric procedures (results apply to the population), nonparametric procedures (results apply only to the sample) will be utilized.

This study will utilize Pearson’s Product Moment of Correlation (parametric) or Spearman’s Rank Correlation (nonparametric) to test the hypotheses for statistically significant relationships.

Why is a null hypothesis necessary? Why is a null hypothesis rejected rather than the alternative hypothesis accepted? What does the null hypothesis say about the “prevailing knowledge” about the problem?

The null hypothesis is necessary to establish a framework to evaluate the findings of the research (Shearer, 2017). The research question informs the hypothesis statements, so that the research question could be answered through evaluating the data in context of the hypothesis statements, “A research question is a focused question which expresses the research intention (the action) about the research focus (the phenomenon of interest) to address the research problem. The question should be able to be answered through the analysis and interpretation of data.” (Walshe & Brearley, 2020, p. 48). The null hypothesis states that there is no difference between the variables; the null hypothesis is either accepted to be true or rejected to be false based on the outcome findings of the data analysis. If the null hypothesis is rejected, then the alternative hypothesis is accepted, that there is a statistically significant difference between the variables.

What are the criteria for rejecting a null hypothesis? How does the alpha level (typically .05) relate to the p-value (probability) when deciding whether or not you can reject your null hypothesis based on statistical tests?

The typical criterion for rejecting the null hypothesis in the social sciences is an alpha of .05. When the p-value is less than .05, the difference between the variables is found to be statistically significant, and the null hypothesis can be rejected. The alternative hypothesis can be accepted.

How should your Literature Review (Chapter 2) inform your research design and methodology in Chapter 3? What is the connection between theoretical/conceptual frameworks from the literature and research questions, instrumentation, variables, and hypotheses?

The literature review serves several purposes, including finding gaps in research surrounding the research topic, “Regarding our second research aim to inform understanding of gaps in the existing literature.” (Bloss et al., 2022, p.437) and to gain further understanding of the topic area and what research findings have been discovered (El Khayat et al., 2022), to help the researchers understand the context of their research from the perspective of prior research.

How does thematic analysis in qualitative research help answer research questions? How are themes abstracted from transcripts or written responses from participants in basic qualitative designs?

In qualitative research, narrative questions are asked to yield narrative-based responses so that researchers can perform context analysis on the respondents (Walshe & Brearley, 2020) derive summaries of responses, and find patterns through thematic analysis. This allows the researchers to communicate the research findings within the context of the research questions and the theoretical framework (Mukherjee et al., 2018).

# Conclusion

Even though agriculture has many technological advances, farming includes many farm workers doing manual labor in the summer months and as the average summer temperatures increase due to climate change. These farmworkers are at increased risk of heat-related illnesses, and finding the most effective cooling strategies to reduce the risk of heat-related illnesses is essential to the health and well-being of seasonal and migrant farmworkers and the economic health of the agriculture sector.

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