Welcome to

KINESIOL 1K03

Foundations in Kinesiology

Unit 1: Research Methods – Qualitative vs. Quantitative Designs

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Notes & Reminders

If you miss a tutorial for whatever reason, it is up to you whether or not you would like to use your MSAF for the 2% (or save it)

- **If you do choose to use an MSAF** (still eligible for 2%) **follow up with myself and your TA, you will be instructed to watch the tutorial recording** and you will have a separate small assignment to make up
- **If you do not choose to use an MSAF** (forfeiting the 2%) regardless, **follow up with your TA** and **watch the tutorial recording** on MS Teams to catch yourself up on missed content

Learning Objectives

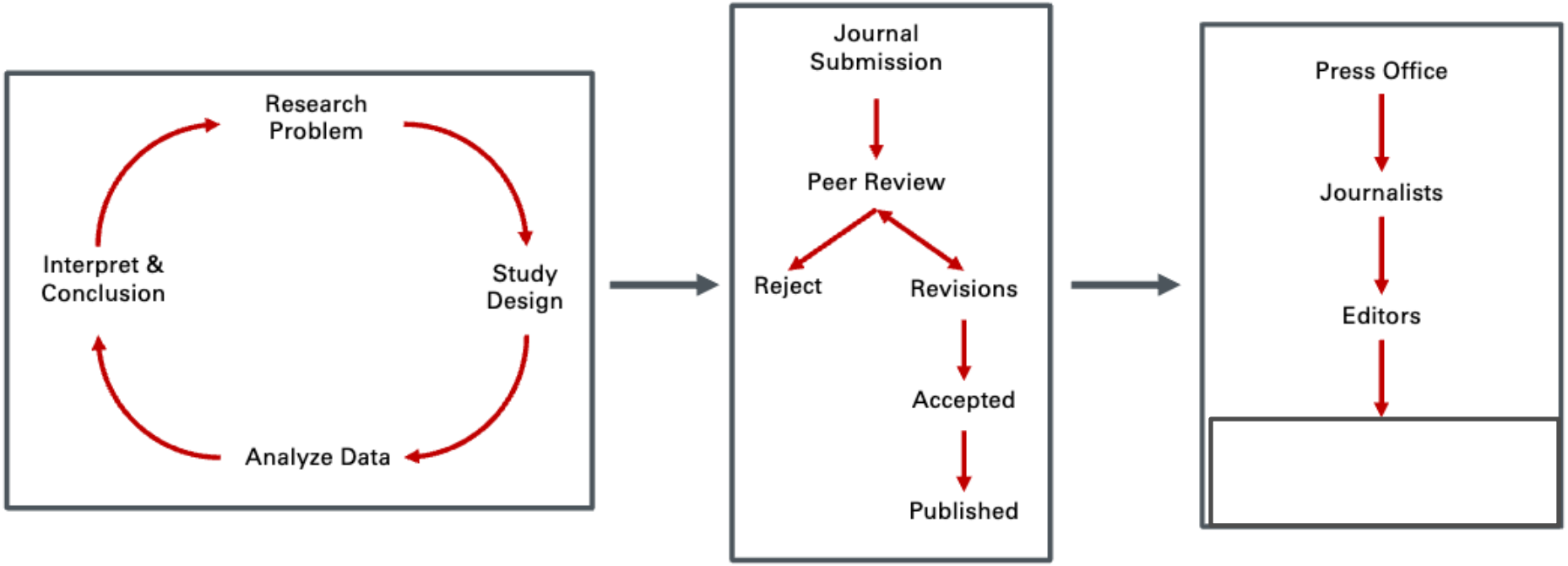
1. Introduction to **characteristics of scientific research**
2. Understanding **quantitative** research designs and its use in kinesiology
3. Understanding **qualitative** research designs and its use in kinesiology
4. First homework assignment to prep for next lecture **(End of Lecture)**

Why is Research Important?

Have you ever wondered...

- What makes a healthy diet?
- What are the best ways to study?
- What are the best ways to exercise?

Research Roadmap



Understanding Research

How do we understand a phenomenon of interest?

Tennis and Elbow Biomechanics

WHAT are the forces on the elbow during tennis?

HOW do these forces affect the state of musculoskeletal tissues?

WHY do these forces damage musculoskeletal tissues?

Understanding Research

Two main branches of research

Seeking answers to fundamental scientific questions aimed at expanding current state of knowledge.

Seeking immediate answers to specific questions addressing direct "real world" practical problems (ecologically valid)

The Scientific Method

Commonality of Basic and Applied Research

- Well-defined problem and/or question
- Hypothesis driven
- Data Dependant
- Allows for **interpretation of results**

Understanding Research

Research is a 4 Step Process:

1) Developing and Defining the problem/gab in knowledge

Isolating the variables

- **Dependent Variable:** Outcome measure of interest
- **Independent Variable:** Variables that are tested for their effects on the dependent variable
- **Subject Variable:** Who (or what) is being tested

Understanding Research

For example:

Examining the effect of cell phone distractedness on learning in classrooms in undergraduate students.

- **Dependent Variable:** Outcome measure of interest
- **Independent Variable:** Variables that are tested for their effects on the dependent variable
- **Subject Variable:** Who (or what) is being tested

Understanding Research

Research is a 4 Step Process:

2) Formulating the Hypothesis

Scientific research is theory and hypothesis driven

A theory is a collection of ideas that have explanatory and/or predictive value (answering the **“what”, “how”, and “why”)**

- Supported by evidence
- Consistent with large amount of observations
- Testable with clear, falsifiable predictions (hypothesis)

Understanding Research

Research is a 4 Step Process:

2) Formulating the Hypothesis

Null Hypothsis (H_0)
There is no significant effect, relationship, or difference between variables.

Alternate Hypothesis (H_1)
There is a significant effect, relationship, or difference between variables.

Understanding Research

Research is a 4 Step Process:

2) Formulating the Hypothesis

For example:

Examining the effect of cell phone distractedness on learning in classrooms in undergraduate students.

H_0: Cell phone distractedness has no effect on learning outcomes in undergraduates.

H_1: Cell phone distractedness negatively affects learning outcomes in undergraduates.

Understanding Research

Research is a 4 Step Process:

3) ___Collecting the Data_____

Internal vs. External validity

Internal validity: The degree of confidence that the causal relationship you are testing is not influenced by other factors/variables

External validity: If the outcome is generalizable to populations beyond the tested sample

Understanding Research

Research is a 4 Step Process:

4) Analyzing and Interpreting the results

For example:

Examining the effect of cell phone distractedness on learning in classrooms in undergraduate students.

H_0: Cell phone distractedness has no effect on learning outcomes in undergraduates.

H_1: Cell phone distractedness negatively affects learning outcomes in undergraduates.

Understanding Research

Research is a 4 Step Process:

4) Analyzing and Interpreting the results

When you fail to reject the Null Hypothesis

- **This means your data <u>does not</u> provide enough evidence to support the alternative hypothesis.**
- **It doesn't prove that H_0 is true (it just means you can't confidently say it's false)**

Understanding Different Types of Research in Kinesiology

- Data-driven
- Numbers & percentages
- Concrete & objective

- Design thinking
- Quotes & expressions
- Abstract & subjective

What is Quantitative Research?

How Much? How Many?

Type of research that includes _____numerical data_____ of empirical data

- Can generalize data from large samples
- Data is collected through structured and controlled instruments to be quantified
- Surveys **(ratings, scales, closed-ended questions)**
- Experiments **(based on scientific research)**

What is Qualitative Research?

Why?

Type of research that aims to gather and analyze _____non-numerical data_____ to gain an understanding of attitudes, beliefs, and motivations

- Understand big-picture habits
- Gathers verbal and open-ended responses
- 1-on-1 interviews, focus groups, surveys **(open-ended questions)**

Examples of **Quantitative** Methods

How did Dr. Tuckey's first hockey season go?

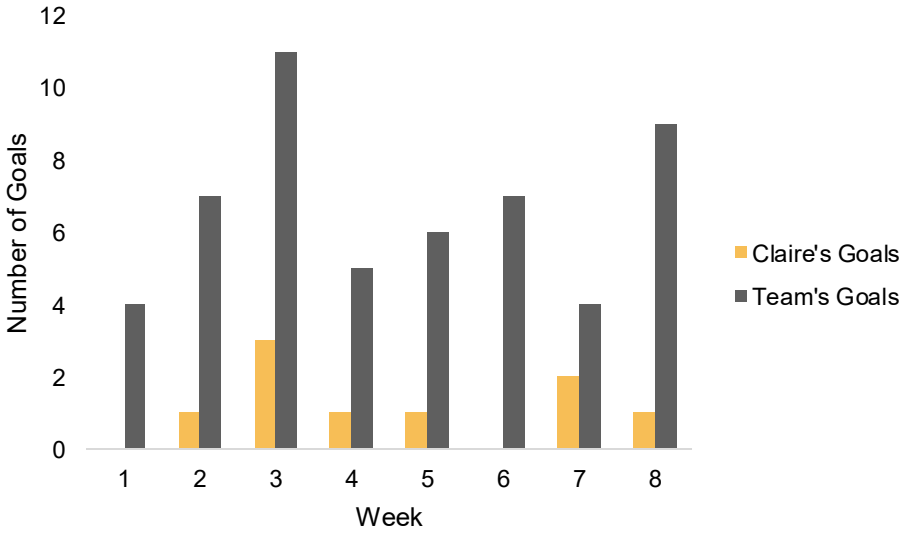
How many goals did Dr. Tuckey score in the Women's Beginner season?

How many wins did Dr. Tuckey's team have throughout the season?

What place did Dr. Tuckey's team rank overall in the season?

Quantitative Results

How many goals did Dr. Tuckey score in the Women's Beginner season?



Dr. T's Average = 1.13 goals (16.98%)

Score Average = 6.63 goals

Quantitative Results

How many wins did Dr. Tuckey's team have throughout the season?

Team	GP	W	L	PTS
Orange Crush	8	7	1	53

Quantitative Results

What place did Dr. Tuckey's team rank overall in the season?

Team	End of Season Rank
Orange Crush	**1**
Queen Bs	2
GOALden Girls	3
No Drama Llamas	4
Mighty Moms	5
Ice Angels	6

Examples of **Qualitative** Methods

How did Dr. Tuckey's first hockey season go?

What did you think about competing in a Women's beginner hockey league for the first time?

What did you think about your performance in this league?

What support did you receive from family/friends surrounding your first season?

Qualitative Results

What did you think about competing in a Women's beginner hockey league for the first time?

*"I was so **excited**! I have a 'how hard can it be?' attitude and since I used to figure skate, I think it might be fun to try something new" – Player C*

*"My son is 9 years old and plays hockey, so after watching him play over the years, I've been **wanting to give it a try**." – Player K*

*"I was so nervous, I haven't been on skates since high school. I'm **looking forward to** getting into a sport once a week with some friends." – Player J*

Themes:

- **Excitement**
- **Curiosity**
- **Self-growth**

Qualitative Results

What did you think about your performance in this league?

*"I was **sad** when I didn't score in our first game and I saw other teammates get their first goal pucks. After I scored the second week I thought okay, now I'm part of the team and am **doing good**." – Player C*

*"I'm a big Leaf's fan, so playing has definitely given me a **new appreciation** of the sport, it's harder than it looks, but I'm still **proud of myself**." – Player K*

*"The first week I was **shaky** but I'm getting better at getting around on the ice and passing to other players, it's just **nice** to have a place to come to relieve stress." – Player J*

Themes:

- **Player evolution**

Qualitative Results

What support did you receive from family/friends surrounding your first season?

*"My parents were so **happy for me** to try something new. My dad gave me his **old hockey bag** that I'm using now." – Player C*

*"**My son comes** to every game, it's his favourite night of the week to come watch me play, then critique me the whole drive home. But I know it's coming from a place of him wanting me to be a good player." – Player K*

*"My family knows how stressful my work is, so they give me the hour once a week to **be with my friends** and relieve some stress." – Player J*

Themes:

- Support via equipment
- Support via attendance
- Support via mental health

Quantitative Research

Data-driven

Numbers & percentages

Concrete & objective

Qualitative Research

Design thinking

Quotes & feelings

Abstract & subjective

Quantitative Research

Dr. T's Average = 1.13 goals (16.98%)

Score Average = 6.63 goals

Data-driven

Numbers & percentages

Concrete & objective

Qualitative Research

*"I was so nervous, I haven't been on skates since high school. I'm **looking forward to** getting into a sport once a week with some friends." – Player J*

Design thinking

Quotes & feelings

Abstract & subjective

Quantitative Research

Strengths:

- Reliable
- Reproducible
- Statistical rigor for hypothesis testing

Qualitative Research

Strengths:

- Provides rich, context-dependent insights

Quantitative Research

Weaknesses:

- May oversimplify complex phenomena
- Limited depth in understanding
- May not capture subjective experiences

Qualitative Research

Weaknesses:

- Limited generalizability
- _____
- Time-consuming and resource-intensive

Quantitative Research

Claire's Average = 1.13 goals (16.98%)

Score Average = 6.63 goals

In Kinesiology,

Exercise Physiology, Biomechanics, and Motor Control

Use this method most often

Qualitative Research

*"I was so nervous, I haven't been on skates since high school. I'm **looking forward to** getting into a sport once a week with some friends." – Player J*

In Kinesiology,

Excersise Psychology

Use this method most often

Qualitative Results

What support did you receive from family/friends surrounding your first season?

*"My parents were so **happy for me** to try something new. My dad gave me his **old hockey bag** that I'm using now." – Player C*

*"**My son comes** to every game, it's his favourite night of the week to come watch me play, then critique me the whole drive home. But I know it's coming from a place of him wanting me to be a good player." – Player K*

*"My family knows how stressful my work is, so they give me the hour once a week to **be with my friends** and relieve some stress." – Player J*

Player	Type of Support	Emotional support	Practical Support	Time support	Social Support
C	Encouragement, equipment	1	1	0	0
K	Attendance, feedback	1	0	0	0
J	Time for stress relief	0	0	1	0
D	Attendance, stress relief	1	0	1	0
M	Equipment	0	1	0	0
S	Encouragement	1	0	0	0
L	Attendance, Equipment	1	1	0	0

Conclusions

What does this tell us?

- The choice between qualitative and quantitative research **depends on the research questions**, objectives, and the depth of understanding required
- Both offer valuable insights, and often, _____using both_____ **can provide a comprehensive perspective** on complex issues
- (Have both qualitative and quantitative methods in an experiment!)

September At-A-Glance

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1	2	3	4 Welcome	5	6
7 Tutorial #1 Primary Sources	8 History of Kinesiology & Online Library	9	10	11 Research Methods – Search Engines & APA Referencing	12	13
14 Tutorial #2 APA Referencing	15 Research Methods - Qualitative vs. Quantitative	16	17	18 Research Methods – Interpreting Results	19 Q vs Q Assignment Instructions Released 11:59PM	20
21 Tutorial #3 Research Questions	22 Research Methods – Knowledge Translation	23	24	25 Intro to Pillars of Kinesiology	26	27
28 Tutorial #4 Intro to Group Presentations	29 Biomechanics 1	30				

Up Next:

Tutorial #2

- Arrive to Tutorial #2 with a laptop/device to fully participate in class activities
- Tutorial will be related to last lecture's **APA Referencing content**

See you next Lecture!

Homework Before Next Lecture:

- Research Methods – Interpreting Results
- Read Wageh et al paper before next lecture – it will make your learning easier to follow along





Have a great day!

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