

Hypothetical Study Guidelines

Each group has been assigned one of the study topics listed below. The topics are somewhat general and it will be up to the group to generate a **specific** research question based on the existing literature in the area and the principles in the book that explain how to develop a research problem. Some specific research questions are suggested under each topic below.

- **Study 1: Hypnosis vs Imagery for Optimal Performance**

While not given as much scientific credit as imagery, hypnosis has been used to improve sport performance as well. Use the literature to answer some of the following questions in the build-up to your specific research question. How does hypnosis relate to sport psychology? How is hypnosis different from some of the more commonly used imagery techniques? How can hypnosis be used to improve the performance of athletes? Are some sports better suited for using hypnosis? Are there some clear limitations when looking at hypnosis studies versus imagery studies?

- **Study 2: Do Certain Movement Patterns Produce More Consistent Results**

While this question applies to many sport skills, golf putting is particularly interesting. A specific set of four variables, under the control of the golfer, can be identified as the main deterministic factors in the outcome of a putt: face angle, stroke path, putter speed, and impact spot. At the moment of ball contact, these variables primarily determine the initial speed and direction of the ball. The human body has numerous degrees of freedom (anatomical movements at each joint) and a golfer can use almost an infinite combination of these to swing the putter and generate the impact conditions necessary to hole a putt. For example, the golfer could “freeze” all joints from the back through to the putter and just rotate the pelvis to hit a putt. Or, a golfer could move all joints from the hips through to the wrist and generate the same impact conditions between the putter head and ball as the ‘torso only’ swing. Will a certain movement pattern produce more consistent impact conditions than any other? Please see work by Latash, Newell, and Nikolai Bernstein.

- **Study 3: Using Weighted Implements to Improve Clubhead Speed in Golf**

Weighted (modified lighter and heavier) implement training has been used by former Soviet Union researchers and strength coaches in track and field for decades. The Soviets modified their field event implements, such as the hammer, shot put, javelin, and discus. These weighted implements were used specifically in their specialized speed strength (power) training programs. The idea behind underweighted training for the track and field athletes was that their body segments would move at higher speeds with less muscle force generated because lighter than normal implements were thrown. On the other hand, the reason for using overweighted training for these athletes was that body segments would move at slower speeds with greater muscle force generated because heavier than normal implements were thrown. This same principle has been applied in baseball. **Does training with slightly heavier and slightly lighter golf clubs increase clubhead speed?** Be sure to include information on theories regarding the underlying mechanisms for improvement when using light versus heavy implements. For example, we know that endurance running training increases the oxygen carry capacity of blood, while lifting heavy weights increase the size of individual muscle fibers, which allows them to produce more force.

- Study 4: Training to Improve Vertical Jump**

What is the best training method for improving the vertical jump of female volleyball players? Squats, plyometrics, Olympic lifts? Does the optimal training method depend on the current fitness level, such as leg strength, of the athlete? Should several training methods be used simultaneously? Should athletes progress in sequence from one type of training to another? How many times per week should the training take place? Does it matter if the athlete is in season or out of season? How much improvement in the vertical jump should a female volleyball player expect to see following a year of optimal training?
- Study 5: Training to Improve Sprinting Speed**

What is the best training method for improving the sprinting speed of a track athlete? Squats, plyometrics, Olympic lifts? Does the optimal training method depend on the current fitness level, such as leg strength, of the athlete? Should several training methods be used simultaneously? Should athletes progress in sequence from one type of training to another? How many times per week should the training take place? Does it matter if the athlete is in season or out of season? How much improvement in sprinting speed should an athlete expect to see following a year of optimal training?
- Study 6: Strength Straining for Distance Runners**

Should elite distance runners (e.g. 5 – 10 km) engage in strength training or explosive type training to improve their running times or will this type of training conflict with their endurance type workouts and result in a reduced aerobic capacity? If strength and explosive type training is beneficial, then how should it be incorporated into their weekly schedule of endurance training? What percentage of training time should be spent on this type of training? At what percentage of their 1 RM should they be lifting weights? What about plyometrics? If strength and explosive type training is beneficial, then what is the theoretical reasoning, from both a biomechanical and muscle physiology perspective, behind improved performance?
- Study 7: Training to Improve Agility**

Agility is common term associated with performance in most sports. Everyone has general idea of what it means to be “agile”, yet this variable is not well defined from a technical standpoint. Other traits such as speed, strength, flexibility, and endurance are more easily defined, tested, and perhaps it is even more evident how to train these characteristics of an athlete. Several questions should be addressed: Is agility a separate characteristic? Or is it a combination of several bio motor abilities? How do we test it? Does that match how we train it? For example, agility ladder drills are among the most common for training agility (hence the name), while the most common test of agility is the T-Test. If an athlete wanted to improve his or her T-Test score, would agility ladder drills be the most advisable?
- Study 8: Dynamic Balance and Dynamic Stability in Sporting Movements**

What is the difference between balance and stability? What is the difference between dynamic balance and static balance? What is the difference between dynamic stability and static stability? Are any of these important in executing sporting skills such as a golf swing? How do you measure these attributes? How do you train these attributes?

- **Study 9: Practice Methods to Improve Consistency**

In skills like darts, bowling, free throw shooting, and approach shots in golf it is important to develop a repeatable and predictable outcome. Approach shots in golf are particularly interesting because the environment and exact shot required does vary somewhat between attempts. In golf approach shots, the distance will vary requiring a different club to be used. The wind, temperature, ground firmness, and stance will also influence execution. A golfer's dispersion from a particular distance is highly correlated with their scoring average (handicap). Dispersion refers to the distribution (area) of a large number of shots around a particular target (the hole). Good golfers will have smaller dispersions and those dispersions will be centered on the target. What is the best way for a golfer to practice to improve (reduce) their approach shot dispersion? For example, should they use block or random practice? Does the best practice method depend on the golfer's current skill?

Outline of Literature Review

Each group will hand in a one to two page outline of the proposed structure of their literature review. This will include numbered topics for each paragraph. Under each topic heading will be several sub points that will be covered in the paragraph. For example, below is an outline for 2 paragraphs. You should have at least four paragraphs outlined. In addition, include an outline for an introduction paragraph and a purpose statement paragraph. Their order of appearance should also be logical.

1. Physical activity has previously been shown to prevent bone atrophy
 - a. Describe results from bed rest studies in which the participants that exercised in bed did not lose bone mass
 - b. Include results that show bone density is maintained in elderly who are physically active.
 - c. Including resistance exercises during space missions has had positive results on the rate of bone loss.
2. Bones require a certain type of stimulus in order to be maintained.
 - a. Talk about rat study that showed how a constant force on the bone did not maintain bone strength.
 - b. Mention how osteoblast production is stepped up when forces are applied to a bone at frequencies between 20 and 60 Hz.
 - c. Try to find a study that shows elite swimmers have less dense bones than elite power lifters despite the fact that they spend more time exercising each week.

Include a title page similar to the Article Summary which includes your Group #, the names of all group members, and a tentative title for your study.

Include a Reference list (single spaced in APA format) of **all** potentially relevant articles, books, etc. that you *might* use in your final paper. This can easily be completed using your RefWorks account. Step 1: Use the Share feature to create a master list of all of your group's RefWorks references pertaining to your project. Step 2: Delete any duplicate entries. Step 3: Create and print a bibliography in APA format.

I would suggest the following method for your Group's outline preparation. During the month of September, each group member should collect at least 10 articles pertaining to the study topic. Based on these articles, each member should independently generate a complete outline. A meeting should then occur to choose the best combination of outlined paragraphs. A final Group outline can then be determined. A good outline will likely require the retrieval of additional articles to support ideas. See point 2c in my example above. During the final two weeks in October, these additional articles should be acquired.

Note: When the final project is due, I require full-text electronic copies of each cited article. Therefore, as you find electronic articles, you should save the pdf files on your H: drive, W: drive, or on a jump drive with the following naming convention:

**Last Name of the first Author – Year – Title, e.g.
MacKenzie – 2007 – The effect of creatine on bicep strength**

Literature Review/Statement of Problem and Hypotheses

The completed document thus far should not exceed 10 pages double-spaced using Times New Roman 12 pt font and one inch margins. A minimum of 20 articles should be included in your literature review. At least four articles should be published after within the past five years. Only pertinent information pertaining to those articles that flows with your writing should be included. Do not simply write summaries of each article. See the sample "Literature Review". Your writing should, but not necessarily, follow the **Outline of Literature Review** previously passed in. The purpose of the outline was to make writing the actual literature review easier. All articles must be selected from reputable peer-reviewed journals. Academic text books are also suitable, but consider that even new books might not contain the most recent advancement in research. Other sources can be used to demonstrate popular opinion, but should not be used to state fact. A Statement of the Problem and Hypotheses should be included. One document should be submitted per group. Appended to this document should be a reference list (APA style). Include your group #, names, and the title of your study on the front page of this document. For further information on writing this document, please refer to Chapter 2 in the text. The document should be written in future tense. "The purpose of the proposed study is to investigate..." Sample **Literature Reviews** have been posted. One specifically demonstrates the correct formatting, and two provide guidelines for content. You are expected to follow the style of the sample literature review in close detail (e.g., title page, running header, page number, etc.). Please adhere to the information provided in the following links.

- APA style <http://guides.lib.monash.edu/content.php?pid=346637&sid=2835402>
- Grammar and spelling <http://owl.english.purdue.edu/owl/section/1/5/>
- Writing numbers [Writing Numbers and Statistics](#)
- Semicolons <http://writing.wisc.edu/Handbook/Semicolons.html>

Methods

Use a Methods section from a research study that is similar to your own as a template for creating your own methods section. However, please include as many original ideas as you possibly can. Include a sketch of your experimental set-up. This could include a sketch using the Drawing Canvas in Microsoft Word, or some other graphics software. It is also

acceptable to draw the sketch by hand on plain white printer paper and scan it into a digital file. It is also possible to simulate your experimental set-up in real life and take pictures with a digital camera. Please include an APA reference list for any citations made in your Methods section. Include your group # and the title of your study on the front page of this document. The document should be written in future tense. “Subjects *will be* recruited from Human Kinetics classes...”

Results

The group with the study number that is one less than yours will generate the raw data for your group’s study. This will happen in November (see course web page). On that day, a representative from your group will email an Excel file to a representative from the next lowest group number (eg., 2 -> 1, 1->9). A paragraph that explains the type of data required should accompany the file.

Example of what you should send to, and receive from, another group:

The purpose of the study was to determine if plyometric training is better for improving vertical jump than standard squat training. There were a total of 60 subjects participating in the study. The subjects were randomly assigned to one of three groups equal in number. There was a control group, a plyometric training group, and a squat training group. Each subject had their vertical jump (cm) measured once before the training period and once after the training period. We expect the control group to have the same pre and post test scores with a mean of 60 cm and a standard deviation of 5 cm. The plyometric group - pre: 60 ± 5 cm and post: 72 ± 6 cm. The squat group – pre: 60 ± 5 and post 65 ± 6 cm.

Subject	Control Group		Plyometric Group		Squat Group	
	Pre-Test	Post-Test	Pre-Test	Post-Test	Pre-Test	Post-Test
1						
2						
3						
4						
...20						

After receiving the raw data, you will conduct the appropriate statistical analysis and present your results as suggested in the book, in class, or based on a representative research article that had a similar study design. Please note the following when writing out your statistical findings: [Writing Numbers and Statistics](#)

Discussion

In one or two pages, try to explain the results in context with other research and existing theories. Although your findings are based on simulated data, your explanations should be plausible. Near the end of your discussion, you should describe future research that should be conducted based on your findings.

References

A reference list should be attached to the final document and written using the APA format. **All your pdf files should be saved to a jump drive.** See Final Paper section below.

Final Paper

The final paper is to be emailed to the class gmail account, handed in as a printed hard copy as well as handed in on a USB stick. **Also on that USB stick should be the full PDF version of every article referenced in the paper. Each PDF paper should be saved with the following naming convention.**

Last Name of the first Author – Year – Title, e.g.

MacKenzie – 2007 – The effect of creatine on bicep strength

Also on the USB stick should be a copy of your outline, Excel spreadsheets, and SPSS documents. I also require the original copies of the Lit Review and Methods sections that you will have previously handed in, and I, will have subsequently handed back with comments. All of the printed documents and USB stick should be contained within a sealed envelope with your Group #, study title, and group members written on the outside.

The final paper should be written in past tense. This means that you must change the tense in your literature review and methods section. For example “The purpose *was to...*, Subjects *were recruited...*”

Peer Evaluation

For the peer evaluation, each member of your group should write down a number out of 100 for each person in your group on a sheet of paper. Fold the paper several times but please do not staple it. Each person in the group should add their own sheet to your group project envelope.

Combined, all of the Hypothetical Study components are worth 350 points. Each member will also have an average peer evaluation based on their rating from other group members. This average rating will then be applied to the group mark, resulting in distinct marks for each group member. Suppose Bob, Joe, Ann, and Joy are in a group and the total for all their Hypothetical Study components sums to 200 pts. I then apply their peer evaluations to determine the final mark. For example, Bob was given marks of 70, 75, and 80 by his group members. This resulted in an average mark of 75. Therefore, his final mark for all components of the Hypothetical Study was 150 pts. Please note that your peer evaluation represents the percentage of the true group mark you feel your fellow group member deserves. If your group shares the workload, then I fully expect each member will have a "Peer Average" very close to 100. However, if one group member contributes next to nothing, and this lack of effort is perceived similarly among all other group members, then they will not share in the group's success.

Bob	Joe	Ann	Joy	Peer	Prof	Final
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				Average	Mark	Mark	
Bob		70	75	80	75	200	$.75(200) = \mathbf{150 \text{ pts}}$
Joe	90		90	90	90	200	$.90(200) = \mathbf{180 \text{ pts}}$
Ann	100	100		100	100	200	$1.0(200) = \mathbf{200 \text{ pts}}$
Joy	100	90	95		95	200	$.95(200) = \mathbf{190 \text{ pts}}$