Lab in Human Cognition, Fall 2012

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In Preparation for Writing a Lab Report

(Note: The bulk of the information in this handout can be found in Daryl Bem's "Writing The Empirical Journal Article" or the APA PUBLICATION MANUAL)

APA MANUSCRIPT FORMAT: (See Sample Lab for Title Page format, Section Headings, Headers, etc…). Make sure that you turn in all drafts in proper APA Manuscript Format.

- Your **RUNNING HEAD** should be an abbreviated version of your title (no more than 50 characters, including spaces). Only include the words "Running Head:" on your title page.
- Place your complete title on the first page of your introduction. Do not write "INTRODUCTION" as a heading for this section. All other section headings should be bold and centered. Sub-section headings appear on the left in bold. Review the APA Manuscript guide I handed out in the last workshop.

Writing Your Abstract

The last section you will write will be the first one your readers will encounter; it is also arguably the most important paragraph of your entire report. Many researchers, in fact, will carefully read only the Abstract of a paper, skimming the rest of the sections. For this reason, your abstract needs to be compact, full of essential information, organized, and self-contained, as seen in Heilman et al. (2010):

A study investigated how anticipated communication mode affects the use of stereotypes in forming impressions and making task assignments. Participants rated male or female targets with whom they envisioned working on a business project using computer-mediated or face-to-face modes of communication. Results indicated that both men and women were characterized more stereotypically when participants anticipated working with them electronically than when they anticipated working with them face-to-face. Furthermore, task assignments were more often gender stereotype consistent when the communication mode was computer-mediated than when it was face-to-face. These findings suggest that the mere anticipation of computer-mediated communication, without the actual the experience of it, is enough to promote stereotypes and biased decision-making.

You should define all abbreviations, terms, and acronyms in your abstract; spell out all names of tests. If your study extends or replicates previous research, state this in your abstract. Include names of authors and dates of publication and paraphrase (do not quote) past research in your abstract. Do not include information in your abstract that does not appear in the body of your paper.

Try to keep your abstract less than 120 words. It should contain:

- The problem under investigation (in one sentence, ideally)
- The participants (including any pertinent information about their characteristics, such as number, type, age, sex. . .etc)
- The experimental method, including data gathering procedures and complete test names.
- The Results
- The Conclusion (larger implications of your research)

Writing the Introduction Section

The Introduction of an empirical journal article should identify a particular research problem and explain how previous researchers have investigated this issue. The ordering of information in this section is crucial. You might be tempted, for example, to mention your own research (or even your hypothesis) early in this section; however, you must first adequately introduce your research question, present us with a relevant literature associated with this question, and state a gap in the previous research before you mention your own experiment for the first time.

THE OPENING PARAGRAPH

Whenever possible, try to open with a statement about human behavior instead of a psychological theory. Your instincts might push you to begin too broadly, offering the reader abstract generalizations that could begin *any* article. Here is a bad (overly broad) example: "*For years, sociologists and psychologists have conducted studies on cognitive development or the construction of human thought or mental processes.*"

Instead of relying on abstract, broad generalizations about *society* or *humankind*, consider offering the reader a real life example, hypothetical situation, or historical event to illustrate a theoretical issue. Here are four examples of strong opening statements from student papers that successfully introduce their areas of research:

EXAMPLE ONE (Banks et al., 2009): On March 13, 1964, Kitty Genovese was stabbed to death 17 times and then sexually assaulted while roughly 38 witnesses heard her cries and looked on from their windows. It wasn't until about a half hour later that one witness called the police, and by then it was too late. Six years later, this phenomenon was explored by Bibb Latane and John Darley (1968). They found that the sheer presence of other bystanders decreases a person's likelihood of intervening in a situation. This "Bystander Effect" is defined as the tendency for a person to be less likely to provide help when there are others present. The presence of other bystanders also decreases the chances of anyone noticing the incident, interpreting the incident accurately, or assuming responsibility. . . .

EXAMPLE TWO (Kozman 2010): Imagine that you are walking down the street on the way to class. Just like countless other days, you pass a man on the corner handing out coupons, and just like other days, you ignore him completely as you head down the sidewalk. A few blocks further down there is another man handing out coupons. A moment later, you have a flyer in your hand, though you have no idea why you chose to accept this one. The two men were alike in almost every way—their gender, age, height,

attractiveness, and clothing – so what caused the sudden change of heart? What causes us to become more receptive in these types of encounters? According to Andersen, Guerrero, Buller & Jorgensen (1998), one main component is nonverbal immediacy, which encompasses cues that signal the availability of the initiator. These nonverbal signals, whether conscious or unconscious, can elicit an approach/avoidance response in other individuals, depending on the nature of the non-verbal communication. Cues such as close proximity, erect posture, gaze and smiling signal that the person is available and friendly (Andersen, 1985).

EXAMPLE THREE (Stern, Bonnelly, & Vivar, 2010): In an interview for Golf Digest, Tiger Woods was asked how his parents had assisted him in reaching his goal of becoming a professional golfer. The iconic athlete's response that his father's coaching had aided him surprised no one, but his selection of Buddhism as his mother's contribution baffled the interviewer at first. To clarify, Woods explained that its teachings of emotional control allowed him to "calm [him]self down and use [his] mind as [his] main asset." Certainly Woods' natural golf skills are vital to his success, but can maintaining mastery of his negative emotional reactions be just as influential in aiding him to reach his goals? In order for Tiger Woods to ever achieve another future goal, he would first need to form basic goal intentions. These intentions are defined as instructions that people create in order to perform a specific behavior and achieve a desired outcome. They take the general form of "I want to achieve X!" where "X" is the specified outcome (e.g., "I want to win today's golf match!"). However, the creation of a goal intention does not necessarily initiate the vital process of striving towards that goal. This problem becomes a considerable roadblock to eventual goal achievement (Heckhausen & Gollwitzer, 1987).

EXAMPLE 4 (Duncan, 2010): Have you ever tried to focus your attention on reading the newspaper, yet inexplicably found yourself listening to someone's conversation instead? Have you recalled the slogan from a billboard you passed on the street without realizing you had even read it in the first place? Whether you like it or not, you may not be able to consciously control what you pay attention to. In fact, the concept of cognitive interference, or conflict between targets you *consciously* attend to and the targets you *automatically* attend to, plays a huge role in the study of cognitive processing. One of the primary psychological phenomena used to study interference in cognitive processing is the Stroop Effect. The Stroop Effect was first analyzed by J. Ridley Stroop in 1935 and is used to describe interference between simultaneous, sometimes conflicting mental tasks. The classic Stroop experiment involves the presentation of a list of colors written in either the same color ink as the color word represents (i.e. the word red written in the color red) or in an ink color different from what the color word represents (i.e. the word yellow written in the color green). In general, participants are fastest at saying the color of the written word when the word and color of the ink match up and slower when the two are incongruent.

Each of these examples first gets the reader's attention with a specific situation or image before transitioning into an overview of the larger research problem. Notice how the writers use examples to illustrate theoretical points or to introduce unfamiliar conceptual or technical terms. The more abstract the material, the more important such examples become. These examples are also successful at defining their terms and concepts (Bystander Effect, implementation intentions, nonverbal immediacy, Stroop Effect). As you lay the groundwork for your own experiment, refrain from using scientific terms before defining them first. Consider your audience: your parents (assuming your parents are not psychologists) should be able to understand the concepts introduced in this section.

PREVIOUS LITERATURE RELATED TO YOUR TOPIC

In this section of your Introduction, you should present the reader with an account of the relevant literature associated with this topic. Citing research shows the reader that

the field considers your topic to be important and establishes how your work fits into existing work. You should determine the most logical order for introducing the relevant literature (as you move from a BROAD place to your SPECIFIC area of interest). Try not to begin paragraphs with a new study in this portion of your Introduction. Create smooth transitions that allow the reader to understand how you are making sense of previous research. We should be able to follow your logic as you approach the GAP in previous research.

For example, here is an excerpt from the Introduction of Heilman et al. (2010), a study that investigates the effects of computer-mediated communication on gender stereotyping:

There have been several explanations for these findings. Social presence theory posits that interactions that are not face-to-face impart a reduced sense of ''social presence," or awareness of the other as a real person (Short, 1974; Short, Williams, & Christie,1976). The cuelessness model (Rutter & Stephenson, 1979) argues that the lack of social cues inherent in communication that is not face-to-face results in depersonalization. Other theories have suggested that the anonymity inherent in electronic communication is responsible for deindividuation (Kiesler et al., 1984) and greater stereotyping. The more comprehensive social identity model of deindividuation effects (SIDE) builds upon this idea, but also draws upon social identity (Tajfel & Turner, 1986) and self-categorization theories (Turner, Hogg, Oakes, Reicher, & Wetherell, 1987) to argue that the anonymity of CMC causes perceivers to become more sensitive to group membership cues (Reicher, Spears, & Postmes,1995; Spears & Lea, 1992).

Observe how much information is presented in such a concise passage. The authors manage to represent eight studies in a single paragraph, providing readers with an accurate overview of how research about CMC interactions has evolved since the mid-1970s.

When you begin to select the studies that will be mentioned in your Introduction, you will want to identify the ones that are most closely related to your particular area of interest. Try to convey the key points of an article in no more than 2 sentences. You are essentially telling "the story" of all past research on this topic.

A note about citations: The standard journal format permits you to cite authors in the text either by enclosing their last names and the year of publication in parentheses, as seen in throughout the example above, or by integrating their names directly in the sentence, as seen in this example:

According to Andersen, Guerrero, Buller & Jorgensen (1998), one main component is nonverbal immediacy, which encompasses cues that signal the availability of the initiator.

IDENTIFY THE GAP IN PREVIOUS RESEARCH

Throughout your Introduction, you must craft logical transitions, making it clear how different findings relate to each other. Eventually, make it clear how the past research relates to your study. After effectively laying the groundwork for this discussion, your next task is to identify a *gap* in the previous literature— a question that previous

research never asked. In other words: why does this study need to exist? What has been left out of this body of research? Why is this research different? How does your experiment depart from or clarify past research?

Observe how the following paragraph from Heilman et al. answers these questions:

These explanations all share the common assumption that the experience of CMC promotes stereotyping—that the physical properties and design features of CMC produce its social effects. In contrast, we believe that the effect of CMC on impression formation, and in particular the use of stereotypes in other-perception, is not necessarily dependent on actually communicating via computer or even being present in the CMC situation. Instead, we propose that when individuals know that they are going to be using an electronic rather than a face-to-face communication mode, they recognize that they are going to be visually anonymous and their interactions highly ambiguous.

While Heilman et al. have identified a definite gap in the previous literature, you might find that your study is more of an attempt to replicate a past study's findings. Your aim might be to repeat a past experiment with one or two key modifications, as is the case in Chiu (2010):

Despite the deceleration in word processing in Dunbar and MacLeod (1984), the Stroop effect still occurred; word processing interfered with color processing. Therefore, the serial account of the horse race model is not a viable explanation of the Stroop effect. In the current study, which is based on the original Stroop (1935) task as well as the Dunbar and MacLeod (1984) follow-up, participants viewed color words presented in the normal upright position or in an upside-down position and identified either the word itself or the font color. The trials varied in the congruency of word and font color.

Note: before this point in the Introduction, you SHOULD NOT mention your own study

PROVIDE A BRIEF OVERVIEW OF YOUR METHOD

After clarifying the gap in previous research, describe your own study's focus, followed by a brief overview of the Method. Usually, this step can be accomplished in 1-2 sentences, leaving more specific details for the Method section of the report:

In the current study, we aim to build on the findings of Magen et al. (2008) and Vohs et al. (2008) to discover if cognitive exhaustion will result in increased temporal discounting. Participants will complete either a difficult test, intended to greatly deplete cognitive resources, or an easy test, intended to minimally drain cognitive resources. Then they will engage in the cognitive decision-making task of temporal discounting, as opposed to Vohs et al.'s (2008) use of behavioral measures of self-control and impulsivity.

STATE YOUR HYPOTHESIS

Finally, the Introduction ends with a clear statement of the hypothesis, followed by a rationale for this proposed explanation. Note that you **can** use the first person ("I hypothesize," or if you are working in a group, "We hypothesize").

We hypothesize that participants will be more receptive with eye contact or verbal contact than with no eye contact or verbal contact, and that this effect will be strongest when both forms of contact are present simultaneously.

Unless the rationale for your hypothesis has already been explained earlier in your Introduction, you will need to convince your reader that this proposed explanation is reasonable given your knowledge of this research topic:

Writing the Method Section

For your preliminary labs, your Method sections will usually be composed of three sub-sections: *Participants and Design* (including information regarding number, age, race, and gender, if relevant); *Procedure* (the conditions under which the participants were tested, complete with all the necessary information required to replicate the experiment's design); and *Materials* to describe the questionnaires and computer program used in your study.

A note on verb tense: Generally speaking, you should use past tense in your Introduction, Method, and Results sections. You can switch to present tense when you discuss the larger implications of the results of your research, particularly in the middle and late portions of the Discussion section.

In "Writing the Empirical Journal Article," Daryl Bem reminds us to "name all groups, variables, and operations with easily recognized and remembered labels. Do not use abbreviations (the AMT5% group) or empty labels (Treatment 3). Instead, tell us about the success group and the failure group, the father-watching condition and the mother-watching condition, the teacher sample and the student sample, and so forth."

PARTICIPANTS AND DESIGN

In this sub-section, you should describe your participants' age, number, gender, and race (if it's relevant). You should also mention how they were approached. Here is a strong example from a student paper (Kozman 2010):

Participants were male and female pedestrians (N=80) in New York City who were walking alone and were physically able to experience the visual and auditory manipulations and accept a leaflet; we therefore restricted participants to sighted individuals not talking on a cell phone, not listening to a music player and not carrying items in both hands. The ages, races and ethnicities of the participants were diverse and representative of the New York City pedestrian population.

OR from Chiu (2010):

Fourteen students, both men and women, taking an undergraduate-level Lab in Human Cognition class at New York University participated in the current study. Half of the participants were randomly assigned to the recognition-first condition and took the recognition test first, while the

other half were assigned to the recall-first condition and took the recall test first. For the purpose of counter-balancing, the two groups were exactly the same and differed only in the order in which they took the tests.

Note the correct format for describing the **design** (*eye contact* and *verbal contact* are the two independent variables in this study):

We assigned participants into four groups (n=20) in a 2 (Eye Contact/No Eye Contact) x 2 (Verbal Contact/No Verbal Contact) experimental design, running all four conditions back-to-back.

PROCEDURE

One important job of the Method section is to lead readers through the experiment so that they can reproduce it themselves. Make sure your Procedure sub-section adequately provides all the necessary information required to replicate your design. That said, you will need to strike a balance between providing too much detail and not enough information. Extraneous details that are unrelated to your study's design should be omitted. For example, if you are providing details about your materials that have absolutely no bearing on the results, you are crossing the line into "TMI" (Too Much Information) territory.

In general, APA strongly advises against using the passive voice; this guideline is particularly important in this sub-section. Active sentences are more direct and leave no room for ambiguity; in the active voice, we always know *who* is performing a particular action.

Poor wording / Passive Voice: Participants *were given* a survey and *were then told* to complete it.

Active Voice: Participants *completed* a survey.

MATERIALS

This sub-section is particularly useful when you employ a questionnaire. You should address the following questions: How many items comprised your questionnaire? What was the format? (For example: "The questionnaire began with questions measuring X and ended with questions measuring Y; ended with two open-ended questions about Z and five demographic questions. . .etc. . ."). At the end, write in parentheses: (See Appendix for questionnaire). Include your full questionnaire (exactly as the participants saw it) in the Appendix.

Writing the Results Section

A strong Results section designs a logical order for a study's findings. The most important results should be told first, followed by the next most important, and so on. In essence, the overall story of the Results section should be deliberately and logically

designed. This design will prevent readers from getting lost in a series of statistics and will enable a reader less familiar with Psychology's vocabulary to garner an overview of the study's key findings.

You should "set the stage" before you present the actual results. Present any preliminary analyses (e.g., manipulation checks; general descriptive statistics) you conducted and how you did so:

We analyzed all data by two-way analyses of variance with sex of participant and mood induction as the independent variables.

Always tell the story of the results in plain English first; then provide the statistical evidence. By doing so, you will save your reader time and energy. We shouldn't need to read through an entire paragraph of statistics to get to the story of what they show. Early on in your Results section, you should clearly address your research question in plain English:

We analyzed all data using chi-square analyses, with eye contact and verbal contact as the independent variables, and found that participants were receptive if either form of contact occurred, but not if both were absent.

When discussing the results related to particular items on your questionnaires, remember Bem's advice: don't refer to your questions as "Question 11," but always talk about the content of the item (for example, "drink frequency item" or "course satisfaction item" or "healthy eating item").

REPORTING YOUR STATISTICS: A few guidelines

Reporting Means: Try not to just state means or statistics in their own sentence, but rather, include an explanation of those means or stats. Instead of writing, "The mean of the green group was 3.40 and the mean of the red group was 4.15," write: "The green group (M = 3.40) was less friendly than the red group (M = 4.15)."

Reporting a t-test: Before you talk about a statistical test, it helps to introduce the DV you're talking about (if you don't make it clear in that sentence) or what idea you are testing. Rather than writing, "The t-test was significant, p = .03", write: "A t-test revealed that the difference between the two groups was significant, $t(28) = 3.07$, p = .03." OR "The red group was significantly friendlier than the green group, $t(28) = 3.07$, p = .03."

Reporting a correlation coefficient: Include the correlation and significance (and explain what it means). For example: "If salary is associated with satisfaction only in those individuals working primarily for pay, we would expect correlations between salary and satisfaction in the pay group only. Indeed, a significant correlation between

salary and satisfaction was found in the working-for-pay condition, $r(55) = .43$, $p = .001$, but not for participants working primarily for experience, $r(55) = .06$, *ns*."

You have two options for reporting p-values. You can say that the p-value is less than .05 ($p < .05$), or you can provide an exact value ($p = .046$). If the output states that the significance level is .000, report it as $p < .001$.

Italicize all the statistical letters (*t, p, F, M, SD, r. . .)* but not the numbers around them.

Report the means and standard deviations for all significant results. Report the test statistic (*t*, *F*, *r*) for all results, regardless of significance.

When using an ANOVA, you will have a main effect test for each independent variable and an interaction test for every combination of independent variables. Example: for independent variables A and B, the ANOVA will produce a main effect for A, a main effect for B, and an interaction term AxB. This means you need to report three *F* tests and could potentially report, depending what is significant, three sets of means and standard deviations. For independent variables A, B, and C, the ANOVA will produce main effects for A, B, and C, and an interaction term for AxB, AxC, BxC, and AxBxC. This means you need to report seven *F* tests, and depending what is significant, up to seven sets of means and standard deviations.

A note about significance: Statistical *significance* means that the results were not likely due to chance, so never use the word "significant" outside of this context (as a synonym for *important*). Also, if you are going to talk about moderation and/or mediation, don't confuse the terms.

Writing the Discussion Section

This section is an opportunity for the authors to *interpret* their results and help the reader to see what the implications are, both theoretical and practical. A strong Discussion picks up right where the Introduction left off, by beginning with a clear statement of support or non-support for the hypothesis, followed by a brief reminder of the goal of the study (how it fills the current gap in the research). Next, you must interpret the results in a meaningful and responsible way, and then consider the implications of your findings. In other words, this section moves from the specific concerns of particular results to the more general concerns regarding the *implications* of the results. What inferences can be drawn from the findings?

A thoughtful Discussion will often provide possible shortcomings of the study's design and suggests opportunities for future research. Reading this portion of the Discussion in professional journals will be particularly useful for you as researchers, as you plan the design of your experiments. As you prepare your literature review, consider: what helpful advice have these authors provided for you about how to approach this specific

research problem? How can these limitations guide you to develop an improved design?

OPENING REMARKS OF YOUR DISCUSSION

Your first sentence needs to state whether or not your data support your hypothesis. To do so, you need to recall the hypothesis for your reader. For example:

The data collected supported only part of our hypothesis. As expected, the likelihood of helping was affected by group size. An individual was more likely to help than a member of a group.

INTERPRET YOUR RESULTS

In your Results section, you are offering the reader an organized glimpse of your data. In your Discussion section, you need to interpret those results in a meaningful and responsible way. The results do not "speak for themselves." Your job is to help the reader see the best and most valid interpretation of the results based on the current state of knowledge about the subject. Consider any important deviations or trends in your data, and develop a theory for why these anomalies might exist. Review the following example from Kozman (2010):

We did find a marginal main effect for verbal contact, but no main effect for eye contact. Furthermore, although we found an interaction effect between the two variables, it ran in a direction counter to our original hypothesis. While we expected the highest receptiveness to occur when both types of contact were present, we found that using either verbal contact or eye contact produced the same effects as using both types, while a markedly lower receptiveness occurred in the absence of both types of contact. Prior research has shown that these two types of exchanges can increase liking and the positivity of interactions. It makes sense intuitively that giving positive cues would increase the overall positivity of communications. However, this study highlights the detrimental effects of using neither verbal contact nor eye contact. Contrary to our hypothesis, verbal and non-verbal cues do not have an additive effect, but rather a subtractive effect; using no cues creates a lack of receptiveness. We can infer that *some* form of communication, be it verbal or non-verbal, is required in order to elicit receptiveness in a partner. This sharp drop in receptiveness in the absence of eye contact or verbal contact could indicate that the lack of these cues creates feelings of mistrust or dislike in the target. Alternatively, these results could mean that these negative feelings are present initially when approaching an interaction and are only assuaged by some form of positive contact. This trend may speak to an innately pessimistic tendency during initial interactions between people—this study suggests that perhaps we approach interactions in a closed-off, unreceptive state. When we receive some form of positive cue, such as eye contact or a greeting, we "warm up" to the individual, and we can infer from our results that only one such cue is necessary. However, if the partner gives no positive cues, we remain unreceptive to any information they may have. Contrary to our general intuition that we enter interactions with a neutral outlook that can be swayed in either direction, this study hints that perhaps we initially perceive others in a negative way, and that they must then overcome this through positive verbal and nonverbal cues.

LARGER IMPLICATIONS / RELATIONSHIP TO PAST RESEARCH

Next, consider the implications of the results. Help the reader to see how our understanding of the specific concepts might change based on the study and the results. After reviewing your own findings, explain to the reader what your study adds to the existing research. What inferences can be drawn from the findings? Do your findings

have any larger implications on race or gender? In the following excerpt, Heilman et al. (2010) consider the larger implications of the study's findings:

Because we focused on gender stereotypes, our findings have specific implications for women. Gender stereotypes carry presumptions of incompetence in gender-inconsistent arenas, and, although this affects men as well as women, the tasks and roles that typically are most respected and desired in achievement settings are those that are considered to be traditionally male. Female stereotypes feed the perception that women do not have the attributes required to perform successfully in these male gender-typed domains, and therefore limit women's access to them (Eagly & Karau, 2002;Heilman, 2001; Heilman & Parks-Stamm, 2007). Indeed, the pattern of gender-consistent task assignments evidenced in this study is illustrative of the potentially negative consequences of gender stereotypes for women in work situations. The fact that this response pattern was prompted by something as subtle, and as prevalent, as the anticipation of CMC is particularly troubling.

LIMITATIONS OF THE STUDY

After you have thoroughly explored the larger implications of your research, consider the possible shortcomings of your study's design. What factors (in or out of your control) helped to produce atypical findings? How did your participant pool, for example, influence the outcome of your results?

Be specific when you critique your study's limitations. If your study's participants were NYU students, how **specifically** might that limit generalizability? How do other people differ from university students, and how might those differences change your findings?

For example, it is weak to say: *"Because this study was done with NYU students, it would be important to replicate the findings with students at other universities in other parts of the country, as well as with people of different ages and socioeconomic backgrounds."*

Why? What if the study found that NYU students breathe air? Would we not believe that people in general breathe air, until we specifically repeated the study with students at other universities and other people?

The following example is a little stronger (but still not sufficient): *"This study found that people were more likely to offer help when we made eye contact with them first and when we were wearing pants as opposed to skirts. However, the participants were all people in New York City who might differ in their level of helpfulness from people in other parts of the country and the world."*

That might be true. But how would it change your results? If people elsewhere are more (or less) helpful, there might be a difference in the overall level of helping, but this does not mean there would be a difference in the effect of eye contact or the effect of pants versus skirts.

Consider this modified, superior example: *"This study found that eye contact made no difference in the probability of receiving help, but that people were more likely to help when we wore pants than skirts. However, the participants were all people in New York City, who generally avoid eye contact. Hence, eye contact might have made the hypothesized difference if the study were conducted in a place where people are less averse to making eye contact. Furthermore, the relatively young average age of our participants might mean that their attitude about*

pants versus skirts is rather extreme. Future research would be needed in order to conclude that people who wear pants are generally more likely to receive help than those who wear skirts."

The differences are clearly stated (New Yorkers avoid eye contact, young people might have more extreme attitudes) AND potential changes to the results are considered. You will, of course, not rely only on limitations relating to your study's participant pool.

OPPORTUNITIES FOR FUTURE RESEARCH / CLOSING REMARKS

Do not end your report by discussing the limitations of your design. Although addressing limitations is important, a discussion should also point to the possibilities of future work. Consider the questions that remain unanswered or that have been raised by the study itself, along with suggestions for the kinds of research that would help to answer them.

Don't just suggest replicating your study with people in different place, ages, etc. unless you give specific reasons why that would be important or why and how it might change the results. If possible, suggest future research that connects to the past research you reviewed in the intro.

End strongly, but modestly. Make a final point about why the study was important and why this area of research is worthy of future consideration. Returning one last time to Heilman et al. (2010), pay attention to the tone of the following passage; the authors strike a perfect balance between pure confidence (presenting themselves as experts in the field) and humility (recognizing the vast amount of work that still needs to be done in this area of research):

Despite the many questions yet to be addressed, this study's findings are clear in their implications. By demonstrating that the mere anticipation of CMC promoted stereotyping, they indicate that the effects of CMC can occur even when the actual amount of individuating information it provides is no different than that available in the face-to-face communication mode. The findings therefore suggest that the prevailing theories designed to explain reactions to CMC need to be re-examined and the role of perceptions more fully considered if we are to understand, and potentially affect, the impact of computer-mediated communication on impression formation.

Ultimately, you should strive to help your reader understand why your study was worth reading by offering a clear "take-away" message.

APA Style Rules for Numbers

- Spell out numbers under 10.
- Use figures (14, 233) to express numbers 10 and above.

• Use figures to express numbers under 10 that are grouped for comparison with figures 10 and above: *The results showed that 2 out of 20 recipients disagreed with the proposal.*
• Use figures and the percentage sign to represent percentages: *A significant majority, 62%, said they would support the fundraising campaign.*
EXCEPTION: Use the word "percentage" when a number is not given:
Researchers determined the percentage of rats…
• Dates, ages, and money are represented by figures:
2 weeks ago
She was a 2-year old.
The workers were paid $5 each.
• Common fractions are written out: *One fifth of the respondents…*
• Regardless of the rules above, numbers that begin sentences must be written out, but APA asks you to AVOID beginning sentences with numbers.

WRITING TICS TO AVOID:
"This" by itself as the subject of the sentence ("This is why…")
Overuse of It is / It seems that / There is/ There are / There was / There were
is that / is because / is what
Long sentences that exceed three lines (as well as….as well as…)
Overuse of transition words in every sentence
Shift in verb tense
Shift in person from singular to plural
Avoid "he/she" or "his/her."
Data. The word data is plural
Since versus *Because*: Since means "after that."
That versus *Which*: *That* clauses (called restrictive) are essential to the meaning of the sentence; *which* clauses (called nonrestrictive) merely add information. ("Dissonance theory, *which* has received major attention, is one of the theories *that* postulates a motivational process.")

APPENDIX A: TIPS FOR CREATING TABLES AND FIGURES

When it comes time to graph or visualize your results, make sure you are paying attention to all the interesting "stories" your data is revealing—not simply the "main" plotline. For instance, if we are looking at the relationship between age and public displays of affection (PDAs), and we have coded for a range of five different PDA behaviors (from handholding to passionate kissing) at two different times of day (morning and sunset), then we should explore not only the overall effect of age on PDA, but also the "stories" related to the range of behaviors and the time of day.

Each illustration should tell its own independent story, complete with Figure/Table # and an explanatory caption that tells us what the graph shows. Each axis should be

labeled with the measurement unit, and the accompanying text should refer to every figure by its number. Graphs should be clean and clear, without background lines or 3D effects unless the story calls for them.

Tables

- Tables can be used to present means and standard deviations, frequencies, correlations, and statistical analyses.
- According to the APA manual, tables should be used sparingly because they can be inconvenient for readers and expensive to publish.
- A table with only three numbers presents data that could be provided more conveniently in the text.
- If you use a table, you must refer to it in the text and indicate what will be found there. Ex: "Table 3 presents correlations." "Table 4 summarizes the results of the regression analysis." "Mean scores appear in Table 4."
- What do you include in the rows and columns? It depends. If you want to present more than one dependent measure in the same table, you should present the dependent measures in the rows and all independent variables in the columns. If there is only one dependent variable to present, one independent variable is presented as a row and the other as a column. Examples follow.
- APA style tables have horizontal lines separating each row, but they have no vertical lines separating columns.
- Tables end with a line spanning the last row of data. Under that line, you will find additional notes explaining abbreviations or symbols.
- Tables are placed at the end of the manuscript after the References section.

Figures

- All illustrations other than tables are called figures.
- Figures are used to illustrate patterns in your results.
- Unlike tables, their titles appear on a page of their own, entitled Figure Captions. All figure captions (but not table titles) appear on this one page, which comes before the figures themselves. All of this is found after any tables that you have included.
- If data was analyzed with ANOVA or chi-square, use a bar graph.
- If data was analyzed with correlation or regression, use a line graph.
- The independent variable should be plotted on the x-axis and the dependent variable on the y-axis.
- Use Excel instead of SPSS to graph your data.