# Writing an Empirical Research Paper[[1]](#footnote-1)

## Resources

* **Plunk’s “how to do APA” document:** <https://www.csun.edu/plunk/apa.pdf>
* **Plunk’s Word document already formatted for APA:** <https://www.csun.edu/plunk/documents/apa_template.docx>
* **A citation manager for your reference section:** <https://www.crossref.org/>
* Like all citation managers, there will be errors.
* Most errors involve using title case (i.e., all major words are capitalized) when it is supposed to be sentence case (i.e., only capitalize first word, proper nouns, and first word after a colon).
* Go to crossref.org 🡪 click where it says “search metadata” 🡪 paste/type in the title and hit search or return 🡪 click “Actions” 🡪 select “cite” 🡪 select APA 🡪 copy and paste special (unformatted text) into your paper. Then italicize the journal name and volume number.
* **CSBS Tutoring Center:** <https://www.csun.edu/social-behavioral-sciences/csbs-tutoring-center>
* Do not wait to take a whole paper to the center. If you wait until you have the whole paper, then you will only get limited help.
* Take each small section you complete to get feedback.
* **Writing Wizard Canvas Site** (Sunday through Thursday, 9 p.m. to 2 a.m.): <https://canvas.csun.edu/enroll/67WWNJ>
* **Center for Achievement in Psychological Sciences (CAPS)**: <https://www.csun.edu/social-behavioral-sciences/psychology/caps>

## Determine the Purpose of Research Paper

* **Contribute to knowledge and scholarship**
* **Test, develop, or apply theory**
* **Increase understanding of topic**
* **Enhance research methodology**
* **Help practitioners, program developers, counselors, policy makers, etc.**
* **Inform lay audiences**

## Components of an Empirical Paper

* **Introduction**
* **Answer the questions of “so what?” and “why is this study important?”**
* Example
* According to the Research on Offensive Animal Responses (ROAR, 2016), the costs of animal aggressiveness are of growing national concern. Aggressiveness by animals has gained national attention because of its link to missing limbs, increased PTSD by human victims, and increased anxiety in the forest (Cooper, Hofstadter, Koothrappali, & Wolowitz, 2007; Goodall, 1934; Tyson & Nye, 2017). Given the negative impact of animal aggressiveness on society, it is imperative to identify factors that relate to increased risk of animal aggressiveness.
* **Purpose of the study**
* Example
* The purposes of this study were to examine whether (1) there were significant differences between genders and animal types on animal aggressiveness, and (2) whether perceived size was significantly related to animal aggressiveness. The results of this study could potentially benefit researchers who study animal aggressiveness and also animal psychologists and zoo personnel who work with animals.
* **Review of literature**
* But it is more than a review of literature; it should justify and set up the variables to be studied.
* Examples
* **t-test example:** Research has consistently shown that gendered differences emerge in the study of animal aggressiveness (Hill, Fowler, & Rostenkowski, 2007; Wade, Cairney, & Pevalin, 2002). These gendered differences are quite plain to see; yet the difficulty comes in identifying why female animals are more aggressive than male animals. It may be that female animals are more likely to develop aggressiveness to protect their young and/or to feed their young (Centers for Control and Prevention of Disturbed Critters [CDC], 2017). Thus, it is not surprising that studies have found that female animals are at greater risk than male animals for aggression (Hill et al., 2003; Wade et al., 2002). These gendered differences even hold true across animal types (CDC, 2017). Hence, it was hypothesized that female animals would be significantly more aggressive than male animals.
* **ANOVA example:** Studies point to squirrels, especially female squirrels, as having the highest rates of aggressiveness of all animal types (CDC, 2017; Goodall, 1934). A study by Tyson and Nye (2017) found that aggressive acts towards humans in a one-year time period was highest among squirrels (12 documented attacks), followed by coyotes (9 documented attacks), wolves (6 documented attacks), and bears (3 documented attacks). It is likely that squirrels are more aggressive to make up for their cute demeanor and small size. Based on these studies, it was hypothesized that squirrels would be significantly more aggressive than coyotes, wolves, and bears.
* **Correlation example:** Size is considered one of the most important features in an aggressive nature (Lee & Abdul-Jabbar, 2017). Small size can lead to feelings of inadequacy, unworthiness, and deficiency (David & Goliath, 2017), and this view of self can influence how an animal reacts to confrontations with humans and other animals (CDC, 2017). Conversely, animals with large size may be more secure and confident in their ability to handle confrontations, and therefore may be less susceptible to resorting to aggression during confrontations (David & Goliath, 2017). Not surprisingly, research has demonstrated a strong inverse relationship between size and animal aggression (Cooper et al., 2007; Goodall, 1934). Hence, it was hypothesized that animals’ size would be significantly and negatively related to animals’ aggressiveness.
* **Research question(s) and/or hypotheses**
* **What is unique about this study? How does this study contribute to the literature?**
* **Resources**
* Baumeister, R. F., & Leary, M. R. (1997). Writing narrative literature reviews. *Review of General Psychology, 1*(3), 311–320. doi:10.1037/1089-2680.1.3.311
* **Methods/Methodology**
* **Procedures**
* Institutional Review Board (IRB) statement
* The information provided should be specific enough that other researchers could replicate the procedures.
* How were the data collected? What type of data? (e.g., self-report survey, interview, focus group, observation).
* The protocol for data collection should be described.
* What was the research design?
* What type of sampling procedures was used?
* What type of consent/assent was required?
* Where were the data collected?
* Who collected the data? Who coded and entered the data? Were additional procedures used to verify the accuracy of the data?
* Were the researchers trained? If so, how?
* What were the inclusionary/exclusionary criteria (i.e., criteria used to decide who could be included in the study and who should be excluded).
* Was there an incentive?
* Was any deception involved? Were participants debriefed?
* Example
* This cross-sectional, correlational study was approved by a university’s institutional review board prior to data collection. The data for this study were collected from 500 animals in one forest in a Southeast state. To participate, the animals had to self-identify as squirrels, coyotes, wolves, or bears. Only surveys that were complete (i.e., not partially eaten) were included in the data. Thus, analyses were conducted on data from 383 squirrels, coyotes, wolves, and bears. Undergraduate and graduate student research assistants (RAs) were trained by the principal investigator to collect the survey data in the natural habitat of the animals. After animals put their paw prints on the informed consent form, the RAs read the surveys to the animals and documented their responses. The animals were given as much time as needed to complete the survey, but most animals completed the study in approximately 8-10 minutes. The animals were given a $5 gift card for the local meat market for their participation. The surveys were taken back to a research lab to be coded, entered, and verified by trained RAs.
* **Sample characteristics**
* Who were the data collected from? Describe the sample.
* Sample size
* Generally, the following should be included: age range and mean, percent of male and female participants, and ethnic composition. Other demographics that are relevant to the study should be included. For example, if the study is on immigrants, then the number of years in the country would be helpful, as well as the percent from each country of origin.
* Example
* Of the 383 animals used for this study, the ages ranged from 4 to 16 years old (*M* = 6.5 years, *SD* = 4.1 years). In regard to gender, 47.1% were female animals, and 52.9% were male animals. Most (i.e., 70.2%) of the animals had at least one parent who emigrated from another forest. Specifically, the animals’ parents emigrated from 41 different forests. The majority (i.e., 94.5%) of the animals were born in the forest where the data were collected. Most (i.e., 60.5%) of the animals lived in packs, whereas 39.5% lived in solitary. In this sample, 25.5% were squirrels, 25.5% were coyotes, 24.5% were wolves, and 24.5% were bears.
* **Measures/Instrumentation**

Some authors have an overview of the statistical analyses in the methods section, while others include it in the results section.

* How were the variables measured?
* Multi-item scale
* First, have a sentence that states the number of items, the name of the measure (if relevant), what it measures, and the citation. If there is a stem or instructions to the scale, mention that here. Next, provide one or two sample items from the measure. The sample items will be in quotations marks. Next, provide the response choices and the values associated with the response choice. The actual response choice will be in italics (e.g., 1 = *strongly disagree*). If there are reverse-coded items, then mention how many were reverse-coded. Next, indicate how the score for the variable is calculated (e.g., averaged, summed, or some other method). Ideally, you should provide reliability or validity evidence for the scale here. And finally, provide information about the reliability of the scale using the current sample.
* **Aggressiveness.** The 20-item Growl and Bite scale was used to assess animal aggressiveness (Coyote & Runner, 1949). Animals were asked how often in the past week they felt a certain way. Two sample items were (a) “I always want to bite someone or something,” and (2) “I rarely howl, scream, or yell” (reverse coded). Five items were reverse-coded. The response options follow: 1 = *strongly disagree*, 2 = *disagree,* 3 = *slightly* *disagree*, 4 = *slightly* *agree*, 4 = *agree*, and 5 = *strongly agree*. The items were averaged to create a scale score with higher scores indicating more aggressiveness. The internal consistency reliability (i.e., Cronbach’s alpha) was .81 in the current sample.
* **Generalized anxiety.** The 8-item Cartoon Anxiety Test (CAT-8) was used to assess anxiety symptoms in the participants (Eeyore, Piglet, & Sadness, 2019). The items were prefaced by the following instruction: “Indicate how much you have felt the following during the last two weeks.” A sample item follows: “I kept thinking negative thoughts about something that might occur in the future.” The response choices follow: 1 = *rarely*, 2 = *sometimes*, 3 = *often*, and 4 = *all the time*. The scores for each item of the CAT-8 were averaged to create a scale score. A previous Cronbach’s alpha of .92 was found using a sample of 52% women and 48% men ages 18 and over (Eeyore et al., 2019). A Cronbach’s alpha of .88 was found in the current study.
* Single item indicator
* First, have a sentence that states that the variable was measured by a single-item measure, followed by the citation. Next, provide the actual item. Next, provide the response choices and the values associated with the response choice. The actual response choice will be in italics (e.g., 1 = *strongly disagree*). Ideally, you should provide reliability or validity evidence for the scale here.
* **Narcissism level.** A single item was used to the participants’ narcissism level (Zoolander, Beeblebrox, & Stifler, 2019). The item follows: “I am the most amazing person in the universe.” The response options ranged from 1-100 with two anchors: 1 = *does not describe me at all* and 100 = *describes me perfectly because I am perfect*. This single item indicator of narcissism correlated very highly with the 10-item “I Am So Famous Scale” (Lockhart & Burgundy, 2017).
* Observational variable
* Focus group / interview variable
* **Results/Findings**
* **What analyses were conducted and what were the results?**
* **Resources**
* Examples of writing results for t-tests, correlations, one-way ANOVA, regressions: <http://www.csun.edu/plunk/spss_tutorials.html>
* Reporting statistics in psychology: <http://evc-cit.info/psych018/Reporting_Statistics.pdf>
* Formatting tables in APA format: <http://people.oregonstate.edu/~acock/tables/>
* Analyzing focus group data: <http://research.apc.org/images/2/2f/A_Qualitative_Framework_for_Collecting_and_Analyzing_Data_in_Focus_Group_Research.pdf>
* **Discussion**
* **Restate the purpose of the study**
* **Did the results support the hypotheses? (completely, partially, not at all?)**
* **Discuss the findings**
* Why did the study find these results?
* Similar to past research?
* Does theory support the results?
* If different than previous studies, why?
* Discuss non-significant findings also.
* Example
* Consistent with previous research, animal size was strongly and inversely associated with aggressiveness (Lee & Abdul-Jabbar, 1972). Animals who have small size may feel deficient or inadequate (David & Goliath, 2017) and feel helpless, inadequate, and despair leading to increased risk of aggression (CDC, 2017; David & Goliath, 2017). Also, smaller animals may have to be more aggressive to fend off larger animals (Cooper et al., 2007). It should be noted that results might be different in samples that have more diversity in the sample. Thus, future studies should continue to examine the relationship between size and aggression in animals.
* **Limitations and research implications**
* What are the problems (i.e., design flaws) with the current study? Why are they flaws?
* What aspects of your research methods limit the external generalizability?
* Research implications – Based on the limitations, what are ways future studies can improve upon the current study?
* Example
* Certain limitations to this study should be acknowledged. The data in this study came from animals in one forest in a Southeastern state, which limits generalizability. Also, the age range of the animals was fairly limited. Thus, it is recommended that future studies should examine animals of different ages in varied geographic areas. Similarly, this study was limited in that the animals were not compared by forest of origin. Thus, the findings may not readily generalize to the range of diversity found among animals. Future studies may want to determine if animals from different types of forests relate to level of aggressiveness.
* When considering the present findings, readers are encouraged to recognize that lumping animals together into large groups does not consider possible intragroup differences. As an illustration, the sample of bears combined black bears, grizzly bears, and Winnie-the-pooh bears into one group. Similarly, the coyote sample was also very diverse. Hence, future studies may want to examine intragroup differences.
* **Implications**
* Implications for practice – How can results be used by practitioners, educators, and/or community activists?
* Implications for policymakers – how can policymakers use these results?
* Example
* Various prevention and intervention approaches are available to minimize negative thought processes due to small size and to decrease animals’ aggressiveness. For example, cognitive behavioral therapy (for a meta-analysis see CDC, 2017), psychotherapy (Tyson & Nye, 2017), and school-based approaches (David & Goliath, 2017) could help smaller animals (e.g., squirrels) get over their inferiority complex. Also, forest rangers and mentor animals could try to keep larger animals from feeding on smaller animals, which may, in turn, keep smaller animals from having to be so aggressive. And finally, smaller animals could be taught to use their voices to express their frustrations instead of resorting to aggression.
* **Conclusion**
* What point(s) does the author want to leave with the reader?

## What Should You Cite in Journal Articles?

* **In general, you should not cite from an introduction of an empirical research article.**
* The introduction is a compilation of results from previous research and/or application of theory from other sources.
* Thus, if you see something you want to cite, you need to go to the original source to make sure the other paper was cited correctly.
* Do not say, "(AUTHOR1, 2005 as cited in AUTHOR2, 2016)" - this is lazy! Look up the original article. This would only be acceptable if the AUTHOR1 is a classic book or article that you can not get access to.
* One exception – it is okay to cite a definition from an introduction.
* **You can cite the results in an empirical research article.**
* Unfortunately, the results can be challenging to interpret sometimes because the analyses are complex and the authors did not write for a lay audience.
* **Cite the discussion in an empirical research article.**
* Authors should summarize their key findings in the discussion in easier-to-interpret language. Thus, it is sometimes easier to figure out the findings from the discussion than the results section.
* Also, the authors should explain why they think they found what they found. This can give you the explanation you want to include in your own paper.
* **Cite the practice implications in an empirical research article.**
* When authors give implications for practice, this can be good to cite in your own paper when you are writing your own implications for practice.
* **If it is a review of literature article or a theoretical article, then you can pretty much cite from any part of the article.**
* For example, if the authors point out that many studies have found that A relates to B, you could say something like, “In a comprehensive review of literature, AUTHOR identified many studies that showed that A relates to B. They suggested this may be because blah blah blah.”
* You could also say something like, “According to AUTHOR, there is substantial evidence that A relates to B.”

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