

## RESEARCH PLAN PAPER

### SUMMARY:

The goal of research is to disseminate your work and allow it to guide further study. As such, writing is an important and ongoing part of the research process. Successful empirical writing minimizes descriptive or complex language so methodologies, conclusions, and theories are accessible to a diverse audience.

An empirical research paper has the following sections: title, author and affiliation, abstract, introduction, methods, results, discussion, and references. Your research plan will include 6 of these: **title, author and affiliation, introduction, methodology, predicted results and implications, and references.**

Empirical writing proceeds in an “hourglass” shape: introduce broad statements, narrow to specific methodologies, and conclusions, and then broaden again to discuss the general significance and implications of your work. Thus, the beginning of your paper and the end of your paper should contain your broadest statements, and the methods and predicted results should contain your most specific statements.

It is important to note that the introduction is an argument that sets the stage for your research question. It is not an exhaustive review of minutia research details.

Your research paper will be graded A-F and will act as the basis for your final poster. Below are detailed instructions along with example text. **You are expected to follow the instructions to the letter!**

### Title

A title should summarize the main idea of your research question. It should be a concise statement of the research topic and should identify the actual variables under investigation and the relationship between them. An example of a good title is “The Association between Gender and Treatment Seeking for Anxiety” or “The relationship between Risky Sexual Behavior and Risk for HIV”.

A title should also be fully explanatory when standing alone. You should avoid words that serve no useful purpose. For example, the words “method” and “results” do not normally appear in a title, nor should such redundancies as “A Study of” or “An Experimental Investigation of” begin a title. Also, do not use causal language, for example, “the impact of”, “the effect of”, etc. We are working with observational data for which causation cannot be directly evaluated. Finally, avoid using abbreviations in a title.

Model:

The Association between Smoking and Nicotine Dependence among Young Adult Smokers with and without Depression

Notice that I include the word “association” rather than effect. Another word that can be used in place of “association” is “relationship”.

I mention the sample, young adult smokers, only because I have subset a nationally representative sample of adults to those 18 to 25 year olds who smoked in the past year. Had I looked at a relationship such as the association between depression and smoking and used the whole data set, my title would have been “The Association between Depression and Smoking”. If I asked this question based on a data set where the sample included a specific age group (e.g. adolescents), an appropriate title would be “The Association between Depression and Smoking among Adolescents”.

Because I have a third variable as part of my question (i.e. depression), I note that I will be examining differences in the association between smoking and nicotine dependence among those with and without depression. If alternately, I was interested in how the association between depression and smoking differed based on one’s gender, my title would be “Gender Differences in the Association between Depression and Smoking”. If I were addressing this same question in a specific sample or population, my title might be “Gender Differences in the Association between Depression and Smoking among Adults with Cancer”.

Notice that “in”, “between”, “among”, “with”, “without”, etc. are NOT capitalized in the title. All nouns are capitalized.

### **Author and Affiliation**

Include your name and the affiliation that provided the context and support for your research.

Model:

Clare Smith  
QAC201  
Wesleyan University

### **Introduction**

The introduction summarizes the state of the field, describes the question you intend to investigate and how your research relates to other work in the field. It comprises a review of the literature. Each statement in the introduction should build to the justification of your own research by identifying a gap in existing scholarship. Statements should introduce and review your topic and rationale for study, and be

accessible to both non-specialists and specialists. A successful introduction gradually introduces your topic with examples from primary source literature.

In preparation for writing the introduction, you should have found and read at least 30 primary source articles, although only those that help provide important background and allow you to make an argument in support of your proposed research will be cited.

Never use quotes in the introduction. Everything should be simply paraphrased from primary source empirical articles that you have read.

Do not report what an author(s) thought or said. Objectively report what the author(s) found based on empirical research. The main evidence used in an empirical research paper is data. Opinions and paraphrased statements, even if they corroborate your claim, are not evidence unless accompanied by empirical results.

For your introduction, you should adhere to the following outline and include exactly 4 clear, thorough and concise paragraphs, one paragraph addressing each of the outline points below.

### **1. For your main topic of interest, why is it important? Why should we care?**

Model:

Despite recent increases in the administration of tobacco through smokeless products, cigarette smoking rates remain high with more than 15% of U.S. adults report current smoking (CDC, 2018). Smoking remains the leading cause of preventable diseases in the United States and is responsible for more than 480,000 deaths per year, including nearly 42,000 deaths from secondhand smoke exposure (U.S. Department of Health and Human Services, 2014). The most important factor believed to contribute to failed smoking cessation efforts is the level of dependence symptoms experienced by an individual. Nicotine dependence has been consistently implicated in the maintenance of smoking behavior as measured by self-reported smoking quantity and frequency (O'Loughlin et al., 2003; Shiffman & Sayette, 2005), failed quit attempts (DiFranza et al., 2007), and biochemical markers of nicotine exposure (Prokhorov et al., 2000).

Remember that the first few sentences of the introduction include the broadest statements of the paper. In some cases, evidence for these broad statements are more commonly found in secondary rather than primary sources, such as governmental reports, press releases, etc. This is the only exception in an empirical research paper where secondary, rather than primary sources can, and usually should, be used.

When citing specific statistics, it is important to use the most recent data. For example, it makes no sense to report smoking rates from 2010 when 2016 data is readily available. Given that survey data is often not published until 18 to 24 months after it has

been collected, it is not unusual that data from the current or most recent past year cannot be reported.

**2. What is known about the association between your main topic and the second topic you have chosen? Is the evidence clear? Is it equivocal? Use specific examples and review representative major findings.**

In this paragraph, you review the literature that has addressed your question of interest and summarize the state of the field. Emphasize major findings and key conclusions rather than citing tangentially related work. **If you make a general statement regarding what the literature has shown, it is important that you follow it up with a concrete example from a specific empirical study.**

Model:

One of the most potent risk factors consistently implicated in both the etiology of smoking behavior as well as the subsequent development of nicotine dependence is major depression. Evidence for this association comes from cross-sectional and longitudinal investigations in which depression has been shown to increase risk of later smoking and nicotine dependence. For example, based on cross-sectional data from the National Comorbidity Survey, preexisting psychiatric disorders including major depression predicted an increased risk for the first onset of daily smoking and for smokers' progression to nicotine dependence (Breslau, Novak, & Kessler, 2004). Further, a longitudinal cohort study conducted in Australia showed that adolescents with high levels of depression and anxiety symptoms had an increased risk of reporting nicotine dependence in young adulthood (McKenzie, Olsson, Jorm, Romaniuk, & Patton, 2010). Notably, the vast majority of research to date has focused on the role of major depression in increasing the probability and amount of smoking (Dierker, Avenevoli, Merikangas, Flaherty, & Stolar, 2001; Dierker, Avenevoli, Stolar, & Merikangas, 2002; Rohde, Kahler, Lewinsohn, & Brown, 2004).

Never cherry pick! **Your review should objectively reflect the state of current knowledge**, rather than only the current knowledge that supports your hypothesis or only the current knowledge that you came across in a cursory or hasty review of the literature. This objectivity requires that you read widely on the topic and not just choose a small number of papers.

**3. Are there any gaps in the literature that you will be able to fill?**

The introduction builds to the justification of your own research by identifying a gap in existing scholarship. **It is important that the gap in the literature is one that you will actually be filling through your own research.** Never use the introduction to note gaps in the literature that you will be unable to address. This is misleading to the reader and greatly weakens the argument for your own work. Note that gaps in the literature that remain after you conduct your research can be described in the discussion section of your final poster, but do not belong in the introduction. In other words, it is important to

present gaps in the literature at the right time and in the right place in order to be able to tell your story clearly.

Model:

While it is true that smoking exposure is a necessary requirement for the development of nicotine dependence, frequency and quantity of smoking are markedly imperfect indices for determining an individual's probability of developing nicotine dependence (Dierker et al., 2007; Dierker & Mermelstein, 2010). For example, a substantial number of first year college students reporting daily and/or heavy smoking did not meet criteria for nicotine dependence (Dierker et al., 2007). Conversely, nicotine dependence has been seen among adolescents and young adults reporting relatively low levels of daily and non-daily smoking (Dierker, Hedeker, Rose, Selya, & Mermelstein, 2015; Selya et al., 2013). A complementary or alternate role that major depression may play is as a cause or signal of greater sensitivity to nicotine dependence, over and above an individual's level of smoking exposure. While major depression has been shown to increase an individual's probability of smoking initiation, regular use and nicotine dependence, it remains unclear whether it may signal greater sensitivity for nicotine dependence regardless of level of smoking exposure.

The gap that you fill can be quite straight forward. For example, maybe your question has been asked, but not asked in the context of a nationally representative sample or, it has not been asked within a particularly informative population subgroup (e.g. the elderly, families living in poverty, individuals with diabetes, etc.). As in my example, your contribution may be a third variables. That is, you may be interested in an association and want to compare it between two population subgroups (e.g. those with and without depression or within males vs. females).

Measurement of a particular construct can also provide ideas as to how your work may fill a gap in the literature. For example, you may be interested in the relationship between parenting and self-esteem during adolescence. There may be quite a bit of work on the association between closeness to parents and adolescents' self-esteem, but little or nothing on time spent with parents and adolescents' self-esteem.

It is not enough to just say, this is a reasonably new question though. You must also convince the reader with your writing that the gap you hope to fill is worth filling and that it will move our understanding of the topic forward.

**4. How will your analysis contribute to filling this gap? Here, you will state your research question and/or the goals of your study**

Your introduction should build to and conclude with the research questions or study objectives that you will address.

Model:

The goals of the present analysis include 1) establishing the relationship between smoking exposure and nicotine dependence; and 2) determining whether or not the relationship between smoking and nicotine dependence differs for those with and without major depression. That is, this study will investigate whether individuals with major depression are more sensitive to the development of nicotine dependence than those without major depression, and whether these differences are consistent across levels of smoking exposure.

## Method

The method section describes how the research was conducted. It comprises descriptions of your sample, procedures and measures.

### Sample:

Here, you include key features and details of your sample and how data were collected. You will identify who or what was studied (people, animals, etc.) and the level of analysis (individual, group, etc.). For survey research, it is common to include basic procedures in this section as well (i.e. what participants experienced, where the data were collected or for longitudinal studies, over what period the data were collected).

Mention observations discarded during data collection in this section (if any), but you will discuss observations discarded during data analysis (i.e. those decisions you made about the data) when you write a results section for your poster.

Model:

The sample from the first wave of the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) represents the civilian, non-institutionalized adult population of the United States and includes persons living in households, military personnel living off base, and persons residing in the following group quarters: boarding or rooming houses, non-transient hotels and motels, shelters, facilities for housing workers, college quarters and group homes. The NESARC included over sampling of Blacks, Hispanics and young adults aged 18 to 24 years. One adult was selected for interview in each household and face-to-face computer assisted interviews were conducted in respondents' homes following informed consent procedures. The sample included 43,093 adult participants age 18 and older.

It can also be useful to begin this section by stating that "Data were drawn from...." and then including the survey or study name. For surveys that are conducted with a new sample regularly (e.g. The National Household Survey of Drug Use and Health), it is also important to state in what year the data that you are using were collected.

**Note that it is critical to report the actual sample size that you are working with.** Just because you read about the study on-line and it gave you a specific sample size, does

not mean that this reflects the sample size that you are working with. **You must look at frequency tables that your statistical program is generating to determine the sample size that you are working with.**

For example, it is not uncommon for public access versions of a data set to be smaller than the total sample collected. This is due to the need to protect the anonymity of respondents. Creating a smaller, but representative sample means that even if you know someone who participated in the study, you will have no way of knowing if their responses are included.

Missing data on your variables of interest can also change your sample size. For example, if you are working with a data set of adolescent respondents age 12 to 19, it is possible that not all of the questions are asked of each participant. Maybe questions about risky sexual behavior are asked only of those age 15 and older. If you are focusing your research on risky sexual behavior, then you are not working with the whole sample. In this case, you need to report the sample size based on participants age 15 and older.

Because my sample is representative of the U.S. population (i.e. the NESARC), I do not need to describe the demographics of the participants in the sample section. If the data are based on a sample of convenience or if you are using a unique subset of a representative sample, describing the demographic makeup of the sample is very informative.

Model:

**...to be added to the sample section above**

Given that the development of chronic smoking behaviors and the risk for nicotine dependence typically develops during adolescents and young adulthood, the present analyses are based on participants age 18 to 25 who reported smoking in the past year (N=1706). Only 35.7% of this sample is female; 77.5% reported smoking daily and 16.4% (SE 1.05) reported use of any other tobacco products (i.e. cigars, snuff, pipe or chewing tobacco) during the past year.

Notice I do not report rates if they add to 100%. For example, I do not report what proportion of the sample is male, as this can be understood from the proportion of females reported. I also do not report what proportion of the sample do not smoke daily (100%-77.5%=22.5%). These are examples of how we make empirical writing as concise as possible, but without compromising important details and/or meaning.

Here is another example of a sample section based on a sample of convenience:

The sample of 1,203 pregnant women was drawn from two public prenatal clinics in Texas and Maryland. The ethnic composition was African American (n = 414, 34.4%), Hispanic, primarily Mexican American (n = 412, 34.2%), and White (n = 377, 31.3%). Most women were between the ages of 20 and 29 years; 30% were

teenagers. All were urban residents, and most (94%) had incomes below the poverty level as defined using each state's criteria for Women, Infants, and Children (WIC) eligibility.

## Measures:

In this section, you will describe the questions or measures that you will be using in your analysis. What are the variables? How were they measured?

Below are models for talking about different types of variables. **Follow these models precisely!** Be sure to use the exact language highlighted in bold below, filling in specific details based on the variables you have selected.

### Categorical variable:

**(with only two levels – i.e. measuring the presence or absence of something)**

A lifetime incidence of diabetes **was measured with the question** “Have you ever been diagnosed with Type I or Type II Diabetes?”.

### Categorical variable:

**(two levels created from many levels)**

Smoking frequency **was measured with the question** “About how many days in the past 30 days did you smoke?”. **This variable was coded dichotomously** in terms of the presence or absence of daily smoking (i.e. smoked 30 days in the past month).

### Categorical variables that are ordered:

Sadness was measured with the question “In the past week, how have you felt sad? **Possible responses ranged from 1 (never) to 5 (always).**

### Quantitative variables:

Smoking quantity **was measured with the question** “On the days that you smoked in the past year, about how many cigarettes did you usually smoke?” **Responses ranged from 1 to 72.**

### A constructed quantitative variable:

Attitude toward school **was measured with a series of nine questions.** These questions included attitudes toward academic subjects, attitudes toward teachers, counselors, and administrators; and attitudes toward the social environment in the school. **Participants were asked to rate each statement on a five-point scale from 1 (strongly disagree) to 5 (strongly agree).** **Responses were summed to create a**

**quantitative variable with higher scores reflecting** more positive attitudes toward school.

Constructed variable:

**A variable reflecting** number of years since smoking initiation **was created by** subtracting smoking onset age from current age.

An accepted or standardized measure:

Lifetime major depression was assessed using the NIAAA, Alcohol Use Disorder and Associated Disabilities Interview Schedule – DSM-IV (AUDADIS-IV).

Notes:

NEVER include the variable names that you are using in your program. (e.g. H1RE15, agegrp, ParentDEP, etc.)

If gender is a variable we will be examining, we do not describe this in our measures section. An exception to this rule would be if you had a large enough sample of participants who were not gender binary and you intended to examine gender beyond just male vs. female.

Model:

Major depression was assessed using the NIAAA, Alcohol Use Disorder and Associated Disabilities Interview Schedule – DSM-IV (AUDADIS-IV). The tobacco module of the AUDADIS-IV contains detailed questions on the frequency, quantity and patterning of tobacco use as well as symptom criteria for DSM-IV nicotine dependence. Smoking questions examined in the present analyses included age of smoking onset (“About how old were you when you smoked your first full cigarette?”), age of daily smoking onset (“About how old were you when you first started smoking every day?”), and age of onset for nicotine dependence (“About how old were you the first time some of these [nicotine dependence symptoms] began to happen to you around the same time?”). Current smoking was evaluated through frequency (“About how often did you usually smoke in the past year?”) coded dichotomously in terms of the presence or absence of daily smoking and quantity (“On the days that you smoked in the last year, about how many cigarettes did you usually smoke?”) coded quantitatively. A variable reflecting number of years since smoking initiation was created by subtracting smoking onset age from current age. Algorithms developed for the AUDADISIV variables operationalize the diagnostic criteria for DSM-IV nicotine dependence experienced in the past 12 months (current) and prior to the past 12 months (past).

## Predicted Results and Implications

What is your hypothesis regarding the association of interest? If your analyses support this hypothesis, what are the implications? Why does it matter? Will your research inform next steps in any way (e.g. policy and further research)? It is important that this section includes real implications linked to possible results. Often writers make the mistake of using this section to merely re-state their research question. This is an important section of a research plan and sometimes best written after you've had a few days to step away from your paper and allow yourself to put your question (and possible answers) into perspective.

Model:

As the major dependence producing agent in cigarettes, nicotine is believed to play a pivotal role in keeping smoking rates stable. While chronic use is a key feature in the development of dependence, the hypothesis being evaluated in the present study is that depression is a marker of sensitivity to nicotine dependence over and above smoking exposure. If individuals with major depression are more sensitive to the development of nicotine dependence regardless of how much they smoke, they would represent an important population subgroup for targeted smoking intervention programs. It would also be important for future research to consider co-occurring psychiatric disorders and whether or not they further increase sensitivity to nicotine dependence over and above level of smoking.

## References

The reference section fully documents the citations listed in the paper. All in-text citations in the research plan should appear in the references section and all references should be cited in the text. Begin your references section on a new page.

**You must use Endnote or another bibliographic software package** to cite references within your text and to create a reference section at the end of your paper.

References should be formatted in APA or numbered format.

APA Model:

### References

Breslau, N., Novak, S. P., & Kessler, R. C. (2004). Psychiatric disorders and stages of smoking. *Biol Psychiatry*, 55(1), 69-76.

CDC (2018). Smoking is down, but almost 38 million American adults still smoke [Press release]. Retrieved from <https://www.cdc.gov/media/releases/2018/p0118-smoking-rates-declining.html>

- Dierker, L., Avenevoli, S., Merikangas, K. R., Flaherty, B. P., & Stolar, M. (2001). Association between psychiatric disorders and the progression of tobacco use behaviors. *Journal of the American Academy of Child & Adolescent Psychiatry, 40*(10), 1159-1167.
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- Dierker, L., Donny, E., Tiffany, S., Colby, S. M., Perrine, N., Clayton, R. R., & Network, T. (2007). The association between cigarette smoking and DSM-IV nicotine dependence among first year college students. *Drug and Alcohol Dependence, 86*(2-3), 106-114. doi:10.1016/j.drugalcdep.2006.05.025
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- Rohde, P., Kahler, C. W., Lewinsohn, P. M., & Brown, R. A. (2004). Psychiatric disorders, familial factors, and cigarette smoking: II. Associations with progression to daily smoking. *Nicotine & Tobacco Research, 6*(1), 119-132.
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Numbered Model:

References

1. CDC, *Smoking is down, but almost 38 million American adults still smoke*. 2018.
2. U.S. Department of Health and Human Services, *The health consequences of smoking—50 years of progress: a report of the Surgeon General*. Atlanta: U.S. , C.f.D.C.a.P. Department of Health and Human Services, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, Editor. 2014.
3. O’Loughlin, J., et al., *Nicotine-dependence symptoms are associated with smoking frequency in adolescents*. American Journal of Preventive Medicine 2003. **25**(3): p. 219-225.
4. Shiffman, S. and M.A. Sayette, *Validation of the Nicotine Dependence Syndrome Scale (NDSS): A criterion-group design contrasting chippers and regular smokers*. Drug and Alcohol Dependence, 2005. **79**: p. 45-52.
5. DiFranza, J.R., et al., *Symptoms of tobacco dependence after brief inntermittent use: The Development and Assessment of Nicotine Dependence in Youth-2 Study*. Archives of Pediatric & Adolescent Medicine, 2007. **161**: p. 704-710.
6. Prokhorov, A.V., et al., *Validation of the modified Fagerstrom tolerance questionnaire with salivary cotinine among adolescents*. Addictive Behaviors, 2000. **25**: p. 429–433.
7. Breslau, N., S.P. Novak, and R.C. Kessler, *Psychiatric disorders and stages of smoking*. Biol Psychiatry, 2004. **55**(1): p. 69-76.
8. McKenzie, M., et al., *Association of adolescent symptoms of depression and anxiety with daily smoking and nicotine dependence in young adulthood: Findings from a 10-year longitudinal study*. Addiction, 2010. **105**(9): p. 1652-1659.
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10. Dierker, L., et al., *Smoking and depression: An examination of mechanisms of comorbidity*. The American Journal of Psychiatry, 2002. **159**(6): p. 947-953.
11. Rohde, P., et al., *Psychiatric disorders, familial factors, and cigarette smoking: II. Associations with progression to daily smoking*. Nicotine & Tobacco Research, 2004. **6**(1): p. 119-132.
12. Dierker, L. and R. Mermelstein, *Early emerging nicotine-dependence symptoms: a signal of propensity for chronic smoking behavior in adolescents*. Journal of Pediatrics, 2010. **156**(5): p. 818-822.
13. Dierker, L., et al., *The association between cigarette smoking and DSM-IV nicotine dependence among first year college students*. Drug and Alcohol Dependence, 2007. **86**(2-3): p. 106-114.
14. Dierker, L., et al., *Early emerging nicotine dependence symptoms in adolescence predict daily smoking in young adulthood*. Drug and Alcohol Dependence, 2015. **151**: p. 267-271.
15. Selya, A.S., et al., *Time-varying effects of smoking quantity and nicotine dependence on adolescent smoking regularity*. Drug and Alcohol Dependence, 2013. **128**(3): p. 230-237.

## **ADDITIONAL GUIDELINES**

NEVER use the word “prove” or “proven” when writing about research (or when writing about anything else for that matter).

NEVER use first person language when writing about research (e.g. I, me, my).

*Be succinct.* Excise unnecessary words and sentences. Revise, revise and revise again.

Avoid any cause and effect language unless your data is based on an experiment.

Define topics that are not commonly understood. While you would not need to define a topic such as depression, if you were investigating border-line personality disorder, it would be important to describe the common features of the disorder to your audience.

Note that every primary source article that you read is a model of the kind of writing you are trying to accomplish.

The paper should be single-spaced and will be only 7 to 8 paragraphs long (excluding the title, affiliation and reference sections). SEE FORMATTING in “RESEARCH PLAN MODEL PAPER” document.

**SUMIT YOUR PAPER AS A WORD FILE WITH YOUR FIRST AND LAST NAME AS THE TITLE OF THE DOCUMENT**

A Google doc is also acceptable since it can be opened in Word. **DO NOT submit the paper as a pdf or any other format.**

**Model:**

Clare Smith.docx
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