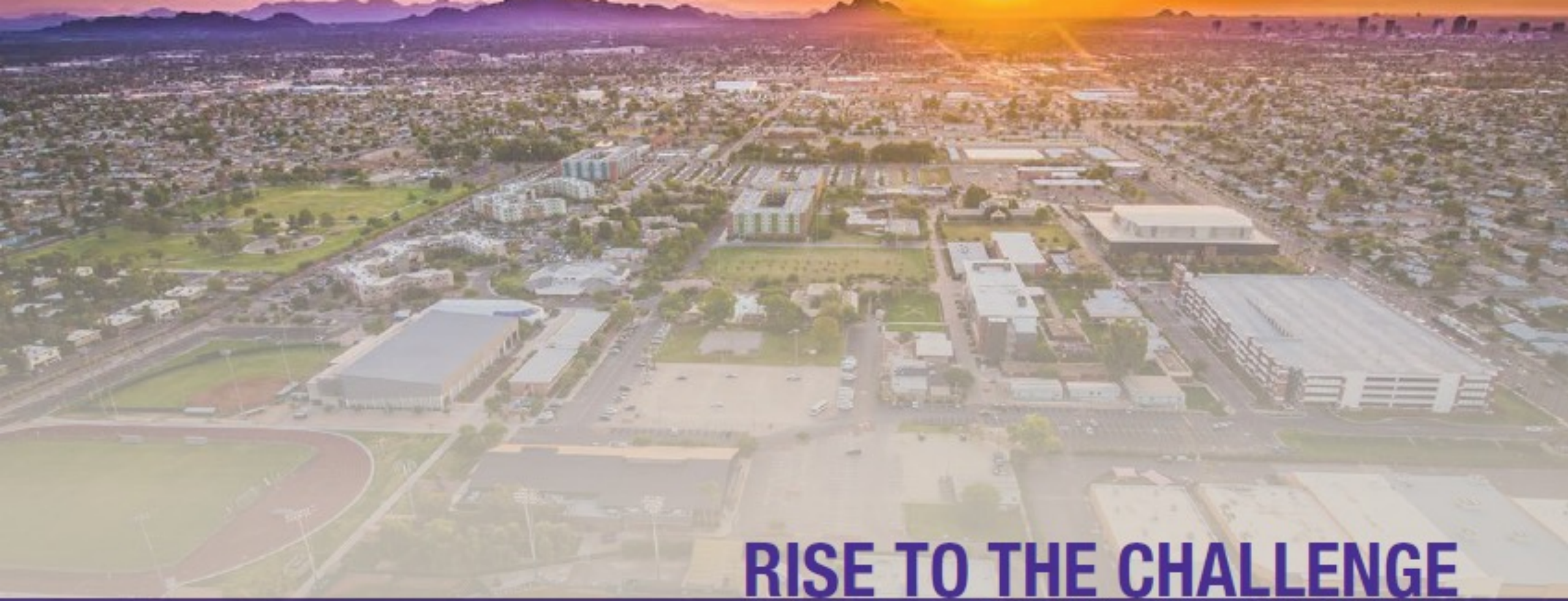

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College of Doctoral Studies

The Relationship Between Birth Order, Resilience, and Self-Esteem in Masters Level Counseling Students in the United States

Tara Chase

Residency Instructors: Dr. Adkins
Dr. Quade

Core Elements Table

Element	Description
Problem Statement	It is not known if and to what extent birth order explains the variance in resilience (CD-RISC) and self-esteem (RSES) among master's level counseling students.
Purpose Statement	The purpose of this quantitative non-experimental study is to assess if and to what extent birth order explains the variance in resilience (CD-RISC) and self-esteem (RSES) among master's level counseling students in the United States.
Research Question(s)	**RQ:** To what extent does birth order explain the variance in resilience (CD-RISC) and self-esteem (RSES) among master's level counseling students?
Phenomenon	n/a
Data Sources	**Connor Davidson Resilience Scale** (CD-RISC) - Measures resilience through 25 items, assessed on a 5-point Likert scale. **Rosenberg Self-Esteem Scale (RSES)** – Measures self-esteem through 10 items, assessed on a 4-point Likert scale.
Analytical Approach	Two simple linear regressions will be conducted to determine whether birth order significantly predicts levels of self-esteem or levels of resilience among master's level graduate students.

Background to the Problem

The topic of birth order as a factor in personality development emerged in early psychological literature through Adler's foundational work, which theorized that birth order impacts self-perception, confidence, and behavior within family systems (Adler, 1928). This laid the groundwork for future empirical exploration of psychological traits like self-esteem and adaptability.

- **Ernst and Angst (1983)** conducted a large-scale empirical review of birth order literature and found limited, inconsistent evidence linking birth order to personality traits. Their review emphasized methodological challenges and called for more rigorous, statistically sound studies.
- **Sulloway (1996)** conducted a historical-psychological analysis of over 1,000 historical figures and found that firstborns were more conscientious and later-borns more open to experience. His work reinvigorated interest in the topic and linked it to traits such as independence, adaptability, and social openness.
- **Jefferson, Herbst, & McCrae (1998)** conducted a correlational study using both self-report and observer ratings to examine birth order and the Big Five personality traits among 5,000 adults. They found only modest effects, with firstborns scoring slightly higher in conscientiousness and self-discipline, traits associated with academic success and confidence.

Background to the Problem

Trends over the past two decades have moved toward using standardized personality measures (e.g., the Big Five) and large data sets to assess the statistical significance of birth order effects. Studies have typically found **small but consistent links** between birth order and traits like self-confidence, adaptability, and leadership (Paulhus et al., 1999; Rohrer et al., 2015).

- **In the past five years**, researchers have shifted toward examining **context-specific outcomes** (e.g., academic performance, resilience, psychological well-being, self-esteem) rather than broad personality traits. For example, **Atta et al. (2023)** conducted a quantitative survey study with 300 university students and found that firstborns exhibited higher academic self-esteem, while later-borns were more socially adaptable. **They recommended further study on internal psychological constructs like self-esteem and resilience in relation to birth order.**

- **Ashton & Lee (2025)** used a large-scale personality dataset to explore birth order effects and found that birth order was linked to measurable differences in conscientiousness and emotional stability, factors associated with resilience and self esteem.

- **Dalmış et al. (2025)** conducted a structural equation modeling study with 478 university students and found that resilience was significantly influenced by subjective well-being and social supports. Though not focused on birth order, their findings highlighted the importance of individual and environmental factors in shaping resilience.

Problem Space:

- Atta et al. (2023) conducted a quantitative study to investigate the relationship between birth order and academic performance, confidence, and self-perception among students. Findings indicated that firstborns reported higher self-confidence and academic self-efficacy compared to later-born students. **The study recommended further research into the psychological mechanisms, such as self-esteem and resilience, that might underlie these birth order-related differences.**

- Ashton & Lee (2025) explored personality differences based on birth order using a large cross-cultural dataset. The study found small but significant differences in traits related to self-confidence and social adaptability. Firstborns demonstrated higher conscientiousness and self-regulation, traits closely linked to self-esteem. **The authors suggested additional work be done to examine how these personality differences influence psychological resilience in academic settings.**

Problem Space:

- Dalmış et al. (2025) examined the connection between resilience, subjective well-being, and anxiety among **478 university students**. While the study did not directly investigate birth order, the findings emphasized the role of internal psychological resources, such as resilience and self-esteem, in managing academic stress. **The authors called for further exploration into familial and developmental factors, including sibling dynamics, that may influence resilience.**

- Deo et al. (2024) conducted a mixed-methods study comparing resilience and adjustment between firstborn and second-born **200 university students**. Results revealed that firstborns exhibited higher levels of self-confidence and emotional stability, while second-borns demonstrated greater flexibility. **The study highlighted the importance of considering birth order in resilience-related research and recommended extending the analysis to diverse educational settings.**

Problem Space:

- Furu et al. (2023) analyzed resilience-related frameworks in early education policies across several countries. Although the study did not address birth order directly, it emphasized resilience as a foundational capacity formed through early relational experiences. **The study supports a broader conceptual linkage between early family dynamics and long-term psychological adaptability, laying a basis for examining how birth order contributes to resilience in later academic environments.**

Problem Statement

It is not known if and to what extent birth order explains the variance in resilience (CD-RISC) and self-esteem (RSES) among master's level counseling students.

Purpose Statement

The purpose of this quantitative non-experimental study is to assess if and to what extent birth order explains the variance in resilience (CD-RISC) and self-esteem (RSES) among master's level counseling students in the United States.

Research Questions & Hypotheses

- RQ: To what extent does birth order explain the variance in resilience (CD-RISC) and self-esteem (RSES) among master's level counseling students?
  - $H1_{0.}$ Birth order does not significantly explain the variance in resilience (CD-RISC) among master's level counseling students.
  - $H1_{A.}$ Birth order does significantly explain the variance in resilience (CD-RISC) among master's level counseling students.
  - $H1_{o}$ Birth order does not significantly explain the variance in self-esteem (RSES) among master's level counseling students.
  - $H1_{A.}$ Birth order does significantly explain the variance in self-esteem (RSES) among master's level counseling students.

DOCTORATES WITH PURPOSE

Literature Review:

Major Topic/Theme	Topic/Theme Description
Master Level Counseling Students	**Master's-Level Counseling Students in Relation to Birth Order, Resilience, and Self-Esteem** Research suggests that birth order influences personality development, which may impact traits like self-esteem and resilience. **Resilience in Counseling Students**: Resilience, the ability to bounce back from adversity, is crucial for counseling professionals who often encounter high-stress situations. Studies indicate that higher resilience levels correlate with better coping strategies and overall well-being among counseling students. **Self-Esteem and Academic Performance**: Self-esteem, defined as an individual's overall subjective evaluation of their worth, has been linked to academic success. Counseling students with higher self-esteem are more likely to engage confidently in their studies and clinical practice (Acosta-Gonzaga, 2023). Counseling **Students' Unique Stressors**: Counseling students face unique stressors related to their training, including exposure to clients' traumatic experiences. Developing resilience and maintaining healthy self-esteem are essential for their professional development and effectiveness.
Birth Order	**Birth Order and Trait Development** Birth order has long been theorized to influence personality traits such as, confidence, and resilience. Firstborns often report higher conscientiousness and self-confidence, while later-borns tend to display more flexibility and social adaptability. These traits may influence educational performance and professional readiness in counseling students. **Ashton & Lee (2025)** found that birth order predicted differences in resilience in over 1,000 participants using a cross-cultural personality dataset. According to Ashton & Lee (2025), firstborns were more achievement-driven, which may correlate with traits such as academic self-worth in counseling students. **Atta et al. (2023)** showed that firstborn students exhibited higher self-confidence and academic performance compared to later-borns in a study of 300 university students. **Deo, Rana, & Dhillon (2024)** conducted a mixed-methods study comparing resilience and adjustment between firstborns and second-borns and found consistent personality differences in Indian university students.

Literature Review:

Major Topic/Theme	Topic/Theme Description
Resilience	**Resilience in Graduate Student Populations** Resilience refers to an individual's ability to adapt to stress or adversity and is considered essential for academic persistence and mental wellness in graduate-level education. Among counseling students, resilience is critical for managing both academic and emotional demands. **Dalmış et al. (2025)** used structural equation modeling with 478 students and found that resilience was positively related to subjective well-being and lower anxiety. **Furu et al. (2023)** analyzed early childhood education policies and highlighted the foundational importance of resilience across the lifespan. **Connor & Davidson (2003)** developed the CD-RISC, a widely used and validated instrument for measuring resilience in student populations. According to Dalmış et al. (2025), building resilience in university students may help buffer stress and promote well-being in rigorous academic settings.
Self-Esteem	**Self-Esteem and Academic Success** Self-esteem, the perception of one's self-worth, is a well-established predictor of academic engagement, mental health, and performance. In counseling education, where interpersonal confidence and self-awareness are critical, self-esteem is especially relevant. **Rosenberg (1965)** developed the seminal Self-Esteem Scale, frequently used to assess academic and personal self-worth in student research. **Bandura (1997)** described self-efficacy, closely related to self-esteem, as a determinant of motivation and goal-setting in academic contexts. **Jefferson, Herbst, & McCrae (1998)** found that firstborns scored higher in self-discipline and confidence, suggesting a link between birth order and self-esteem. According to Jefferson et al. (1998), early family dynamics may have long-term implications for confidence and self-esteem in educational environments like graduate counseling programs.

Theoretical Framework

Kumar's Resiliency Scale, CR8 Model

Developer: Mohan Kumar
Year of Development: Introduced in 2014

History: Resilience Model, also known as the CR8 Model, was developed to explain how individuals adapt and recover from adversity using a combination of personal strengths and environmental supports. The model identifies eight core strategies—including cognitive flexibility, reflection, optimism, and emotional regulation—that contribute to the development of resilience in both personal and professional contexts (Kumar, 2018). It emerged in response to the need for a more dynamic, strengths-based understanding of resilience beyond static personality traits.

Relevance: This model, influenced by internal beliefs (like self-esteem) and external factors (such as family and academic environments). It reframes resilience not as a fixed trait but as a multidimensional process that can be developed over time through education and life experiences.

Application: This framework supports your study by providing a foundation for understanding resilience (dependent variable) in master's graduate students. It aligns with your goal of examining how individual differences shaped by birth order may influence students' ability to adapt, maintain confidence, and thrive in challenging academic settings.

Theoretical Framework

Birth Order Theory

Developer: Alfred Adler

Year of Development: First introduced around 1928

History: One of the earliest psychological frameworks to link family dynamics to personality, Adler's Birth Order Theory suggests that a child's position within the family (e.g., firstborn, middle, youngest, or only child) significantly shapes their behavioral traits and psychological development (Adler, 1928).

Relevance: This theory proposes that a person's position in the family hierarchy (e.g., firstborn, middle, youngest, only child) influences personality traits, including self-esteem, leadership, adaptability, and social behavior.

Application: This framework supports your investigation into how birth order (independent variable) may shape internal traits like resilience and self-esteem in academic contexts.

POSITION	FAMILY SITUATION	CHILD'S CHARACTERISTICS
ONLY	Birth is a miracle. Parents have no previous experience. Retains 200% attention from both parents. May become rival of one parent. Can be over-protected and spoiled.	Likes being the center of adult attention. Often has difficulty sharing with peers. Prefers adult company and uses adult language.
OLDEST	Dethroned by next child. Has to learn to share. Parent expectations are usually very high. Often given responsibility and expected to set an example.	May become authoritarian or strict. Feels power is his right. Can become helpful if encouraged. May turn to the father after birth of the next child.
SECOND	He has a pacemaker. There is always someone ahead.	Is more competitive, wants to overtake older child. May become a rebel or try to outdo everyone. Competition can deteriorate into rivalry.
MIDDLE	Is "sandwiched" in. May feel squeezed out of a position of privilege and significance.	May be even-tempered, "take it or leave it" attitude. May have trouble finding a place or become a fighter of injustice.
YOUNGEST	Has many mothers and fathers. Older children try to educate him. Never dethroned.	Wants to be bigger than the others. May have huge plans that never work out. Can stay the "baby." Frequently spoiled.

Study Variables

Variable Name	Conceptual Definition	Operational Definition	Measurement Level	Instrument/Data Source
Predictor Variable: [Birth Order]	Birth order refers to the chronological position of a child within a sibling group (e.g., firstborn, middle child, youngest, or only child). (Sulloway, 1996).	Birth order will be measured through a demographic questionnaire item: *"What is your birth order in your family?"* Options include: Firstborn, Middle-born, Youngest, Only child, Other	Ordinal	**Demographic Questionnaire** Sulloway, F. J. (1996). *Born to rebel: Birth order, family dynamics, and creative lives.* New York: Pantheon Books
Criterion Variable: [Resilience]	Resilience is the psychological capacity to adapt to, withstand, or recover from significant stressors, adversity, or trauma while maintaining or regaining mental health (Connor & Davidson, 2003).	Measured using the **Connor-Davidson Resilience Scale (CD-RISC-10).** Participants rate 10 statements such as "I am able to adapt when changes occur" on a 5-point Likert scale ranging from 0 = Not true at all to 4 = True nearly all of the time.	Interval	***Connor-Davidson Resilience Scale (CD-RISC-10)*** *(Connor, K. M., & Davidson, J. R. (2003). Development of a new resilience scale: The Connor-Davidson Resilience Scale (CD-RISC). Depression and Anxiety, 18(2), 76–82. https://doi.org/10.1002/da.10113)*
Criterion Variable [Self Esteem]	Self-esteem is defined as the overall value a person places on themselves as a person, encompassing feelings of self-worth, self-respect, and self-acceptance (Rosenberg, 1965).	Measured using the **Rosenberg Self-Esteem Scale (RSES)**, a 10-item scale with statements such as *"On the whole, I am satisfied with myself,"* rated on a 4-point Likert scale from 1 = Strongly Disagree to 4 = Strongly Agree.	Interval	***Rosenberg Self-Esteem Scale (RSES)*** *(Rosenberg, M. (1965). Society and the adolescent self-image. Princeton, NJ: Princeton University Press.)*

Methodology Justification

Quantitative Attributes	Quantitative Justification
Quantitative research is defined as an objective, deductive approach that seeks to measure variables numerically, test hypotheses, and generalize findings across populations (Watson, 2015). It relies on standardized instruments and statistical analysis to uncover relationships, patterns, or trends between variables. According to Yilmaz (2013), quantitative methodology is rooted in a **positivist epistemology**, assuming that reality is measurable, observable, and independent of the researcher. It focuses on testing theory, maintaining objectivity, and employing structured instruments to gather quantifiable data.	This **quantitative method** is appropriate because the focus of the study is to examine measurable relationships between variables using standardized instruments and statistical analysis.

Design

Selected Design	Definition/Characteristics (Use literature support)	Justification (use /not use)
Experimental	Muijs (2010) defines experimental design as a method where researchers manipulate one or more independent variables and randomly assign participants to groups to observe causal effects. Similarly, Cook and Campbell (1979) describe true experiments as designs that use random assignment and controlled conditions to establish internal validity and eliminate alternative explanations.	**Lack of Variable Manipulation:** Experimental designs require manipulation of the independent variable. In your study, **birth order** is a naturally occurring characteristic that **cannot be manipulated or randomly assigned**, making experimental design inappropriate.
Non-Experimental	A correlational design is a **non-experimental quantitative method** used to determine the **strength and direction of relationships between two or more variables** without manipulating them (Wang & Zhang, 2021). It allows researchers to examine patterns of association across naturally occurring variables in a specific population. According to Yilmaz (2013), correlational research is advantageous when the goal is to **identify relationships between constructs** for prediction or theoretical modeling. However, it does not establish causation and is sensitive to confounding variables.	As a **correlational design, non-experimental** is appropriate because the focus of the study is to examine the extent to which a relationship exists between birth order and psychological traits such as confidence, resilience, and adaptability without manipulating any variables.

Feasibility Slide 1

Resources for Study

- **Feasibility**: High
- **Justification**: This study requires common resources such as access to online survey tools (e.g., Qualtrics, Google Forms), statistical software (e.g., SPSS, JASP), and access to graduate student populations via university networks, professional organizations, or academic forums. No lab-based equipment or in-person testing is required, making this study logistically manageable and cost-effective.
- Known Costs:
  $10 to buy **Connor Davidson Resilience Scale**

  Unknown Costs:
  Statistical Software

Ethical Concerns

- **Feasibility**: High
- **Justification**: The study poses minimal risk to participants. It involves standard psychological self-report questionnaires measuring birth order, and validated scales for self-esteem, and resilience.
- All instruments are non-invasive, and participation is voluntary, anonymous, and protected under informed consent and data confidentiality protocols.
- IRB approval is likely to be straightforward with appropriate safeguards in place.
- **Limitations:** population accuracy (verification of master's level counseling students).

Feasibility Slide 2

Study Alignment with Program

- **Feasibility**: Strong Alignment
- **Program of Study**: *Doctor of Philosophy in Counselor Education and Supervision*
- **Justification**: Topic aligns well with the program's emphasis on human development, personality, adaptive functioning, and counselor education. Understanding how family dynamics (e.g., birth order) affect psychological resilience and self-esteem contributes to the counselor's role in assessing clients holistically and developing effective interventions. The study also supports leadership in counselor education by contributing to knowledge relevant for curriculum development and student support.

Feasibility Concerns

- **Possible Concern:**
  Access to master's level participants
  - **Mitigation**: Can be addressed by partnering with graduate programs, alumni offices, and professional organizations (e.g., ACA, Chi Sigma Iota) for recruitment.
- **Possible Concern: Self-report bias**
  - **Mitigation**: Uses validated and reliable instruments (e.g., CD-RISC, RSES) and include anonymous participation to reduce social desirability bias.

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Thank you

Questions and Discussion

DOCTORATES
WITH PURPOSE

RSD-884
Residency 2

The Relationship Between Birth Order, Resilience, and Self-Esteem in Masters Level Counseling Students in the United States

By: Tara Chase

Population

- **Population of Interest:** Graduate counseling students in the United States.
- **Target Population:** Master's level counseling students currently enrolled in accredited programs in the Southeastern United States.
- **Sample Size and Sampling Approach:** Expected sample size: **102** students, based on GPower analysis for multiple regression with 3 predictors, power = 0.80, $\alpha = 0.05$, medium effect size ($f^2 = 0.15$). Sampling approach: **Convenience sampling** through university mailing lists and social media groups.

Population, Target Population, & Sample

General Population	Target Population	Sample
The entire group of individuals relevant to a research question (Creswell & Creswell, 2018).	A subset of the population with specific inclusion criteria relevant to the study (Fink, 2017).	The actual participants from the target population who contribute data (Flick, 2018).
General Population: Graduate-level counseling students in the U.S.	Master's counseling students from CACREP-accredited universities based in all 50 states.	Approximately 102 students who voluntarily agree to participate via online survey. (based on G*Power analysis) G*Power for a linear multiple regression (fixed model, R^2 increase), Minimum Required Sample Size ≈ 77–92 Adding 10–15% extra to account for: • Dropouts • Incomplete surveys • Assumption violations

Instrumentation/Data Sources

Instrument #1: Connor-Davidson Resilience Scale (CD-RISC)	Instrument #2: Rosenberg Self-Esteem Scale (RSES)	Instrument #3: Demographic Questionnaire
Measures resilience using 25 items on a 5-point Likert scale. Provides data for RQ1 and associated hypotheses. Data Type: Continuous (interval) Reliability: Cronbach's alpha > .80 in multiple studies	Measures self-esteem using 10 items on a 4-point Likert scale. Provides data for RQ2 and associated hypotheses. Data Type: Continuous (interval) Reliability: Cronbach's alpha ranges from .77 to .88 in past validations	Measures self-esteem using 10 items on a 4-point Likert scale. Provides data for RQ2 and associated hypotheses. Data Type: Continuous (interval) Reliability: Cronbach's alpha ranges from .77 to .88 in past validations

Data Collection Steps: Slide 1
Required Permissions

Required permissions/approvals (prior to data collection)

- Site approval (if applicable)
- Permission to use CD-RISC and RSES instruments
- Documentation from instrument developers or prior studies
- GCU Chair and Committee Approval
- AQR Approval
- IRB Approval
- Signed Informed Consent from participants

Data Collection Steps: Slide 2

Sampling Strategy and Sample Selection

	Primary Sampling (Plan A)	Backup Sampling (Plan B)
Steps to Access/Identify Participants for Each Data Source	Source 1: Email IRB-approved invitation and study link to program coordinators at CACREP-accredited counseling programs nationwide.	Source 1: Request that initial respondents forward the survey link to classmates and peers.
	Source 2: Post recruitment flyer and survey link in national academic communities such as: • American Counseling Association (ACA) student forums • LinkedIn graduate counseling groups • University-affiliated Facebook groups	Source 2: Ask faculty contacts to redistribute the flyer through academic listservs or class announcements.
	Source 3: Distribute link through counseling student email lists (via partnerships with faculty contacts).Utilize university learning management systems (e.g., Canvas, Blackboard) to post study notices.	Source 3: Embed social share buttons in the Qualtrics survey to facilitate peer distribution.
Participation Criteria for Each Data Source	• Must be 18 years or older • Currently enrolled in a U.S.-based CACREP-accredited master's counseling program • Willing to voluntarily participate in a 10–15 minute online survey	Same as Plan A
Sampling Strategy & Description for Each Data Source	**Convenience Sampling** This involves selecting participants who are easily accessible to the researcher. It is efficient and commonly used in educational research when targeting known groups (Etikan, Musa, & Alkassim, 2016).	**Snowball Sampling** A non-probability method where existing participants refer others to the study. Useful for reaching a broader participant base and enhancing recruitment when access is limited (Naderifar et al., 2017).

Data Collection Steps: Slide 3
Collecting the Data

Source 1: Master's-Level Counseling Students (Primary Sample)

Step-by-Step Process on Data Collection Day:

1. Verify IRB Approval and confirm all documentation and permissions are in place (e.g., site approval, instrument licenses).
2. Send Recruitment Email to faculty/program directors with IRB-approved flyer and unique Qualtrics survey link.
3. Participants Click Link and are taken to a welcome page with purpose, estimated time, and confidentiality statement.
4. Informed Consent Page appears. Participants must click “I Agree” to proceed.
5. Survey Begins:
    1. Section 1: Demographics (age, gender, program status, etc.)
    2. Section 2: CD-RISC (resilience measure)
    3. Section 3: RSES (self-esteem measure)
6. Automatic Submission: Survey responses are securely submitted to encrypted cloud storage once completed.
7. Monitor Dashboard: Researcher checks Qualtrics dashboard daily for:
    1. Completion rate
    2. Missing data
    3. Any technical issues
8. Reminder Emails: Sent one week later to increase participation, if needed.

Data Collection Steps: Slide 3
Data Management and Storage

- All data will be stored in a password-protected, encrypted OneDrive account approved by Grand Canyon University. The Qualtrics survey platform will temporarily house the data until it is downloaded for analysis.
- The data will be stored securely for a minimum of three years after the completion of the study, in accordance with IRB and federal research guidelines.
- Access will be restricted to the principal investigator and dissertation chair only. Files will be encrypted both in transit and at rest. All data will be anonymized by removing IP addresses and participant identifiers.
- At the end of the three-year retention period: Electronic files will be permanently deleted using a secure erase utility. Any printed materials (if applicable) will be shredded using a cross-cut shredder.

Data Analysis: Slide 2 - Quantitative Hypothesis #1 – Analysis Strategy

1. Cleaning & Preparation:
    - Download Qualtrics data into SPSS.
    - Remove incomplete responses.
    - Handle missing data (listwise deletion if <5% missing).
    - Check for outliers using standardized z-scores.

2. Descriptive Statistics:
    - Mean, median, SD for demographics
    - Descriptives for RSES and CD-RISC scores

3. Inferential Analysis:
    - Test: Multiple regression analysis
    - Justification: Appropriate for assessing how well birth order predicts continuous variables (resilience & self-esteem).
    - Parametric assumptions expected to be met due to scale types and central limit theorem.

Data Analysis: Slide 3 - Quantitative Hypothesis #1 – Analysis Strategy

4. Assumption Testing for Multiple Regression:
    - Linearity: Scatterplots of predicted vs. observed
    - Normality: Histogram & Shapiro-Wilk tests of residuals
    - Homoscedasticity: Plot of residuals
    - Multicollinearity: VIF < 5 expected
5. Significance Testing:
    - $\alpha = 0.05$ (Type I error rate)
    - Bonferroni correction applied for two dependent variables ($\alpha\_adjusted = 0.025$)

6. Post Hoc Tests:
    - None required unless subgroup analysis becomes necessary.

7. Decision Rules:
    - Reject H_0 if $p < \alpha\_adjusted$.
    - Effect sizes (R^2) will also be interpreted.

Data Analysis Steps: Slide 2
Hypothesis #2 – Analysis Strategy

- Step 1: Run second regression model using birth order as predictor for RSES scores.
- Step 2: Confirm assumptions as above.
- Step 3: Evaluate R^2 and standardized beta coefficients.
- Step 4: Compare significance levels using p-values (adjusted $\alpha = 0.025$).
- Step 5: Report findings in APA style with confidence intervals.

Key References

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Thank you

Questions and Discussion

DOCTORATES
WITH PURPOSE

Backup Slides

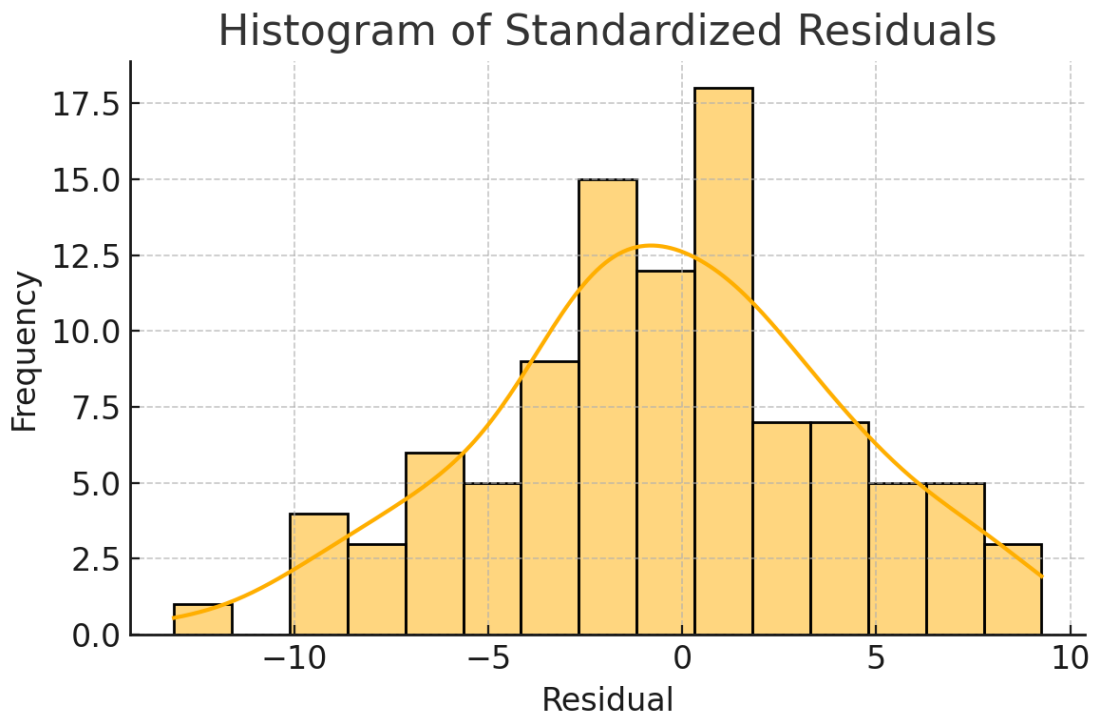
See Mock Tables and Assumptions below:

Assumptions Testing for Multiple Regression

Assumption	Test/Diagnostic	Criterion	Result
Linearity	Scatterplot of residuals vs. predicted	Random, no curve pattern	Met
Normality	Shapiro-Wilk test / Histogram / Q-Q Plot	$p > .05$ or approx. normal distribution	Met
Homoscedasticity	Residuals plot	Equal spread around horizontal line	Met
Multicollinearity	Variance Inflation Factor (VIF)	$VIF < 5$	Met
Independence	Durbin-Watson statistic	Between 1.5 and 2.5	Met

Figure 1 - Appendix A: Assumption Testing Figures
Histogram of Standardized Residuals

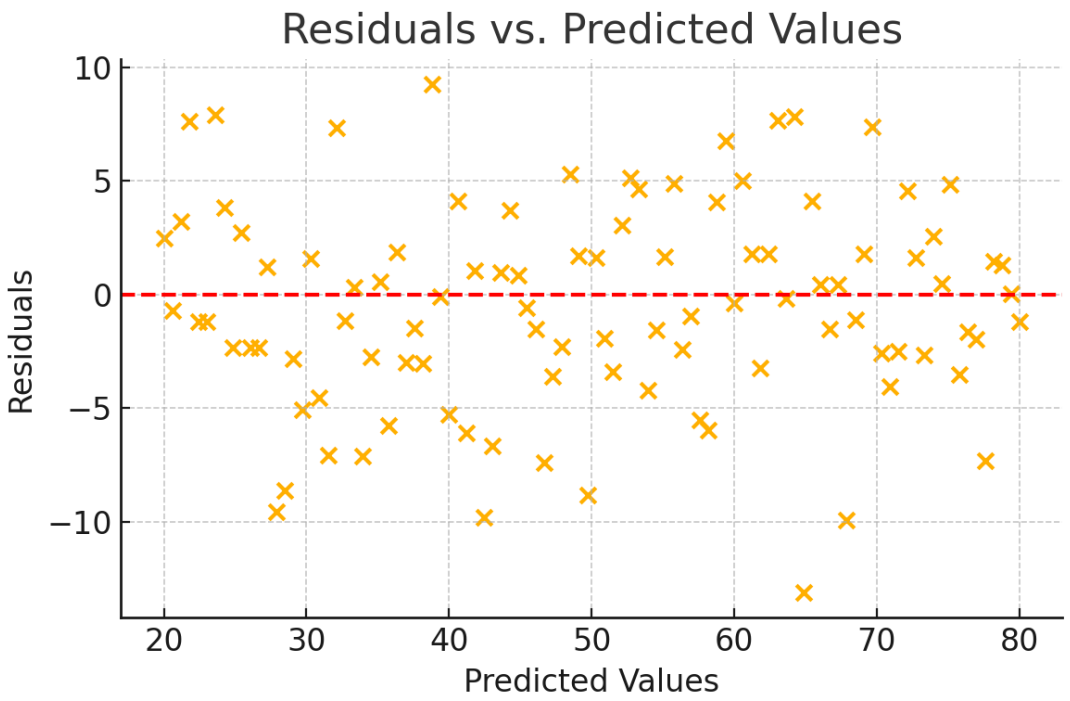
This figure displays the distribution of standardized residuals. The approximately normal shape supports the assumption of normality.



Regression Model Summary for Predicting Resilience and Self-Esteem

Dependent Variable	Predictor	B	SE B	β	t	p	R^2
Resilience (CD-RISC)	Birth Order	2.10	0.68	.32	3.09	.003 **	0.102
Self-Esteem (RSES)	Birth Order	1.75	0.72	.27	2.43	.017 *	0.073

Figure 2
Residuals vs. Predicted Values



Results

- This scatterplot shows a random spread of residuals around the horizontal axis, supporting the assumptions of linearity and homoscedasticity.