



THE
STUDENT SPHERE

JOURNAL

The Student Sphere

Volume 1, Issue 1
Summer 2026

Published By: The Student Sphere

www.thestudentsphere.org

editors@thestudentsphere.org

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Editor's Letter

Young minds shape the future of scientific research. Yet their work seldom receives a legitimate basis in academic literature. This is the gap that *The Student Sphere* aims to bridge.

Our mission centers around making scientific knowledge more accessible while providing student researchers with the professional platform to share their work. We believe that talent, inquiry, and science is not limited by age or academic title. True scholarship can come from anyone willing to ask the right questions, and dedicate themselves to the answers.

The articles featured in this inaugural issue cover a range of topics, from neuroscience to public policy. In each respective discipline, every author has demonstrated the commitment and creativity that defines the next generation of scientists. These authors also come from around the globe, representing the diverse backgrounds of student research. Every manuscript has undergone thorough editorial and peer review to ensure that the presented work reflects the high academic standards our journal aims to uphold.

This publication would not be possible without the diligent efforts of our editorial board, mentors, outreach team, and peer-reviewers. Their many hours of review, edits, and collaboration are what make this organization possible. We would like to thank each of these contributors for their outstanding dedication.

As you turn these pages, we encourage you to think not only about the contents of the manuscripts, but also about the questions that inspired them. Research is an evolving field, and can only grow through curiosity, thoughtful discussion, and a relentless pursuit for answers. Student researchers hold more potential than we are often given credit for, and this publication is a testament to the incredible strength of our scientific community.

Thank you for reading and supporting student scholarship. We are honored to present this inaugural issue of *The Student Sphere*, and we look forward to what lies ahead.

Sincerely,

Hyuna Kang
Founding Editor-in-Chief



Afreen Akhtar
Founding Editor-in-Chief



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A Comparative Analysis and Pilot Study of Parental Autonomy Support as a Predictor of Adolescent Self-Esteem in Twin and Non-Twin Populations

Nevin Thomas

Abstract: Adolescent self-esteem develops through the interaction of genetic and environmental factors, yet existing research fails to examine how these processes operate within twin families - where identity formation is uniquely shaped by comparison and expectations of similarity. This study investigates whether parental autonomy support predicts adolescent self-esteem differently for twins and non-twins. A quantitative cross-sectional design was used to assess self-esteem (Rosenberg Self-Esteem Scale), perceived parental autonomy support (Perceived Parental Autonomy Support Scale), and parent-child relational climate (Parent-Child Relationship subscale of the Parental Environment Questionnaire). Participants included monozygotic twins, dizygotic twins, non-twin adolescents, and their parents. Descriptive statistics, scatterplot trendline analyses, and Pearson correlation coefficients were used to evaluate associations among the three constructs across sibling groups. Results showed a positive correlation between autonomy support and self-esteem for both twins and non-twins, with preliminary evidence suggesting that autonomy-supportive parenting may play a particularly important role in supporting identity differentiation among twins. Parent-child relational climate also demonstrated meaningful associations with self-esteem across all groups. These findings contribute to developmental psychology by integrating autonomy theory with twin research and highlight the potential value of individualized parenting strategies in promoting healthy identity development in twin populations.

Keywords: Adolescent self-esteem, Parental autonomy support, Twin development, Non-shared environment, Identity formation, Parent-child relationship

1. Introduction

While monozygotic twins share identical genetic blueprints, biological factors account for less than 50% of the variance in their individual identities (Marshall, 2023). These differences frequently trace back to how parents encourage their children to develop a unique sense of self until adolescence. Despite the abundance of literature on adolescent self-esteem, contemporary studies often neglect the unique developmental trajectory of twins. Typically, research on twins centers on the “nature versus nurture” debate. In fact, nature relating to genetics has been proven, by studies, to have a substantial impact on overall twin identity. Specifically, the role of parental behavior, a critical non-shared environmental factor, remains an

understudied determinant of self-conceptualization in twin households. Other studies on parenting strategies highlight the importance of supporting adolescents' individuality and its connection to self-esteem. There is no current research or correlation tying these effects to twins. A study from Cambridge reported that twins often exhibit higher levels of self-differentiation, the ability to maintain an autonomous sense of self, than non-twins. However, the analysis did not account for parental influence when comparing self-esteem outcomes between twins and non-twins (Marshall, 2023). Since non-twins do not face the same "paired identity" dynamic, the influence of parent-led individualism strategies may differ. Without understanding this, it is difficult to support parents of twins in ways to promote healthy self-esteem, separate from twin relationships. Consequently, current frameworks regarding twin development remain incomplete, as they fail to account for the moderating influence of parental individualization strategies. Studying how parental autonomy support relates to adolescent self-esteem is especially salient because this developmental period is marked by rapid identity change, making self-concept particularly sensitive to parental influence. Twins have a unique circumstance at this time, as they are facing constant pressure that leads to either competition or dependency. If parental strategies that emphasize individuality are shown to strengthen self-esteem, they could lead to better counseling and parenting approaches. This research contributes to developmental psychology by identifying how parental behaviors shape self-perception and other emotional factors, specifically in twins. The question of the extent to which parental effort to foster individualism in twins influences self-esteem development, compared to non-twins during adolescence, will be answered in this paper. The remainder of this paper reviews the relevant literature on parenting and twin development, outlines the methodological approach used in this study, presents the correlational findings, and concludes with a discussion of their implications, limitations, and directions for future research.

2. Literature Review

2.1 Parenting Behaviors as Predictors of Adolescent Self-Esteem

Across the literature, parenting behaviors emerged as consistently influential predictors of adolescent self-esteem. Developmental research showed that adolescence was a period in which parental warmth, structure, and autonomy support carried heightened developmental importance, shaping how adolescents evaluated their own competence. This foundational understanding was expanded by Peng et al. (2021), who identified self-esteem as a mediating mechanism linking parenting style to adolescent mental-health outcomes. Their findings strengthen the existing body

of knowledge by clarifying that self-esteem operates as the mediating process linking parenting style to psychological outcomes. However, they also share a defining limitation: these two studies evaluate adolescents as a generalized population. No current literature examines how these parenting behaviors manifest in twin households, where comparison is more frequent and shared identity is more entrenched. This gap becomes more salient when considering the distinct developmental context of twins.

2.2 Genetic and Environmental Contributions to Individual Differences

Understanding self-esteem development in twins also requires examining how genetic and environmental factors interact to shape identity. Plomin and Daniels (2011), whose work represents the foundational modern articulation of the non-shared environment, argue that environmental experiences, rather than genetics, largely explain why siblings raised in the same household differ from one another. Their updated analysis emphasizes adolescence as a developmental stage in which environmental divergence intensifies, making individual experiences especially consequential for identity formation. This perspective is critical for twin research, as it suggests that parental behaviors may serve as powerful differentiating forces even among genetically identical siblings. Unlike behavioral genetics studies that focus solely on trait heritability, Plomin and Daniels (2011) provide a theoretical justification for examining how parents may shape individuality in twins through differential treatment, autonomy support, or individualized expectations. However, their work remains conceptual: they do not identify which parental behaviors function as non-shared environmental contributors, nor do they test whether such influences affect self-esteem in twins differently than in non-twins. As a result, while genetics-environment research clarifies why environmental variation matters, it leaves the nature of parental influence empirically underexplored in twin populations.

2.3 Identity Formation in Twin Relationships

Research focused specifically on twins provides insight into the identity pressures that distinguish twin development from the experiences of non-twin adolescents. Akerman and Suurvee (2003) offer one of the most comprehensive longitudinal examinations of twin identity formation, following 32 twin pairs from infancy to age 16. Their findings show that cognitive differences between co-twins diminish over time. Yet identity differences become more pronounced during adolescence, particularly for monozygotic twins, a twin derived from a single ovum, who displayed more negative identity indicators on standardized assessments. This suggests that genetic similarity intensifies the difficulty of establishing a distinct sense of self. Additional research from Cambridge supports this conclusion, reporting elevated self-differentiation among twins as they deliberately work to separate themselves from the “twin identity” imposed by external labeling (Marshall, 2023). These studies collectively reveal that twins face developmental pressures unrelated to those experienced by non-twins, including heightened comparison, expectations of uniformity, and challenges in asserting individuality. However, neither study examines parental behavior. Identity outcomes are reported as inherent features of twin dynamics rather than as processes shaped by parenting. This omission restricts the field’s understanding of potential parental strategies that may alleviate or exacerbate identity challenges in twin households.

2.4 Psychological Scales to Measure Self-Esteem and Parental Autonomy

This study employs three validated psychological instruments - the Rosenberg Self-Esteem Scale (RSE), the Perceived Parental Autonomy Support Scale (P-PASS), and the Parent-Child Conflict subscale of the Parental Environment Questionnaire (PEQ) - to quantify the constructs central to understanding how parental behaviors relate to adolescent self-esteem. The P-PASS measures adolescents' perceptions of autonomy-supportive versus controlling parenting using a 7-point agreement scale (Mageau, 2015). Autonomy support is consistently linked to healthier identity development and stronger self-esteem, offering a behavioral lens on parental influence that extends beyond genetic explanations of adolescent differences. This aligns with Plomin and Daniels' (2011) argument that non-shared environmental experiences, such as differential parental treatment, shape individual outcomes even among genetically similar siblings. However, neither study examines whether these dynamics operate differently in twin households, leaving a gap that this research addresses. Self-esteem was assessed using the Rosenberg Self-Esteem Scale (RSE), a 10-item Guttman-style measure with strong psychometric properties, including a reproducibility coefficient R^2 of .92 and test-retest correlations between .85 and .88 (Rosenberg, 1979). The RSE provides a stable, widely used metric for comparing self-esteem across sibling groups, allowing this study to evaluate whether autonomy support predicts self-esteem similarly for twins and non-twins. To capture the broader relational climate, the study incorporates the Parent-Child Conflict scale of the Parental Environment Questionnaire (PEQ). The PEQ consists of 12 items rated on a 4-point scale, with higher scores indicating lower conflict. Recent research demonstrates exceptionally high internal reliability for this scale (Cronbach's $\alpha = .982$), confirming its suitability for assessing parent-child relational dynamics (Wong et al., 2023). While the PEQ has been used to examine conflict and psychological distress in parents, it has not been applied to compare relational environments across twin and non-twin families. These three validated scales contribute to the body of knowledge by describing three commonly used psychological measures and how scores are interpreted, providing an understanding of how self-esteem and parental autonomy are measured. More importantly, they allow this study to address a clear gap in the literature: although prior research has examined parenting style, autonomy support, and twin identity separately, no existing work integrates these constructs to test whether parental behaviors relate to self-esteem differently for twins than for non-twins.

2.5 Initial Assumptions + Understanding the Gaps in Research

Across all four thematic areas, existing research supports several consistent conclusions regarding adolescent development. First, studies examining parenting style demonstrate that parental warmth, autonomy support, and emotional responsiveness contribute to stronger levels of adolescent self-esteem (Peng et al., 2021). Second, developmental psychology research on environmental influences establishes that even genetically identical individuals diverge in identity formation due to non-shared environmental experiences, including parental behavior (Plomin & Daniels, 2011). Third, research focused specifically on twins shows that twin

adolescents encounter unique identity pressures, such as increased comparison, external labeling, and expectations of similarity, that distinguish their developmental context from that of non-twins (Akerman & Suurveen, 2003). Finally, studies on autonomy development highlight that autonomy-restrictive parenting impedes identity formation and prolongs dependency (Shah et al., 2022), suggesting that parental individualization strategies play a role in strengthening adolescents' sense of self. Together, these findings lead to several initial assumptions. The first assumption is that parental behavior influences self-esteem across adolescent populations, regardless of genetic similarity. The second assumption is that twins, due to their unique social and familial positioning, may experience self-esteem differently than non-twin adolescents, even if raised by the same parents. The third assumption is that parents may unintentionally contribute to identity challenges in twins if individuality is not actively promoted. These assumptions are logically derived from existing research but remain untested in a combined framework.

Despite the coherence across these themes, a clear gap in the body of knowledge persists. Studies on parenting style do not examine twin-specific self-esteem outcomes. Studies on twin identity focus on developmental trajectories but omit the role of parental behavior. Studies on autonomy development do not include twin comparisons. As a result, the given body of knowledge fails to investigate how parental individualization strategies function within twin households, nor whether these strategies influence self-esteem differently for twins than for non-twins. The study conducted in this research paper will address this gap by examining how parental efforts to promote individuality relate to adolescent self-esteem in twin and non-twin populations. This integrated approach amplifies prior work by applying parenting and autonomy-development factorizations to a population that has been largely excluded from empirical analysis. Ultimately, creating the tentative hypothesis that there will be a correlation between self-esteem and parental influence in both twins and non-twins, to a significant degree.

3. Methods

3.1 Statement of Ethics:

Prior to the start of the study, IRB approval was obtained, and consent forms for participants under 18 were signed by a parent or guardian. All identifying data were kept anonymous and were removed to protect participant privacy. Survey responses were collected through Google Forms, which remained password-protected and accessible only to the researcher. No names, emails, or contact information were stored alongside survey responses. All identifying data were retained only for the duration of the research process and were permanently deleted upon completion of the paper to ensure participant confidentiality and compliance with ethical research standards.

A quantitative cross-correlational methodology was utilized to test the relationship between adolescent self-esteem, perceived parental autonomy levels (P-PASS), and the parent-child relational environment (PEQ), identifying whether these variables functioned

differently for twins compared to non-twins. This method aligned with the purpose of the study, which was to determine whether parental individualization strategies influenced self-esteem differently across sibling types. Because the study focused on identifying statistical relationships rather than establishing causation, correlational methods were deemed appropriate and feasible.

To gather the necessary data, three validated psychological instruments were administered. First, adolescent self-esteem was measured using the Rosenberg Self-Esteem Scale (RSE), a ten-item Likert-style instrument widely used in adolescent psychology research for its reliability and strong construct validity. Parental individualization and autonomy support were measured using the Perceived Parental Autonomy Support Scale (P-PASS), which assessed the degree to which adolescents perceive their parents as autonomy-supportive or autonomy-controlling. Lastly, the Parental Environment Questionnaire (PEQ) captured the parents' perspective on the relational climate, specifically levels of parent-child conflict. These instruments directly measured the constructs central to my research and allowed for the calculation of correlations between parental behaviors-perceived by both the child and parent-and self-esteem outcomes

3.2 Research Procedure and Statistical Framework

Twin participants were recruited through social media, twin organizations, and local outreach. Once twin participants were acquired, they were asked to complete surveys along with the families of non-twins: parents, siblings, and adolescents. After all data were collected, the correlational analysis was conducted in the following order.

First, descriptive statistics were used to summarize self-esteem levels, autonomy support scores, and parental environment questionnaire scores. These statistics were sorted by families of identical twins, fraternal twins, and non-twins to provide an initial overview of group differences.

Second, scatterplots were created to visualize the relationships between self-esteem (RSE) and both parental autonomy support (P-PASS) and parental environment (PEQ). Google Sheets automatically generated R^2 values for each scatterplot, which indicate the proportion of variance in self-esteem explained by each parental factor. These R^2 values were used solely for visualization and to illustrate the linear fit of each relationship for twins and non-twins.

Third, Pearson correlation coefficients were calculated using the CORREL function to examine the strength and direction of the relationships between parental autonomy support, parental environment, and self-esteem within each group. These r -values were displayed in a heat map to allow for direct comparison of correlational patterns across twin and non-twin populations.

In summary, the three statistical tools used in this study were conducted to gain a full scope of how parental factors related to adolescent self-esteem across sibling groups. Descriptive statistics established the overall distribution of self-esteem, autonomy support, and parent-child environment scores (supported by organized group summaries). R^2 values from scatterplots then

offered an initial visual indication of how strongly parental autonomy support and parental environment predicted self-esteem (supported by Google Sheets trendline outputs). Pearson correlation coefficients provided the final quantitative measure of the strength and direction of these relationships within each group (supported by CORREL-generated values displayed in the heat map). Together, these tools created a cohesive analytical framework for evaluating whether parental behaviors related to self-esteem differently for twins and non-twins.

An alternative method initially considered was a longitudinal case study similar to Akerman and Suurveen's (2003) multi-year tracking of twins. While this approach offered rich developmental insight, it was limited in generalizability and was not feasible within the time and resource constraints of a high school project. A second alternative involved conducting a thematic analysis of free-response questions from twins and non-twins. Although these items were included in the survey, many responses were incomplete or too brief to categorize reliably, preventing a systematic qualitative analysis.

For these reasons, the correlational design was deemed more appropriate for the goals of the study. By combining validated psychological scales with structured group comparisons, this methodology directly addressed the gap identified in the literature review: there was no existing research examining how parental individualization strategies related to self-esteem differently for twins and non-twins. This design enabled reliable measurement of core psychological variables and produced evidence that contributed to existing theories of parenting and autonomy while addressing the applied question of whether twinship moderated the relationship between parental behavior and adolescent self-esteem.

RSE

Please record the appropriate answer for each item, depending on whether you Strongly agree, agree, disagree, or strongly disagree with it.

1 = Strongly agree
2 = Agree
3 = Disagree
4 = Strongly disagree

- ____ 1. On the whole, I am satisfied with myself.
- ____ 2. At times I think I am no good at all.
- ____ 3. I feel that I have a number of good qualities.
- ____ 4. I am able to do things as well as most other people.
- ____ 5. I feel I do not have much to be proud of.
- ____ 6. I certainly feel useless at times.
- ____ 7. I feel that I'm a person of worth.
- ____ 8. I wish I could have more respect for myself.
- ____ 9. All in all, I am inclined to think that I am a failure.
- ____ 10. I take a positive attitude toward myself.

Figure 1. The Rosenberg Self-Esteem Scale (RSE), a 10-item instrument that was used to measure global self-worth. Items were rated on a 4-point Likert scale ranging from Strongly Agree to Strongly Disagree. Five items were positively worded and five were reverse-scored. After reverse-scoring the appropriate items, responses were summed to produce a total self-esteem score, with higher scores indicating higher self-esteem.

Do not agree at all 1	Hardly agree 2	Slightly agree 3	Somewhat agree 4	agree 5	Strongly agree 6	Very strongly agree 7		
BE CAREFUL, the order of responses for your mother and father changes for each item.								
WHEN I WAS GROWING UP ...								
1. My parents gave me many opportunities to make my own decisions about what I was doing.	Mother	1	2	3	4	5	6	7
	Father*	1	2	3	4	5	6	7
2. When my parents asked me to do something, they explained why they wanted me to do it.	Father*	1	2	3	4	5	6	7
	Mother	1	2	3	4	5	6	7
3. When I refused to do something, my parents threatened to take away certain privileges in order to make me do it.	Mother	1	2	3	4	5	6	7
	Father*	1	2	3	4	5	6	7
4. My point of view was very important to my parents when they made important decisions concerning me.	Father*	1	2	3	4	5	6	7
	Mother	1	2	3	4	5	6	7
5. My parents refused to accept that I could want simply to have fun without trying to be the best.	Mother	1	2	3	4	5	6	7
	Father*	1	2	3	4	5	6	7
6. When my parents wanted me to do something differently, they made me feel guilty.	Father*	1	2	3	4	5	6	7
	Mother	1	2	3	4	5	6	7
7. My parents encouraged me to be myself.	Mother	1	2	3	4	5	6	7
	Father*	1	2	3	4	5	6	7
8. Within certain limits, my parents allowed me the freedom to choose my own activities.	Father*	1	2	3	4	5	6	7
	Mother	1	2	3	4	5	6	7
9. When I was not allowed to do something, I usually knew why.	Mother	1	2	3	4	5	6	7
	Father*	1	2	3	4	5	6	7
10. I always had to do what my parents wanted me to do, if not, they would threaten to take away privileges.	Father*	1	2	3	4	5	6	7
	Mother	1	2	3	4	5	6	7
11. My parents believed that, in order to succeed, I always had to be the best at what I did.	Mother	1	2	3	4	5	6	7
	Father*	1	2	3	4	5	6	7
12. My parents made me feel guilty for anything and everything.	Father*	1	2	3	4	5	6	7
	Mother	1	2	3	4	5	6	7
13. My parents were able to put themselves in my shoes and understand my feelings.	Mother	1	2	3	4	5	6	7
	Father*	1	2	3	4	5	6	7
14. My parents hoped that I would make choices that corresponded to my interests and preferences regardless of what theirs were.	Father*	1	2	3	4	5	6	7
	Mother	1	2	3	4	5	6	7
15. When my parents wanted me to do something, I had to obey or else I was punished.	Mother	1	2	3	4	5	6	7
	Father*	1	2	3	4	5	6	7
16. My parents were open to my thoughts and feelings even when they were different from theirs.	Father*	1	2	3	4	5	6	7
	Mother	1	2	3	4	5	6	7
17. In order for my parents to be proud of me, I had to be the best.	Mother	1	2	3	4	5	6	7
	Father*	1	2	3	4	5	6	7
18. When my parents wanted me to act differently, they made me feel ashamed in order to make me change.	Father*	1	2	3	4	5	6	7
	Mother	1	2	3	4	5	6	7
19. My parents made sure that I understood why they forbid certain things.	Mother	1	2	3	4	5	6	7
	Father*	1	2	3	4	5	6	7
20. As soon as I didn't do exactly what my parents wanted, they threatened to punish me.	Father*	1	2	3	4	5	6	7
	Mother	1	2	3	4	5	6	7
21. My parents used guilt to control me.	Mother	1	2	3	4	5	6	7
	Father*	1	2	3	4	5	6	7
22. My parents insisted that I always be better than others.	Father*	1	2	3	4	5	6	7
	Mother	1	2	3	4	5	6	7
23. When I asked why I had to do, or not do, something, my parents gave me good reasons.	Mother	1	2	3	4	5	6	7
	Father*	1	2	3	4	5	6	7
24. My parents listened to my opinion and point of view when I disagreed with them.	Father*	1	2	3	4	5	6	7
	Mother	1	2	3	4	5	6	7

Figure 2. The Perceived Parental Autonomy Support Scale (P-PASS), which was used to assess the extent to which adolescents perceived their parents as supporting their autonomy. The scale included items rated on a 7-point Likert scale from Strongly Disagree to Strongly Agree. Negatively phrased items were reversed-scored, and all responses were averaged to generate a continuous autonomy-support score, with higher values reflecting greater perceived parental autonomy support

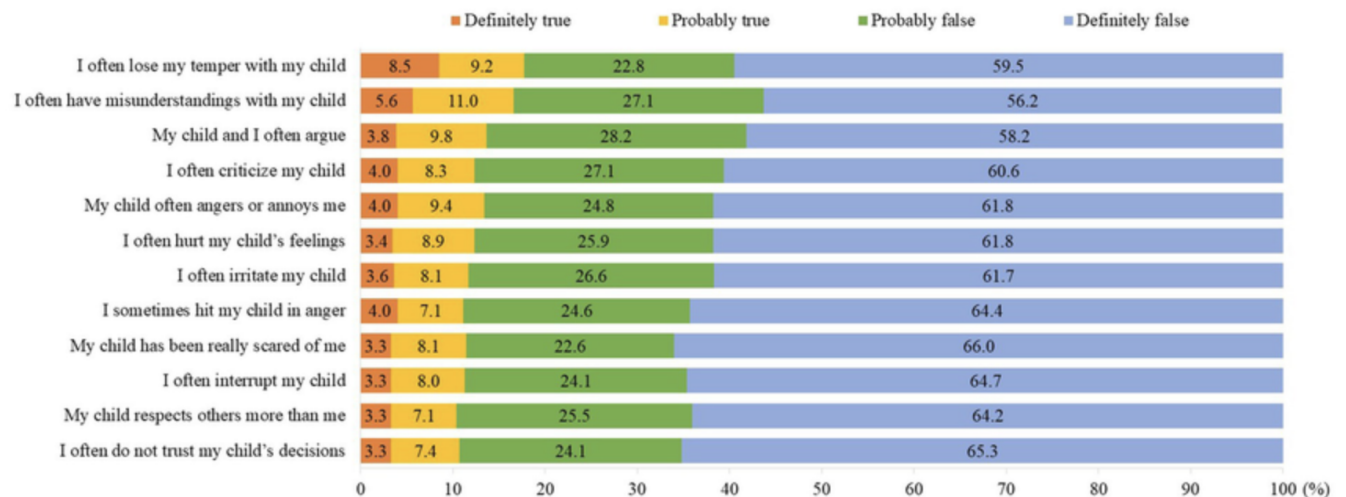


Figure 3. The Parent-Child Relationship subscale of the Parental Environment Questionnaire (PEQ), which was used to measure the emotional quality of the parent-adolescent relationship. Items were rated on a 4-point Likert scale ranging from Almost Never to Almost Always. Negatively worded items were reversed-scored, and all items were averaged to produce a composite score, with higher scores indicating a more positive parent-child relational environment.

Figures 1-3 portrayed the likert scales utilized on the participants. With Figure 1 (RSE) used on all participants; Figure 2 (P-PASS) used on twins, non-twins and siblings; Figure 3 (PEQ) completed by the parents of twins and non-twins. Based on the data, two master tables were created, as shown in Figure 4 (twins) and Figure 5 (non-twins), which converted participants' scores into numerical values. Figures 1–3, as well as the scoring procedures previously described in Section 2.4, outlined how the data were converted into numerical form, a step necessary to conduct the correlational analysis.

Participant ID	Group	Gender	RSE Score	P-PASS AVG Score	PEQ Score
1A	MZ	F	27	5.8	N/A
2A	MZ	F	25	5.2	N/A
3A	P-F	M	28	N/A	3.4
4A	P-M	F	27	N/A	3.3
5B	DZ	M	29	6.0	N/A
6B	DZ	F	26	5.5	N/A
7B	S-T	F	29	6.1	N/A
8B	P-F	M	27	N/A	3.6
9B	P-M	F	27	N/A	3.6
10C	MZ	M	26	5.7	N/A
11C	MZ	M	27	5.9	N/A
12C	S-T	F	29	6.2	N/A
13C	P-F	M	29	N/A	3.4
14C	P-M	F	25	N/A	3.2
15D	DZ	F	23	5.0	N/A
16D	DZ	M	27	5.9	N/A
17D	S-T	M	29	6.5	N/A
18D	P-F	M	27	N/A	3.5
19D	P-M	F	27	N/A	3.6

Figure 4. The master table contained all numerical data for twin participants and their family members. Each row represented a single participant, with group abbreviations indicating MZ (monozygotic twin), DZ (dizygotic twin), S-T (sibling of a twin), P-F (father), and P-M (mother). Each of the last three columns corresponded to one of the three psychological scales: Rosenberg Self-Esteem Scale (RSE), Perceived Parental Autonomy Support Scale (P-PASS), and the Parent-Child Relationship subscale of the Parental Environment Questionnaire (PEQ). All responses were converted into numerical values using the scoring procedures outlined in Figures 1–3, including reverse-scoring where required. The table consolidated these processed scores into a single dataset that was used for subsequent correlational analysis.

Participant ID	Group	Gender	RSE Score	P-PASS AVG Score	PEQ Score
20F	NT	M	29	6.7	N/A
21F	NT	M	27	6.3	N/A
22F	P-F	M	26	N/A	3.4
23F	P-M	F	27	N/A	3.6
24G	NT	F	27	6.6	N/A
25G	NT	M	28	6.6	N/A
26G	P-F	M	26	N/A	3.5
27G	P-M	F	27	N/A	3.4

Figure 5. Master table for non-twin participants. Similar to the twin dataset, each row corresponded to a non-twin adolescent or a family member. All items were converted into numerical values, ensuring consistency across sibling groups. This table served as the parallel dataset to Figure 4, used to conduct the correlational analysis between parental factors and self-esteem in non-twin families.

With the twin and non-twin datasets organized into their respective master tables, the next step involved visualizing the relationships among the variables. To accomplish this, scatterplots were generated for each group, allowing the linear association between parental autonomy support, parental environment, and self-esteem to be examined. Each scatterplot

included a trendline accompanied by an R^2 value, which provided an indication of how closely the data points aligned with the fitted line- that is, how much of the variation in self-esteem was accounted for by the parental factor being examined. These visualizations formed the basis for the comparative analysis and provided validation, presented in Figures 6-9.

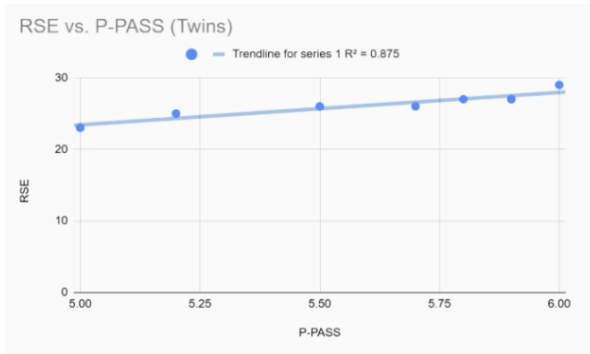


Figure 6. Scatterplot displayed the relationship between Rosenberg Self-Esteem (RSE) scores and P-PASS average scores for twin participants, including a linear trendline with an R^2 value of 0.875.

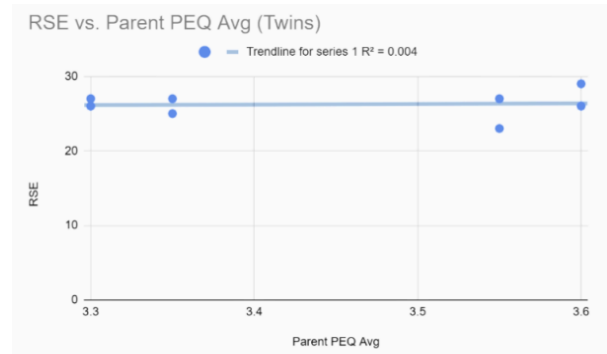


Figure 7. Scatterplot displayed the relationship between Rosenberg Self-Esteem (RSE) scores and Parent PEQ average scores, with an R^2 value of 0.004.

Figures 8-9 presented the same variable comparisons shown in Figures 6 and 7, but were applied to the non-twin sample to illustrate the corresponding relationships within that group.

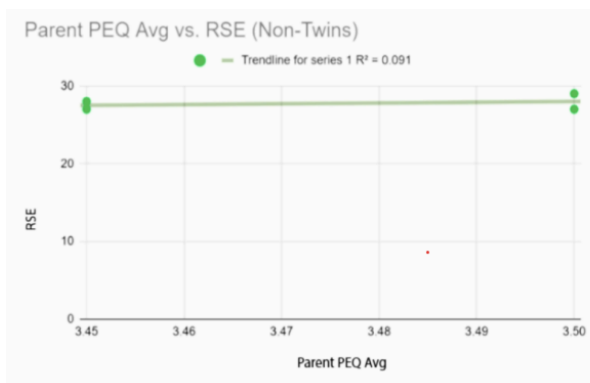


Figure 8. Scatterplot illustrated the association between Rosenberg Self-Esteem (RSE) scores and Parent PEQ averages for non-twin participants, shown with a R^2 value of 0.091.

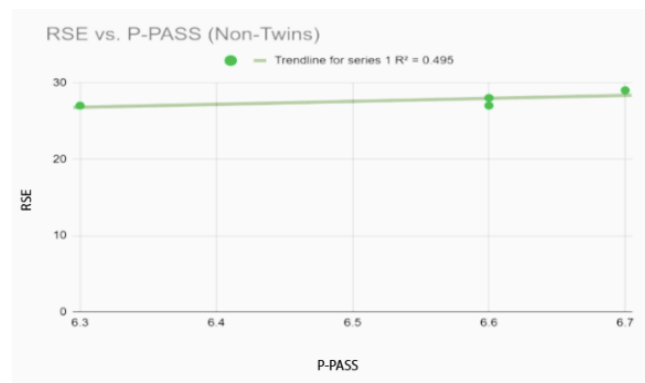


Figure 9. Scatterplot illustrated the relationship between Rosenberg Self-Esteem (RSE) scores and P-PASS average scores for non-twin participants, shown with a R^2 value of 0.495.

To prepare the dataset for correlational analysis, a matched comparison table was created to ensure equal numbers of twin and non-twin participants with complete data. Because Pearson correlation required paired lists of equal length, four twins and four non-twins with complete RSE, P-PASS, and PEQ scores were selected and were organized into a single table (Figure 10). All values were transferred using the master tables (Figures 4–5). PEQ scores were assigned based on each participant's corresponding parent report. This matched dataset served as the foundation for generating the correlation coefficients displayed in the heat map (Figure 11).

Family	ID	Zygosity	RSE	P-PASS AVG	Parent PEQ Avg
A	1A	MZ	27	5.8	3.35
A	2A	MZ	25	5.2	3.35
B	5B	DZ	29	6	3.6
B	6B	DZ	26	5.5	3.6
F	20F	NT	29	6.7	3.5
F	21F	NT	27	6.3	3.5
G	24G	NT	27	6.6	3.45
G	25G	NT	28	6.6	3.45

Figure 10. The resulting table served as the foundation for calculating the nine Pearson correlation coefficients used in the heat map (Figure 11), enabling a structured examination of how parental autonomy support and parental environment related to self-esteem across sibling types.

After the data were organized into parallel columns for RSE, P-PASS, and parent PEQ scores for both twins and non-twins, each pair of variables was compared using the CORREL() function. For example, the correlation between non-twin RSE and twin RSE was calculated using the formula =CORREL(D6:D9, D2:D5), where the first range represented the non-twin scores and the second range represented the matched twin scores. This procedure was repeated for all nine cross-group combinations, producing a complete 3×3 matrix of Pearson coefficients.

Cross-Group Correlation Heat Map (Twins vs. Non-Twins)

Pearson correlation coefficients comparing RSE, P-PASS, and PEQ across sibling types.

Correlation (r value) -1 0 1

Non-Twins

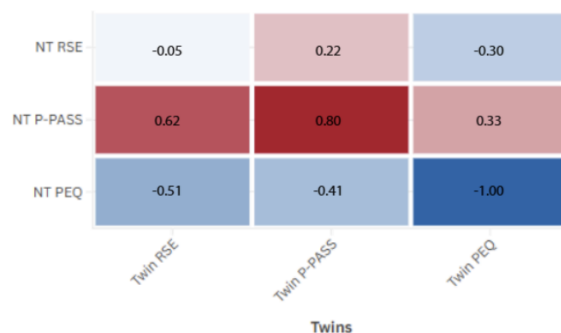


Figure 11. Summary graphic presented the study methodology organized by cross-group scale classification. Correlations between twins and non-twins were depicted by color, indicating the strength of relationships and highlighting the similarities and differences across constructs.

Taken together, this methodological design provided a clear and replicable framework for examining how parental individualization strategies related to adolescent self-esteem across sibling groups. By using only validated psychological scales and a matched-pair correlational structure, the study ensured consistent measurement and statistically balanced comparisons between twins and non-twins. Matching participants across groups strengthened internal validity by allowing Pearson correlations to be calculated from parallel datasets of equal length, meeting the statistical requirements for cross-group analysis.

This quantitative approach directly addressed the gap identified in the scholarly review: although prior studies had examined parenting style, autonomy support, and twin identity separately, none had tested how these constructs interacted within a unified statistical model or whether these relationships differed for twins compared to non-twins. By organizing the data into aligned variables and computing a full matrix of cross-group correlations, the methodology enabled a focused evaluation of whether twinship moderated the relationship between parental behavior and adolescent self-esteem. This positioned the study to generate preliminary but meaningful insights, setting the foundation for the correlational findings presented in the findings.

4. Findings and Data Analysis

This study examined the relationship between parental individualization strategies and adolescent self-esteem in twin and non-twin populations using three validated psychological instruments: the Rosenberg Self-Esteem Scale (RSE), the Perceived Parental Autonomy Support Scale (P-PASS), and the Parental Environment Questionnaire (PEQ). The final dataset included monozygotic and dizygotic twins as well as non-twins, each linked to at least one parent. Figures 4 and 5 summarize the core variables, showing that most adolescents scored in the high self-esteem range, with P-PASS scores clustering between 5.0 and 6.7 and PEQ scores around the mid-3 range. These descriptive statistics suggest generally positive self-esteem and moderately high perceived autonomy support across the sample.

The correlational analysis revealed distinct patterns between groups. Among twins, self-esteem and perceived parental autonomy support were strongly positively correlated. Figures 6-7 display a tight, upward-sloping relationship ($R^2 = 0.875$), indicating low variance and a strong association between perceived autonomy support and higher self-esteem. In contrast, the relationship between RSE and PEQ in twins (Figure 8-9) were negligible ($R^2 = 0.004$), suggesting that parent-reported environmental measures were not meaningfully associated with twin self-esteem.

For non-twins, the relationship between RSE and P-PASS was moderately positive (Figure 10; $R^2 = 0.495$), indicating a weaker and more variable association compared to twins. The relationship between PEQ and RSE in non-twins was small but present ($R^2 = 0.091$), suggesting that the broader parental environment may play a slightly greater role for non-twins than for twins.

Figure 11 presents a heat map summarizing cross-group correlations among RSE, P-PASS, and PEQ. The strongest relationship is observed between twin and non-twin P-PASS scores, indicating substantial consistency in perceived autonomy support across groups. In contrast, correlations involving PEQ, particularly between twin and non-twin PEQ, are negative, suggesting divergence in how parents report the environment across sibling types. Relationships involving RSE are comparatively weak, with non-twin RSE showing minimal association with twin variables. Overall, these patterns indicate that autonomy support (P-PASS) is the most stable construct across sibling types, whereas parental environment (PEQ) shows greater divergence. Self-esteem (RSE) demonstrates limited cross-group correspondence, suggesting it is less uniformly shared across sibling contexts. In other words, this means that parental autonomy support plays a very prominent role in influencing self-esteem levels in twin adolescents, while not being a significant determinant in non-twin adolescents, partially aligning with the initial hypothesis.

5. Conclusion

5.1 New Understandings + Evaluation of Initial Assumptions

This study was guided by three primary assumptions: that parental behavior broadly influences adolescent self-esteem, that twins may experience self-esteem differently due to identity-related pressures, and that parental individualization strategies may be particularly important in twin households. Together, these assumptions shaped the central research question: to what extent does parental autonomy support adolescent self-esteem in twins compared to non-twins? The findings partially support and refine this question. Parental autonomy support showed a strong positive relationship with self-esteem in twins, while the relationship was more moderate among non-twins, suggesting that autonomy-supportive parenting may play a comparatively larger role in shaping self-esteem for adolescents navigating the paired-identity dynamics of twinship.

The strong positive association between P-PASS and RSE in twins supports the hypothesis that parental autonomy support is a key correlate of self-esteem in adolescence. This finding aligns with prior research showing that autonomy-supportive parenting promotes healthier identity development and stronger self-esteem (Peng et al., 2021). It also complements twin-identity research indicating that twins face heightened comparison and identity-related pressures (Akerman & Suurveen, 2003), suggesting that autonomy-supportive parenting may be especially impactful for adolescents working to differentiate themselves within a twin dyad. When twins perceive their parents as encouraging individuality and independent decision-making, their self-esteem appears particularly robust.

For non-twins, the weaker but still positive relationship between P-PASS and RSE suggests that autonomy support is important across sibling types, but not equally so. In this population, self-esteem seems less tightly bound to autonomy support and somewhat more diffusely related to the broader parental environment (PEQ). This detail refines the initial assumption that parental behavior influences self-esteem regardless of genetic similarity by indicating that which parental behaviors matter most may differ by sibling context. The near-zero relationship between PEQ and RSE in twins challenges any simplistic assumption that a generally positive or negative parental environment, as reported by parents, directly shapes twin self-esteem. Rather, the data suggest that twins' self-esteem is more sensitive to the degree of autonomy they personally perceive than to how parents globally characterize the home environment. This pattern aligns with non-shared environment theory (Plomin & Daniels, 2011), which emphasizes that subjective experiences, rather than objective parental reports, explain why siblings raised in the same household diverge in psychological outcomes. For twins, this divergence appears to center specifically on perceived autonomy support.

5.2 Implications

Following the conclusions drawn from the data, both theoretical and practical implications can be made. Theoretically, they suggest that twinship may moderate the relationship between parenting and self-esteem by altering which parental behaviors are most influential. This is consistent with the Plomin and Daniels' (2011) argument that subjective experiences, rather than shared household conditions, drive sibling differences. Because twins often face heightened comparison and identity pressure (Akerman & Suurvee, 2003), practices such as explaining reasons for rules, encouraging independent choices, and acknowledging each twin's perspective may help them build a more differentiated and confident sense of self.

Practically, parents of twins may benefit from intentionally emphasizing individualization, by allowing each twin to pursue distinct interests, avoiding performance-based comparisons, and recognizing their unique strengths. These strategies align with the broader literature, showing that autonomy-supportive parenting promotes healthier identity development and stronger self-esteem (Peng et al., 2021). For non-twins, the more moderate correlations suggest that both autonomy support and the general parent-child environment contribute to self-esteem, indicating that a wider range of parenting behaviors may be relevant.

Lastly, for school counselors, pediatricians, and family therapists, these results highlight the importance of asking adolescents, not just parents, how much autonomy they feel they have at home. This is especially important for twins, whose self-esteem may depend less on the overall family climate and more on whether they feel individually recognized within it.

5.3 Limitations

Several limitations affect the interpretation of this study. The sample size was relatively small, particularly when subdivided into twin subgroups, limiting statistical power and the stability of correlation estimates. The strong association observed in twins may be influenced by restricted variability and sample size.

Additionally, the cross-sectional design prevents causal inference. While autonomy support is associated with higher self-esteem, it is also possible that adolescents with higher self-esteem perceive their parents more positively. Furthermore, self-report bias may have led participants to provide responses that did not accurately reflect their typical attitudes or behaviors. Longitudinal research is needed to clarify directionality.

The PEQ data were incomplete and unevenly distributed, which may have contributed to weak associations. Furthermore, PEQ reflects parent self-report rather than adolescent perception, potentially reducing its relevance to adolescent self-esteem. Cultural, socioeconomic, and family-structure diversity were not systematically controlled, limiting external validity. The sample was recruited through social media and twin organizations, which may introduce selection bias and limit generalizability. Finally, the study did not differentiate between monozygotic and dizygotic twins or account for gender composition, despite evidence that these factors may influence identity development.

5.4 Future Directions

Future research can build on this pilot in several key ways. Including more diverse samples, such as a larger number of twin and non-twin families, with intentional stratification by zygosity, gender composition, and socioeconomic background, would allow for more precise estimates and subgroup comparisons.

Additionally, longitudinal designs would clarify whether autonomy-supportive parenting predicts changes in self-esteem, and whether this trajectory differs by sibling type. Adding scales or interview items that directly assess parental individualization strategies, such as separate activities, differentiated expectations, and avoidance of comparison, would more directly test the hypothesis that such strategies buffer identity pressures in twins. Combining adolescent reports, parent reports, and possibly observational coding of parent-child interactions would reduce shared-method bias and better capture the non-shared environment processes theorized in the literature. Overall, this pilot study provides preliminary evidence that perceived parental autonomy support is a particularly strong correlate of self-esteem in twins, while non-twins exhibit a more distributed pattern of influences. These findings highlight parental individualization as a promising area for future research on adolescent self-esteem.

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Therapeutic Potential of MDMA-Based Therapy in Rumination Treatment

Julia Summer

Abstract: Rumination, characterized by persistent and repetitive negative thinking, is a debilitating feature of many psychological disorders and can contribute to the development of additional mental health complications. In recent years, growing interest has emerged in the therapeutic potential of MDMA (3,4-methylenedioxymethamphetamine), a Schedule I controlled substance traditionally associated with recreational use. Although MDMA-assisted therapy has demonstrated promising results in the treatment of post-traumatic stress disorder (PTSD), its applicability to rumination remains underexplored despite shared underlying mechanisms. This paper reviews current neurobiological and psychological evidence to evaluate the potential efficacy of MDMA-assisted therapy in reducing ruminative thought patterns. Findings from PTSD research suggest that MDMA-assisted therapy may produce significant and sustained symptom reduction, potentially through decreased amygdala activity and reduced functional connectivity with the posterior cingulate cortex (PCC), a region implicated in self-referential processing. Additionally, MDMA's capacity to enhance emotional openness and facilitate fear extinction may promote deeper engagement in psychotherapy and disrupt maladaptive cognitive loops. While direct research on rumination is limited, existing evidence indicates promising therapeutic potential, warranting further investigation.

Keywords: MDMA, Rumination, MDMA assisted therapy, Psychotherapy

Rumination, also known as negative thought loops, is defined as repetitive, prolonged, and recurrent negative thinking about one's self, feelings, personal concerns, and upsetting experiences (Watkins & Roberts, 2020). Rumination keeps the brain in a constant state of perceived threat, even when no real danger is present. By repeatedly reactivating emotional, traumatic, and distressing memories, rumination may prolong physiological stress responses. Neurologically, this may interfere with the downregulation of the HPA axis (Hypothalamic–Pituitary–Adrenal axis). Downregulation is the process through which the body's stress-response system returns to a regulated or resting state. This is important to note because prolonged activity of the HPA axis, the body's central stress alarm system, has been linked to various psychiatric disorders, including depression, anxiety, panic disorders, and phobias (Norris et al., 2025). In addition, research suggests that prolonged HPA-axis activation may contribute to the onset and progression of neurodegenerative diseases, including Alzheimer's disease and other forms of dementia, making this a prevalent public health concern (Vyas et al., 2016).

Current treatments for rumination include psychotherapeutic approaches such as cognitive behavioral therapy (CBT). Within CBT, individuals are guided to identify and challenge maladaptive or unwanted thought patterns while simultaneously increasing engagement in rewarding and adaptive behaviors. This process aims to reduce the persistence of negative thinking cycles and promote more constructive cognitive and behavioral responses. In addition, there is a more specialized approach known as rumination-focused cognitive behavioral therapy. This form of therapy is designed specifically to target ruminative thinking patterns. It incorporates functional analysis, a process used to understand how and why an individual thinks in a particular way, to help distinguish between helpful and unhelpful methods of processing difficulties. CBT emphasizes the development of strategies that encourage more adaptive and constructive thought processes (Watkins & Roberts, 2020). However, these treatments may not be effective for all individuals for a variety of reasons, including reluctance to disclose personal experiences, treatment resistance, and other contributing factors. Numerous variables may influence treatment effectiveness.

One potential treatment for adults experiencing rumination that will be explored in this paper is MDMA (3,4-methylenedioxymethamphetamine)-assisted therapy. Although MDMA-assisted therapy has already been studied and has demonstrated promising results in the treatment of PTSD (post-traumatic stress disorder), its potential benefits for other mental health conditions remain less extensively investigated. This question is important because expanding MDMA's clinical applications may provide additional treatment options for patients who struggle with persistent negative thought patterns. Investigating its use beyond PTSD addresses an area that has received comparatively less scientific attention and may expand current knowledge.

1. Background: MDMA and Its Effects

When MDMA was first synthesized in 1912, researchers later explored its potential therapeutic applications because it was believed to facilitate communication during psychotherapy. In 1985, the Drug Enforcement Administration (DEA) classified MDMA as a Schedule I substance following concerns regarding misuse. However, the U.S. Food and Drug Administration (FDA) approved Phase I clinical trials of MDMA during the mid-1990s (Riaz et al., 2023). Phase I trials represent the initial stage of human testing and are designed to evaluate safety, metabolism, absorption, and excretion. As of 2026, MDMA is undergoing Phase III clinical trials, the final stage of testing before potential FDA approval.

MDMA is a synthetic substance produced in laboratory settings and is commonly ingested in tablet or capsule form. It is classified as a psychoactive substance and primarily affects the brain's serotonergic system. When ingested, serotonin—the neurotransmitter associated with positive mood—is released into the synapse in response to neural signaling, binds to receptors on neighboring neurons, and is subsequently removed through reuptake transporters. MDMA enters serotonergic neurons through these transporters, triggering a substantial release of serotonin while simultaneously inhibiting its reuptake, resulting in

increased receptor activation. This heightened serotonergic activity is associated with changes in mood, social bonding, and sensory perception and is often described as producing elevated feelings of well-being, energy, alertness, and interpersonal connectedness (National Institute on Drug Abuse, 2024). The National Institute on Drug Abuse further reports that users may experience increased sensitivity to sensory stimuli and that the effects typically peak within 15–30 minutes and last approximately three hours (National Institute on Drug Abuse, 2024).

2. What Is MDMA-Assisted Psychotherapy?

MDMA-assisted psychotherapy is a form of psychotherapy that incorporates the administration of a controlled dose of MDMA. Typically, it involves single-dose MDMA administration once per month on two or three occasions, combined with preparatory and integrative psychotherapy sessions. The inclusion of MDMA is intended to facilitate openness and engagement with traumatic or emotionally challenging experiences. MDMA reduces the reuptake of monoamines such as serotonin, dopamine, and norepinephrine, which may contribute to reductions in anxiety and increases in interpersonal connectedness. These effects may enhance the therapeutic process and improve treatment outcomes (Parrott, 2014).

3. Literature Review and Neurobiological Evidence

Current research supports the idea that MDMA-assisted therapy may reduce PTSD symptoms and, in some cases, lead to complete remission when administered in clinical settings. Multiple studies have demonstrated significant reductions in PTSD symptoms following only two to three administrations of MDMA combined with several nondrug psychotherapy sessions, with long-lasting remission reported in some participants (Fedducia & Mithoefer, 2018). Similar to PTSD, rumination involves repetitive cognition and anxiety-related thought patterns. During PTSD treatment, MDMA is administered to facilitate emotional openness and allow patients to confront traumatic memories and identify triggers. Researchers suggest that the associated increase in serotonin may allow individuals to engage with traumatic memories with reduced emotional distress and self-judgment. This reduction in emotional overwhelm may facilitate greater insight into the origins of maladaptive thought patterns and help overcome psychological barriers that often hinder therapeutic progress.

In addition, a study of MDMA-assisted therapy for PTSD found that reductions in functional connectivity between the amygdala and posterior cingulate cortex (PCC) were associated with therapeutic improvement in PTSD symptoms.

Evidence suggests that strong functional connectivity between the amygdala and PCC may reflect heightened emotional monitoring and repetitive self-focused cognition, processes that resemble rumination. The amygdala plays a central role in threat detection and fear processing, while the PCC is a key component of the default mode network (DMN), which is involved in self-referential thinking, autobiographical memory, and future-oriented cognition. Increased connectivity between these regions may contribute to persistent emotional self-focus and negative thought loops characteristic of rumination (Singleton et al., 2023).

4. Possible Mechanisms

One mechanism that supports MDMA-assisted therapy as a potential treatment for rumination is its effect on brain connectivity. Rumination has been associated with activity in the posterior cingulate cortex (PCC), a brain region involved in self-referential thought processes. The amygdala plays a central role in the regulation of fear, anxiety, and stress responses (Gupta et al., 2011). Increased functional connectivity between these two regions may contribute to elevated levels of rumination. If MDMA-assisted therapy is associated with reduced amygdala–PCC connectivity in PTSD studies, and this reduction correlates with symptom improvement, then it is plausible that disrupting this connectivity may reduce maladaptive repetitive thought patterns.

Evidence suggests that strong functional connectivity between the amygdala and PCC may reflect heightened emotional monitoring and repetitive self-focused cognition. The amygdala serves as a primary center for threat detection and fear processing, while the PCC is a major component of the default mode network (DMN). The DMN is involved in self-focused cognitive processes, including reflection on personal experiences, recollection of past events, and consideration of future possibilities. Increased connectivity between these regions may contribute to persistent emotional self-focus and negative thought loops characteristic of rumination (Singleton et al., 2023).

A 2022 study examining MDMA-assisted therapy for anxiety associated with life-threatening illnesses provides qualitative evidence supporting this proposed mechanism. One participant described a substantial reduction in anxious thoughts related to cancer recurrence following treatment. Prior to therapy, she reported persistent concerns regarding everyday behaviors that she believed could increase her risk of cancer progression. Following treatment, she reported that these thoughts had largely subsided and that she had developed a greater sense of acceptance regarding her condition. Although this account does not directly demonstrate changes in neural connectivity, it suggests that MDMA-assisted therapy may reduce persistent anxiety-related thought patterns (Barone et al., 2022). These findings support the possibility that MDMA-assisted therapy may reduce repetitive anxious thinking and therefore warrant further investigation as a treatment for rumination.

Because MDMA produces feelings of emotional connectedness and psychotherapy often relies on the processing of distressing memories, it is possible that MDMA may also reduce rumination through altered memory reconsolidation or by facilitating fear-extinction learning and retention (Fedducia & Mithoefer, 2018). Under the influence of MDMA, patients may be better able to process emotionally significant memories with reduced fear responses. This pharmacological effect may promote reflective thinking and allow individuals to adopt a more accepting and less judgmental perspective toward their thoughts and experiences.

A 2022 study investigating MDMA-assisted therapy for patients with terminal illnesses provides additional support for this possibility. Participants reported profound psychological shifts during treatment. For example, one participant described experiencing a complete absence of fear and an enhanced ability to explore personal experiences without judgment. The

participant further reported that MDMA-assisted therapy enabled greater awareness of long-standing emotional isolation and difficulties related to emotional expression. These findings suggest that MDMA may facilitate deeper emotional processing and self-understanding, both of which may contribute to reductions in rumination.

5. Conclusion

MDMA-assisted therapy demonstrates considerable potential as a novel treatment for rumination by targeting both the neurobiological and psychological mechanisms that sustain repetitive negative thought patterns. Evidence suggests that MDMA may reduce hyperactivity within the amygdala and weaken its functional connectivity with the posterior cingulate cortex, a key region involved in self-referential thinking within the default mode network. Because rumination is closely associated with excessive emotional reactivity and persistent self-focused cognition, disruption of this neural circuitry may help individuals reduce repetitive negative thought processes. Furthermore, MDMA's ability to increase serotonin activity and promote feelings of emotional openness, safety, and interpersonal connectedness may enhance the therapeutic process, allowing patients to engage with distressing thoughts and memories with reduced fear and self-judgment. Findings from PTSD and related research further support the possibility that these combined effects may produce meaningful and lasting psychological improvements.

Despite these promising findings, several important limitations must be acknowledged. Research specifically examining MDMA-assisted therapy for rumination remains limited, and questions regarding long-term safety, individual differences in treatment response, and potential adverse effects remain unresolved. However, current evidence suggests that when MDMA-assisted therapy is administered in carefully controlled clinical settings with appropriate screening procedures and professional support, adverse outcomes are relatively uncommon and manageable.

Overall, MDMA-assisted therapy remains an emerging therapeutic approach; however, its ability to target underlying mechanisms associated with rumination highlights its potential as a valuable addition to existing mental health interventions. Continued clinical research is necessary to evaluate its effectiveness, establish long-term safety, and determine its broader applicability as a treatment for rumination and related psychological conditions.

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The Formality of Referents in New Jersey Gubernatorial Debates Between 1981 and 2025

Tyler Rotella

Abstract: This study examines the interpersonal formality of referents, the statements candidates use to address their opponents, such as “Mr. McGreevey” or “Senator Corzine,” in New Jersey Gubernatorial Debates over a 44-year time frame from 1981-2025. Following the methodological framework developed by Scott et al. (2021), 1,000 coding units across 21 debates were coded on a 1-7 valence scale in a content analysis, categorizing each unit into one of three categories: formal, informal, and disrespectful. Although no significant change in formality was observed over time, incumbency was found to be the primary indicator of formality across debates. This study proposes the “Open-Seat Effect,” finding that debates without an incumbent were significantly more informal than those with one present. The results of this study challenge prior research that attributes increased informality to cultural shifts, suggesting instead that the structural campaign conditions dictate informality, providing a foundation for future analysis of political discourse at the state level.

Keywords: Political Discourse, Elections, Debates, New Jersey, Informality, Incivility

1. Literature Review

The consensus of the American people is that American politics has become disrespectful. When asked to describe the tone and nature of politics, an overwhelming 84% said that it has become less respectful (Pew Research, 2023). This disrespect can be described by incivility, which Frimer et al. (2022) “define as impolite language that observers typically find to be rude and/or disrespectful”. Incivility has been portrayed as an overwhelmingly negative aspect of modern political discourse.

A content analysis by Scott et al. (2021) of all televised presidential debates explored the honorifics used by presidential candidates against their opponents. They found that over time, the honorifics used have become less respectful, which they claim indicates an overall increase in incivility due to the degradation of politicians’ rhetoric. However, other studies have indicated that incivility affects political communication in cycles, with periods of respectful politics and others with disrespectful politics (Goovaerts & Turkenburg, 2023; Shea & Sproveri, 2012). Although the consensus is inconclusive on whether incivility has progressively increased over time, most do agree that the current political climate is significantly more uncivil than the average. This recent rise in incivility makes it important to understand its potential societal consequences.

Debates offer the public the opportunity to watch the major candidates discuss policy issues. It is the only opportunity to see both candidates discuss the same issues at the same time and offer an extended time to hear them speak, commonly 60-90 minutes (Benoit et al. 2007). On average, roughly 25% of debates are spent discussing character rather than issues, allowing for confrontations between candidates on more personal subjects (Benoit et al. 2003). These character-level exchanges are often where “incivility spirals” form. An incivility spiral suggests that one uncivil action from one party can result in a defensive response from the other, which can potentially result in a physical altercation if not prevented (Andersson & Pearson, 1999). The implications of an incivility spiral during a debate mean that a single uncivil statement made by a politician could result in a degradation of the debate into disrespectful arguing about personality rather than respectful argumentation on issues. It is important to consider the characteristics of politicians to judge their inclination to use uncivil rhetoric. Men are significantly more likely than women to respond to incivility with further incivility, potentially fueling the flames of the incivility spiral (Cortina et al. 2017). In 2023, only 24% of governors, 25% of senators, and 32.7% of state legislators were women, meaning the more combative men form a supermajority of candidates in debates (Schaeffer, 2023).

1.1 Effects on the Population

Rises in incivility have resulted in a decrease in faith in political institutions, which is directly correlated with an increase in legal permissiveness (Marien & Hooghe, 2011). The probability of accepting illegal activities is 43% among highly distrusting citizens, while only 18% among highly trusting citizens. A government requires the trust of its people to properly function, and without that trust, the people are more likely to look the other way when people break the law. Highly distrusting citizens are not a fringe group, with incivility by prominent politicians being found to decrease the public’s trust in not just them, but the political system as a whole (Mölders & Quaquebeke, 2017). In a study conducted with 6,055 Danish citizens in 18,805 interviews over 18 months, Bøggild and Jensen (2024) found that incivility has no positive benefits for the political system and only contributes to people losing faith in the basic function of democracy. These findings are likewise corroborated by Van’t Riet & Van Stekelenburg (2022), who found that an increase in incivility decreases political trust without a positive effect on political participation. These findings regarding incivility also indicated the public’s awareness of such rhetorical tactics, with the citizenry being capable of distinguishing between civil disagreements and outright uncivil fighting. Likewise, the public is able to identify when exchanges involve issue-based negativity or personal negativity (Brooks & Geer, 2007). The rise in incivility and fall in political trust for politicians and institutions has resulted in a public that is theorized to be composed of “critical citizens” whose increased scrutiny of the government forces officials to act properly (Marien & Hooghe, 2011). However, the critical citizen was found to be “quite tolerant with regard to fiscal fraud or false social security claims”, meaning that any benefits from a more critical citizenry would result in greater legal

permissiveness. Despite the negative implications of incivility on the broader political landscape, politicians continue to use it due to perceived electoral benefits.

Politicians like Donald Trump commonly invoke uncivil language within their rhetoric, making them appear relatable to the average voter who has grown bored with the vague language used by mainstream politicians (Lammers & Baldwin, 2020). Uncivil political discourse, such as that seen in public affairs talk shows, is scored by viewers as more entertaining compared to more civil alternatives (Mutz & Reeves, 2005). Argumentative people are more likely to find uncivil political exchanges as entertaining, which is linked to an increase in political trust in this group. These findings indicate that the personality of viewers affects their reaction to incivility. Additionally, Brooks & Geer (2007) found that uncivil negative trait-based messaging by politicians resulted in the greatest increase in political interest, suggesting that incivility has modest positive effects on the engagement of the electorate, potentially increasing turnout at elections.

Politicians might additionally prefer incivility because it fosters greater partisan polarization, with citizens feeling angrier toward the “other side” (Gervais, 2019). By demonizing their opponents, they create an environment where their supporters feel no other choice but to support them. By creating a more energized and combative public, it is theorized that incivility can boost voter turnout. Yet it could equally result in less voter turnout because incivility depresses interest in what politicians have to say, and potentially politics as a whole, allowing it to be used by unpopular incumbents to minimize voter turnout (Feinberg & Frimer 2023). If incivility increases or decreases voter turnout in elections, it nonetheless proves to be a powerful tool for politicians seeking to influence voter demographics in their favor.

A common sentiment regarding incivility is that it is entertaining and, as such, increases the public’s attention to political issues. However, the moral disapproval of the statements made by politicians has been found to outweigh any potential gains made by the increased attention (Feinberg & Frimer, 2023). Any positive effects on the political environment are nullified due to the public’s disdain for norm-violating behavior. The public prefers politicians to be respectful, and as such, does not tend to reward negative behavior with increased support. Despite this, Mutz (2007) found that they are still entertained by uncivil debates more than civil ones and are more likely to recall statements made by an uncivil politician than a civil one. Incivility is a complex, subjective issue, one that can cause both positive and negative effects for democracy.

1.2 Study Justification

The purpose of this study is not to answer the question of whether incivility is harmful to American politics, but rather to investigate whether the trends of rising incivility in presidential debates are applicable at the state level, which currently lacks research. In their Functional Analysis of Senate and Gubernatorial debates, Benoit et al. (2007) noted that the types of statements made by candidates mirrored those at the presidential level, with acclaims being the most popular form of statement, followed by attacks and then defenses. The potential for

state-level trends to mirror that of the presidential level raises three hypotheses based on those formulated by Scott et al. (2021) in their presidential study:

Hypothesis I: The percentage of formal statements will decrease over time.

Hypothesis II: The percentage of informal statements will increase over time.

Hypothesis III: The percentage of disrespectful statements will increase over time.

The three hypotheses work under the interpretation that civil political discourse has declined over time, with increased informality creating an environment where disrespectful statements will become commonplace.

In his analysis of federalism, Young (2015) chose to focus on New Jersey since “longstanding tradition describes the Garden State as generic.” As such, a study seeking to replicate the presidential content analysis of Scott et al. at the state level would attempt to focus on a generic state, such as New Jersey.

In a study of the civility of state legislatures through surveys of lobbyists in each state, Kettler et al. (2022) found that states with citizen legislatures that are democratically controlled and have growing economies have higher perceptions of civility. The focus of this study, New Jersey, falls under several of these categories, strengthening the argument that the results of this study could be more civil than the often negatively perceived presidential debates.

For all the reasons previously mentioned, a study that explores the change in formality over time in New Jersey Gubernatorial Debates could prove valuable in determining the relationship between the state and presidential levels of political communication. As such, the guiding question for this study is: “How has incivility in New Jersey Gubernatorial Debates changed over time through the usage of honorifics and referents from 1981 to 2025?”

2. Method

This study aims to serve as a pilot study following the framework developed by Scott et al. (2021) in the context of New Jersey Gubernatorial Debates. It includes all publicly available debates from each election cycle between 1981 and 2025 using publicly available recordings from the C-Span archives and YouTube. Debates were the best means of collecting data as they provide “an extended opportunity to learn about the candidates, particularly compared with television spots” (Benoit et al. 2007). This study utilized one coder throughout the data collection process. A sample size of 1000 coding units across 12 campaign cycles and 21 debates was collected. To ensure the validity of the coding process, two independent coders evaluated 50 coding units, 5% of the overall sample size. The inter-coder reliability was accessed using Cohen’s Kappa, resulting in a coefficient of $\kappa = 0.632$, indicating substantial agreement.

Additionally, both coders recorded substantial agreement with the master key ($\kappa C1 = 0.7689$; $\kappa C2 = 0.7069$).

2.1 Coding Explanation and Justification

For this study, an interpersonal referent is the manner in which an addresser refers to the addressee(s), signalling disrespect, neutrality, or respect through the varying terms used. A coding unit is designated as the terms used to describe the addressee, such as “Jim McGreevey” or “Governor Kean.” A coding unit does not include tone, overall statement, or body language, and only analyzes the words used directly. The degree to which the interpersonal referents demonstrate respect is placed on a scale from 1 to 7 as adopted by the study by Scott et al. (2021). Table 1 shows the different valence levels of address terms, edited to provide examples relevant to New Jersey rather than presidential debates. Referents with a valence of 1 or 2 show meaningful disrespect for the addressee, compared to terms with a valence of 3, 4, or 5, demonstrating varying levels of informality, with some purposeful and accidental disrespect due to the absence of the highest honorific titles. A respectful address term that is appropriate for a political setting earns a valence level of 6 or 7.

When reviewing a debate, the moment a candidate directly refers to their opponent, the year, the speaker, the target, the statement, and the timestamp is written down. Depending on the level of respect in the statement, the unit is graded with a valence level designated by Table 1. For example, in 1997, Murray Sabrin referred to Christine Whitman as “Borrow and Spend Christie Whitman,” which was then coded as a valence of 1 because it described Governor Whitman using the pejorative adjectives of borrow and spend. These adjectives have a negative connotation in political settings and were intended as an insult to her governing style.

Table 1. Coding Scheme for content analysis of address terms in gubernatorial debates.

Interpersonal Referent	Debate Examples	Coding/Valence (1-7)
Pejorative Adjective	"He is a coward" "Tax and Spend Jim McGreevey"	1
Purposeful distortion or mocking of candidate name	"Murphy's Law" "Corzine-Buono years"	2
Partial Name (Only first or last name used)	"Jim" "The Corzines"	3
Full Name of Generic Individual Reference (No title or rank used)	"Chris Christie" "This governor" "My opponent"	4
Absent Highest Professional/Political Rank/Title	"Mr. Schundler" "Mayor McGreevey" instead of "Senator McGreevey"	5
Use of "Proper" Professional Title	"Governor Murphy" "The assemblyman"	6
Double Honorific; Highly formal	"Mr. Governor" "Mrs. Congresswomen"	7

Since not all candidates make the same number of referents or appear in the same number of debates, all coding units were averaged per politician and campaign year to find the average number of referents. This allows, as a hypothetical example, a debate in 1985 that has far fewer units compared to 2017 to become comparable and applicable for greater analysis.

Darr (2011) suggested that the formality of referral statements “create an environment conducive to civility and to the passage of quality legislation.” This study, therefore, focuses on referral statements because they provide a consistent, objective indicator of baseline civility in political debate.

2.2 Study Limitations

The scope of this study is limited to the referents candidates use in reference to their opponents, and as such, the overall substance of their rhetoric is outside of the scope of this study. If candidates are formally respectful in their referents, and not in their substance, this study would label such debates as formal and not uncivil. Despite this limitation, the results of this can help develop a greater understanding of the mechanics state-level politicians use, such as the use of formal referents to promote social distance.

3. Results

The hypothesis of this study predicted a decrease in the overall formality of gubernatorial debates, yet there is no significant trend indicating that the percentage of formal referents has changed in the 44-year time frame between 1981 and 2025 ($p = 0.799$; two-tailed; $\alpha = 0.05$). This data is illustrated in Chart 1. The lack of a trendline can be explained by the volatility of the formality variable, with years with incumbents being relatively high (48.19% of referents were formal in years with an incumbent), but for years with an open seat, formality was relatively low (only 13.17% of referents were formal in years without an incumbent). When considering incumbency rather than the debate year, there is a clear difference; debates where an incumbent is participating have more formal referents ($p = 0.011$; two-tailed; $\alpha = 0.05$).

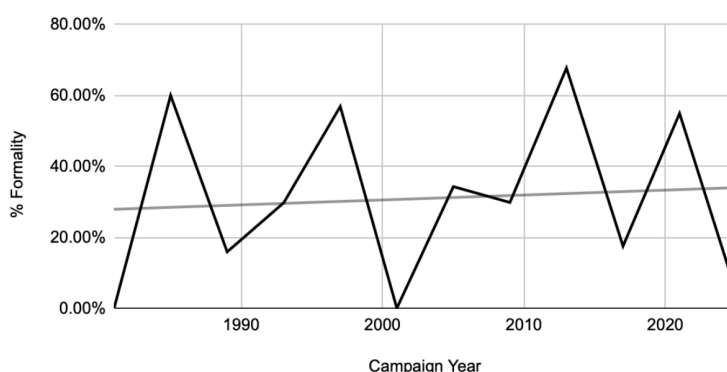


Chart 1:
The Change in the Percentage of Formal Referents over Time

The second hypothesis proposed that the inverse relationship between formality and informality would result in an overall increase in informal referents; however, this too was shown to have no significant trend ($p = 0.693$; two-tailed; $\alpha = 0.05$). This data can be seen in Chart 2. When accounting for incumbency instead of year for informal referents, there is, similarly to formal referents, a significant difference ($p = 0.016$; two-tailed; $\alpha = 0.05$). In debates with an incumbent, 50.72% of referents were informal compared to debates with an open seat, where 83.93% of referents were informal.

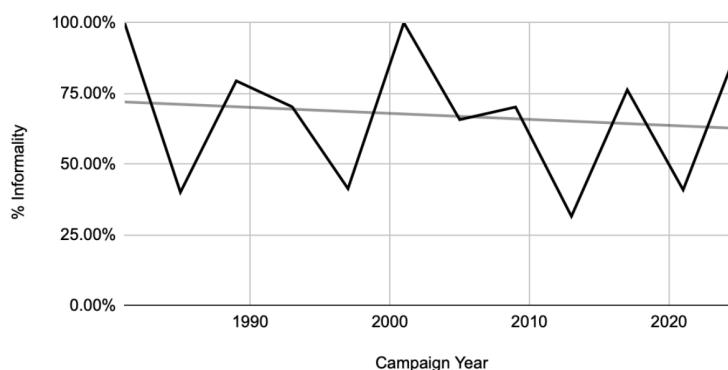


Chart 2:
The Change in the Percentage of Informal Referents over Time

The third hypothesis posited that, due to the conventional wisdom in political analysis stating that politics has become less civil, the percentage of disrespectful referents would increase over time. Although the trend is somewhat stronger than in the other two variables, it too was found to be insignificant ($p = 0.122$; two-tailed; $\alpha = 0.05$). Chart 3 visualizes the change in disrespect over time, with an R^2 of 0.22, suggesting that 22% of the variance in disrespect can be explained by the passage of time. When considering incumbency rather than the year, there is no significant difference, with similar percentages of disrespectful referents in both

debate environments (1.09% of referents were disrespectful with an incumbent while 2.90% of referents were disrespectful with an open seat), indicating that other factors, such as the individual personalities of politicians, may account for the remaining variance ($p = 0.351$; two-tailed; $\alpha = 0.05$).

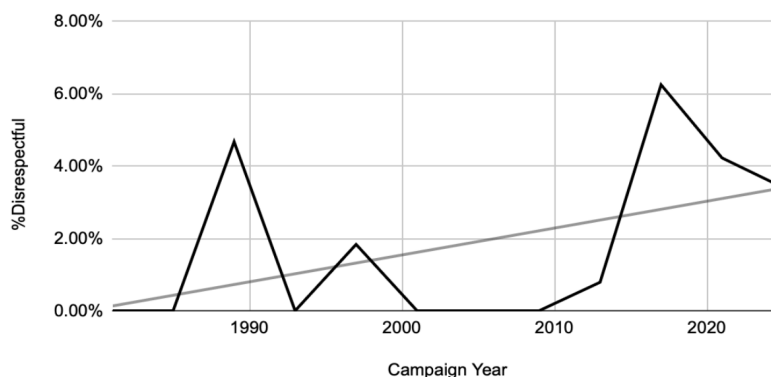


Chart 3:
The Change in the Percentage of Disrespectful Referents over Time

Table 2 compiles the five candidates with the highest average valence levels, indicating the highest levels of formality out of all candidates. The inverse is shown in Table 3, which shows the five candidates with the lowest average valence levels, indicating the highest levels of informality amongst candidates. What is important to note is that a candidate with a low valence level is not necessarily uncivil, but simply does not demonstrate the expected level of respect for their opponents in a political debate setting.

Candidate	Campaign(s)	References	Average Valence
Peter Shapiro	1985	16	5.5
Chris Christie	2009 and 2013	98	5.3877
Doug Forrester	2005	44	5.25
Barbara Buono	2013	93	5.1827
Christine Whitman	1993 and 1997	71	5.1408

Table 2:
The Five Candidates with the Highest Average Valence Level

Candidate	Campaign(s)	References	Average Valence
Thomas Kean	1981, 1985	36	3.1944
Mikie Sherrill	2025	58	3.4827
Bret Schundler	2001	13	3.6923
Kim Guadagno	2017	61	3.754
Jim Courter	1989	62	3.9677

Table 3:
The Five Candidates with the Lowest Average Valence Level

Although the passage of time was not a significant predictor of the formality of gubernatorial debates, the presence of an incumbent in the debate environment results in an increase in formal referents. The inverse of this is demonstrated in Chart 4, which illustrates the difference in the percentage of informal referents between incumbent and open-seat debates. This suggests that incumbent participation stabilizes the debate conversation more than the given era in which the debate takes place.

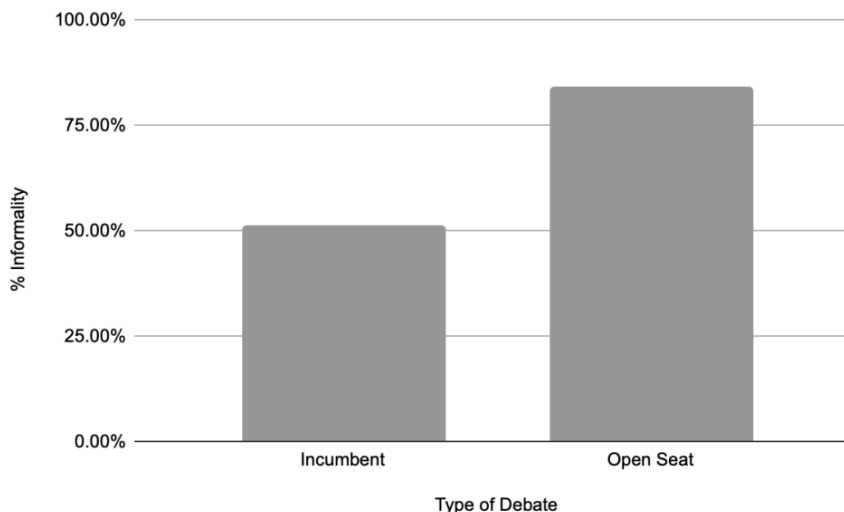


Chart 4:
The Percentage of Informal Referents Dependent on Type of Debate

4. Discussion

The passage of time is an unreliable indicator of the apparent formality of given gubernatorial debates. As seen in Charts 1, 2, and 3, there are no statistically significant trends related to time. This is due to periodic shifts, with specific cycles having high levels of formality, while others are marked by high levels of disrespect. This cyclical pattern could be attributed to the presence of the incumbent, the residing governor. The governor brings credibility to debates; holding the most powerful office in the state demands respect. Despite challengers making significantly more attacks than the incumbent (Benoit et al. 2007), they still have to acknowledge that their opponent is the governor, leading to their referents being more formal even if their substance is not. Senator Barbara Buono, in the 2013 debates, is a clear example of this trend, being extremely combative towards Governor Christie throughout the two debates, yet still referring to him as the governor the entire time. Darr (2011) suggests that this could be attributed to a respect for the office itself, as referring to Christie in any other manner would be disrespectful to the position of governor. Challengers respect the office and refer to the governor as such to demonstrate this.

Open-seat debates demonstrate a different trend than those with an incumbent governor. While debates with incumbents had a relatively even percentage of formal and informal referents, open-seat debates were overwhelmingly informal, with 83.93% of referents being coded as informal, as seen in Chart 4. One potential explanation for this overwhelming preference for informal referents could be that the title of governor acts as insulation for a candidate from personal referents, so when no incumbent is participating in the debate, the

referents become more targeted toward the candidate's character. The atmosphere of an open-seat debate is noticeably more combative, with most of the disrespectful referents coded being seen in open-seat cycles. This might be due to both candidates lacking the authority of the office, resulting in them attempting to discredit their opponent more to prevent them from gaining momentum.

4.1 Coding Unit Exploration

Until 2007, when Governor Corzine banned the practice, elected officials in New Jersey could hold multiple elected offices at once. Jim McGreevey was one of these politicians, being both the Mayor of Woodbridge and a state senator during the 1997 campaign cycle. In a particular exchange between him and incumbent governor Christine Whitman, she referred to him as "Mayor McGreevey," which in the context of the study was coded as a 5 rather than a 6 on the valence scale. This was due to Governor Whitman omitting his highest political title of senator for the lower title of mayor. This was a rhetorical attempt to discredit Mr. McGreevey as a candidate for governor, making audiences not see him as a state senator with years of experience in Trenton, but as a local mayor who does not have the ability to handle the pressures of the governorship. This particular exchange is indicative of the complexities of political campaigns, where the rhetorical strategies candidates use have purposeful meaning to make themselves appear more electable than their counterparts.

Referents on the borderline of valence levels require deep analysis, resulting in greater time spent on these borderline references. A coding unit coded as a 4 must either include the candidate's full name or a generic reference to an individual, which can result in statements that appear to be either more or less formal to be categorized at this level. One such instance of this occurrence was with the common referent of "this governor." It was originally coded as a 6 due to the presence of the professional title, but was later recorded as a 4 due to the vague reference to the individual; "this" could apply to anyone with the title of governor and, as such, was viewed as generic.

4.2 Comparison to the Presidential Level

The tactics candidates use in state-level contests were found to mirror those of the presidential level by Benoit et al. (2007), and the results of this study find a similar connection. The Scott et al. (2021) content analysis that this study replicates found an average valence level of 4.925 for all general debates, while the average valence level for the gubernatorial debates was 4.624, which indicates a similar trend between the two. This study reaffirms the conclusion made by Benoit et al. (2007): state political discourse mirrors the trends of presidential debates. However, the presidential study found an overall increase in informality over time, suggesting that debates have become less formal and more disrespectful. This study does not find the same result, yet it can be explained by the lack of inclusion of primary debate data in this study. Primary debates were found to be significantly less formal than general elections, so due to the

overall increase in primary debates in recent years, in combination with the presidential study having an overall larger data sample (1948-2020), it is reasonable to assume that the addition of these two factors not present in this study explains the difference in results.

When only accounting for the 1980s onwards, the trends between the gubernatorial and presidential debates mirror each other. The general range of formality in the presidential debates stays within 30-50%, while in the gubernatorial debates, that range was 0-60%. The presidential range is more precise due to the greater quantity of debates analyzed in that study, compared to the 1-2 gubernatorial debates viewed per cycle. Formality was often the less common characteristic of coding units in both studies. Although the percentage of formal referents varied by campaign cycle, it consistently remained less common than informal statements.

Between 1960 and 2020, 8 presidential debates had an incumbent present, while 5 were open seats, meaning 38.4% of presidential debates during this period were open-seat campaigns. Comparatively, between 1981 and 2025, 6 gubernatorial debates had an incumbent present while 6 were open seats, meaning 50% of gubernatorial debates during this period were open-seat campaigns. Since open-seat debates were found to be significantly more informal than ones where there was an incumbent, this explains why this study had an overall lower average valence score than the presidential study. This means this study contained a balanced sample size not biased toward either form of debate, making the results potentially more applicable.

5. Conclusion

The 12 New Jersey Gubernatorial debates between 1981 and 2025 have demonstrated no significant change in the formality of referents over time. State-level political discourse has not seen a meaningful change in how politicians refer to each other in debates. The major indicator of whether a debate will be formal is the presence of an incumbent. This study suggests that the presence of an incumbent results in all candidates in a debate demonstrating a higher overall level of formality than if the incumbent were not present.

The existing literature does not acknowledge the importance of incumbency on the level of formality in debates, and as such, this study proposes the existence of an “Open-Seat Effect.” This effect suggests that in campaigns where there is no incumbent running, the candidates for the office will be significantly less formal in the language they use to refer to their opponents. For candidates running, understanding this trend could be important to avoid portraying themselves in a way the public morally disapproves of (Feinberg and Frimer, 2023). The existence of the Open-Seat Effect provides a new interpretation of informal political discourse in debates, that rather than passage of time being the indicator of informality, the conditions of the campaign itself dictate the formality. Previous research that found rising informality over time may have unknowingly measured open-seat frequency rather than meaningful shifts in political norms. This means that the existing literature has potentially misattributed core characteristics of debate functions to cultural changes. The consequences of the Open-Seat Effect will change how

researchers design studies, how they account for variables, and how policymakers interpret claims about civil decline.

This study presents robust findings not present in the existing literature, defining the formality of state-level political discourse, allowing for future exploration of the subject to have a baseline understanding of the trends to expect. Incivility has been found to negatively affect institutional trust and interest in politics (Bøggild & Jensen, 2024; Feinberg & Frimer, 2023), but since there was no significant increase in disrespectful referents in the 44-year timeframe, the negative consequences of political communication pose no immediate threat to New Jersey political discourse.

Incivility is less of an existential threat at the state level, with the formality of debates being more related to incumbency than a shift in political communication. This study suggests that although state-level trends mirror those of the presidential level, they are more dependent on the particular circumstances of the debate rather than the era in which they take place.

6. Further Directions

This study was limited by its scope, focusing only on the referents and honorifics used by candidates in reference to their opponents, omitting the tone, body language, and substance of statements made by candidates. These variables could all potentially have meaningful impacts on the overall civility of a debate, yet went unaddressed in this study. A more comprehensive study of the civility in gubernatorial debates could definitively reveal whether the era in which a debate takes place has an effect on the level of civility.

Additionally, a study that analyzed the primary debates for governor could reveal potentially unique trends not seen in the general debates. Due to the ideological relatability of candidates in primary debates, it could be assumed that they will be more friendly and respectful towards each other. Presidential trends indicate that these types of debates will be more informal, but a study that analyzes whether primary gubernatorial debates share a similar characteristic could be important to the overall literature.

To create a more nuanced understanding of whether the trends of informality at the state level mirror those of the federal level, a study that analyzes the referents between gubernatorial candidates in a greater number of states should be conducted. Taking states that, such as California or Wyoming, have voted with extreme partisanship at the national level for decades could reveal whether a minority party's chances of winning result in increased informality. New Jersey has seen extremely competitive gubernatorial debates during the past 12 cycles, which means that competitiveness could have influenced candidates to change their formality to gain traction with voters. By studying more states, some with competitive and some with non-competitive gubernatorial campaigns, it could reveal whether the chances of a candidate winning influence their formality.

Further study into the Open-Seat Effect could prove valuable in developing the body of literature on incivility. A study that was to explore the different levels of formality in incumbent

and open-seat debates across a larger sample size of states could help validate the effect's validity. A potential exploration of House of Representatives, Gubernatorial, Senate, and Presidential debates could provide greater insight into whether the effect applies to the different levels of political office, or if it is a trend exclusive to gubernatorial debates.

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A Table for One or Many: Social Connection and Psychological Restoration in Amman, Jordan, Third Places

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Abstract: This study aims to understand cafes as third places in Amman, Jordan, and their psychological effect on patrons. Through its examination of cafe patron comfort, relaxation, and social connection, and their perception of the environment around them, this research connects psychology, sociology, and environmental psychology. This work studies the cultural values of community and belonging as a mechanism for amplifying the effect of cafes on well-being. By doing so, this research addresses a regional and contextual gap in the literature that is formed by the limited works studying cafes and third places in eastern contexts. As well as the scarce studies exploring the role of culture in enhancing the psychological benefits of third places. This study's foundation is built on theoretical works supporting the understanding of the importance of third places, such as Third Place Theory, Attention Restoration Theory, and the Stress Buffering Hypothesis. A mixed-methods approach was used in data collection to ensure a holistic understanding of the topic and achieve the study's objective. A survey was used to measure participants' emotional experiences and perceptions of cafe environments, addressing both the physical and social factors. Structured cafe observations were conducted to document an objective understanding of each cafe's social dynamics and physical environment. Combining both data points allowed for deducing patterns between patrons' perceptions, self-reported well-being, and the physical attributes of cafes. The findings suggest that cafes function as third places in Jordan. Overall, this work highlights the importance of informal social environments as third places in shaping the everyday psychological experiences of their patrons. Moreover, it addresses a gap in understanding how culture may affect the psychological benefits of well-established psychological theories and understandings. The findings also provide insight for urban planners by contributing to the understanding of how physical features of communal spaces affect their users.

Keywords: Third places, Attention restoration theory, Stress reduction theory, Weak ties

1. Background and Context

Urban life is often thought to be defined by formal institutions and design plans. However, the informal aspects of urban life are the most important. Places like cafes, malls, and parks that individuals actively seek out in their free time. The environments where they form memories, connections, and social activity. The most prominent of these environments in Jordan is cafes. Cafes have emerged as prominent social settings across many different societies. While they may be thought of as simply food and beverage consumption settings, similar to restaurants, cafes play a vital role in Jordanian society that is distinct from the beverages consumed within cafe settings. Cafes function as third places where individuals study, work, socialize, or spend time in the presence of others, fulfilling their need for social connection and reducing loneliness. Accordingly, cafes have developed a role beyond that of a commercial space. The theoretical framework explaining why cafe environments influence the psychological well-being of their users is thorough and is based primarily on four perspectives. Ray Oldenburg's Third Place Theory (1999) describes the informal spaces that exist outside of the home and the workplace. Oldenburg explained that third places provide opportunities for social interaction and community connection, and therefore are beneficial to their users. The Attention Restoration Theory (1995) explained that certain environments reduce cognitive fatigue and restore mental focus. Similarly, the Stress Buffering Hypothesis (1985) proposed that social environments reduce the psychological effects of stress. Additionally, Granovetter's theory of weak ties (1973) highlights the importance of casual social interactions that may occur in public gathering spaces. Combined, these works highlight the importance of spaces similar to cafes in promoting well-being and positive psychological experiences.

2. Literature Review

2.1 *Social Ties, Social Capital, and Community*

Understanding the connection between mental well-being and third places begins with exploring the existing scholarly work. Prior research surrounding this topic spans across many disciplines, including sociology, psychology, and environmental studies. A prominent focus within this literature is on social connection, informal interactions, and community structure. Within sociology, Granovetter's theory of weak ties stands out as foundational work (Granovetter, 1973). In his theory, Granovetter explained that weak ties (acquaintances) provide a vital social purpose distinct from that of strong ties (close friends or family).

Similarly, Putnam's work defined social capital as referring to networks, norms, and trust that facilitate coordination and cooperation for mutual benefit (Putnam, R. D., 2000). His work reframes social capital into a measurable phenomenon, which can be empirically tested. The work focused on what Putnam calls the "collapse of the American community". Putnam discussed that the erosion of social connections weakens democracy, social well-being, and

civic life. While earlier research documented the decline of traditional community structures, more recent works have examined how social connections are formed in contemporary conditions. In Hampton & Wellman's work (2003), the idea of networked individualism within a modern society is extensively explored (Hampton & Wellman, 2003). Networked individualism refers to a pattern of social organization characterized by flexible and personalized ties distributed across multiple social contexts rather than fixed membership in one local community. Hampton & Wellman's work complements Putnam's, exploring how society adapted to his observation of "bowling alone" by creating new patterns in a modern, internet-facing society (Putnam, 2000). Hampton & Wellman emphasized the change in social patterns that happened after the phenomenon of declining civic engagement that Putnam witnessed. In the frame of Hampton & Wellman's work on the restructured social landscape, community is no longer sustained through fixed membership in a place-bound group; it is maintained through repeated, informal interaction within the everyday context across multiple groups.

2.2 Social Support and Stress Buffering

Building on sociological accounts of social connection, psychological research explores the mechanisms through which social connection affects well-being, most notably in the work of Sheldon Cohen and Thomas A. Wills (Cohen & Wills, 1984). In Cohen and Wills' work, two concepts were established: First, the Main Effect Model, which covers the importance of social support for all people regardless of mental state. Cohen and Wills' first model explained that people who feel socially connected maintain better physical and mental health and have a better overall mood.

Further, it is important to note that Cohen and Wills provided specific definitions for social connection and support within their work. They identified four forms of social support:

1. Emotional support, the feeling of being cared for, valued, or understood
2. Informational support, receiving guidance or support.
3. Instrumental support, practical help.
4. Appraisal support, which refers to feedback that helps one interpret a situation.

However, Cohen and Wills stressed that perceived support matters more than actual support. And by extension, they emphasized that social connection is a psychological state, not a behavior. Their logic allows for the benefits of social connection and support to extend to individuals who receive no direct social support and only perceived support. The second model presented by Cohen & Wills is The Buffering hypothesis. The Buffering hypothesis is built on the Main Effect Model (MEM) in that it describes how the benefits of social support intensify

when stress is present. True to its name, the buffering hypothesis explained that social connection and support act as a buffer in high-stress situations. The hypothesis delineated that when stress is present, be it from work overload, family pressure, or emotional distress, perceived social support acts as a cushion that dilutes the effects of stress. While the stress remains present, its psychological impact is greatly softened. Cohen & Wills' work is especially important because it established that social support can be perceived rather than explicitly received, while still retaining measurable psychological benefits. Extending the theories of social support into real-world environments is the empirical work of Rosenbaum et al. (2007), which explored how commercial spaces may present as an application for the psychological theories surrounding social support (Rosenbaum et al, 2007). Their article "A Cup of Coffee with a Dash of Love: An Investigation of Commercial Social Support," examines how cafe environments can provide social support despite the absence of deep or meaningful interaction. Key findings of the study showed recurring patterns of emotional comfort. Participants often described cafes as safe, familiar, comforting, and emotionally regulating places. Participants openly stated that they would visit cafes when they feel stressed, lonely, emotionally overwhelmed, or in need of routine. A second key finding supported the previous belief that social support did not necessarily require intimate interaction. Many participants said that although they did not actively socialize, they felt recognized, valued, and less alone. They reported that the main reasons for these feelings included being in places that felt socially alive and being greeted by staff. Finally, the research established a third understanding that regularity was more important than intimacy. Social connection builds up through repeated visits, consistent environments, and predictable interaction rather than emotional disclosure or intimacy. This finding is consistent with the previously discussed theory of Weak Ties, by emphasizing that a place could remain relaxing and maintain all the benefits of social connection even in the absence of close ties. Rosenbaum et al.'s work serves as the empirical validation of the psychological theories surrounding social support, providing empirical evidence studying how these theories are valid not only in real-world situations but equally in commercial spaces that mainly offer weak ties. This connects many psychological and sociological theories to a tested, empirical work

2.3 Physical Environment and Psychological Restoration

To fully understand how cafes affect the emotional state of those within them, the body of literature examining how the physical environment can independently affect emotional well-being and influence psychological restoration and stress reduction is examined. Notably, Roger S. Ulrich's Stress Reduction Theory is a foundational pillar in understanding how physical environments affect stress and well-being (Ulrich, 1983). The Stress Reduction Theory mainly argued that humans have an effective and automatic response to physical environments. Further, Ulrich explained that certain environmental factors trigger rapid stress reduction, a response that is entirely psychological and emotional rather than cognitive. Ulrich characterizes stress reduction as lowered physiological arousal, improved mood, reduced

anxiety or tension, and faster emotional recovery after stress. He noted that the stress reduction referred to in his work is not one related to long-term therapy, identity, or big psychological change. Within his work, he emphasized which environments trigger rapid stress reduction; he described these environments as non-threatening, often natural, and visually coherent. He stated that these environments should feel safe, predictable, and aesthetically pleasing. Ulrich stressed that the stress reduction is subconscious and automatic, noting that one does not have to actively think an environment is relaxing to trigger the rapid stress reduction. Only a few years later, Ulrich worked on an experiment that provided the empirical proof to his theory through a controlled lab experiment whose findings supported Ulrich's original hypothesis (Ulrich et al., 1991). Ulrich's work is undoubtedly foundational in environmental psychology as it widens the understanding of what provokes stress depletion while still connecting to previous theories claiming that solitude and psychological rest are not mutually exclusive. Another framework that is foundational to the understanding of how environments affect mental well-being is Kaplan's Attention Restoration Theory (ART) (1995). Kaplan explained that natural and soft-fascinating environments promote restoring cognitive fatigue by engaging involuntary attention. Kaplan explained that the environment must meet certain requirements in order to allow for restoration. These requirements include: being away, compatibility, and fascination. Oftentimes, cafes fulfill all of these requirements.

2.4 Research Objective & Question

This study aims to explore cafes as third places in Jordan. Specifically, it aims to understand and investigate how spending time in cafés influences Jordanians' self-reported stress, mood, and social connection, and how the culturally rooted values of belonging and community amplify cafés' role in psychological wellbeing. This goal is guided by the following question: How does spending time in cafés influence Jordanians self-reported stress, mood, and social connection, and how might the culturally rooted values of belonging and community amplify cafés' role in psychological wellbeing?

2.5 Hypothesis

More frequent cafe visits are expected to correlate with positive immediate psychological changes. Such as lowered perceived stress, improved mood, and an increased sense of social connection. Additionally, cafes that provide adequate privacy, a suitable noise level, and elements of nature are predicted to elicit higher self-reported comfort among patrons. Further, it is assumed that patrons who report feeling a connection to the broader Jordanian community while at a cafe will report a greater positive psychological impact of a cafe visit than those who do not, suggesting that culturally rooted values of community may reinforce the psychological benefits of café experiences. Finally, it is expected that cafes will meet the psychological benefits of third places outlined in Oldenburg's theory of third places.

2.6 Gaps Recognized

While the scholarly body on third places and well-being is large and well-versed, it still leaves a large conceptual gap that this work addresses. Specifically, the conceptual gap is broadly divided into two parts:

1. Geographically, most social and environmental psychology research surrounding this topic is done in Western contexts. Research that tests these theories and concepts in an Eastern setting is highly limited.
2. Cultural framing: Within the research presented, cultural demands, expectations, and values are often placed in the background due to their insignificance in Western daily life. However, in contexts similar to that of Jordan's, culture is at the forefront of daily life and greatly contributes to the needs of the Jordanian people, such as the need for community and belonging.

3. Methodology

3.1 Ethical Considerations

Before data collection, multiple steps were taken in order to ensure the body of research was wholly ethical.

1. The researcher underwent OHRP research training and received certification as a researcher.
2. The researcher referred to the psychological experts during the process of methodology drafting and creation to ensure that all actions and practices adhered to the ethical standards involving humans in research.
3. All research practices, survey questions, interview scripts, and behaviors surrounding the body of work were overseen and approved by the Institutional Review Board (IRB) at the researcher's school.

During the data collection, ethical considerations were heavily involved. Consent was collected before the survey, both verbally when suggesting the survey be completed, and at the beginning of the survey, before any questions were presented or answered.

Participants were not asked to describe any personal experiences or provide any identifying data. Participants were also thoroughly briefed about the purpose of the study, as well as how their data would be used and handled. By completing the survey, participants provided informed consent for their anonymous responses to be used for research purposes.

3.2 Methodology Overview

This paper employs a cross-sectional, mixed-methods approach. This was done by combining field data, structured observations of the cafes, and the survey results, with expert interviews. This methodology was used to best encapsulate the nuanced topic at hand and ensure both scientific and theoretical alignment with the study's goals. Both parts of the field data worked together in order to document both the psychological experiences of cafe patrons and the environment in which these experiences occurred.

Two expert interviews were conducted, both with experts in psychology.

- a. Expert one: A BPS-chartered Clinical Psychologist who specializes in emotional regulation, community mental health, and psychological flexibility.

“In my clinical work, I specialize in psychological flexibility, emotional regulation, and evidence-based interventions that support individual and community mental health. Alongside therapy, a significant part of my academic focus involves understanding how environments and social structures influence psychological well-being. This includes population-level mental health promotion, mental health literacy, and community-based support. That creates accessible pathways to wellbeing outside formal clinical care. I'm particularly interested in how everyday public spaces can function as an informal mental health regulator.” (Expert 1, personal communication, 2026)

This expert's questions mainly focused on validating the theoretical framework and understanding the psychological function of communal spaces.

- b. Expert two: A general practitioner with clinical specialization in Cognitive Analytical Therapy (CAT), Cognitive Behavioral Therapy (CBT), and Dialectical Behavior Therapy (DBT).

This interview analyzed cafe experience in terms of emotional regulation as well as the specific mental health challenges of young adults and how culture affects them.

Both interviews were tailored to fit the expertise of each interviewee. Interview questions can be found in Appendix C.

Once the expert interviews were completed and the scientific basis of the study was established, the collection of the on-ground data began. The field data collection process was split into two sections: observation and questionnaire. This was done to achieve a holistic

understanding of cafes as third places in Jordan, and to ensure that environmental factors within specific cafes could be tied to the psychological effects they provided.

a. Cafe Selection and Typological Diversity:

The research conducted field work in five cafes, each representative of a different range of cafes, to ensure all differences among cafes are accounted for. The five cafes selected were as follows:

I. Al-Ameed Community Cafe: A large-scale community chain that provides both indoor and outdoor seating and is embedded in the neighbourhood it was named after, and was designed around communal gathering. Al-Ameed Community Cafe was the largest one observed, as well as the one with the most facilities. It includes two tennis courts, a playground, and a small walking trail that follows the natural layout of the cafe.

II. Fanak Specialty Coffee: Fanak was the smallest of the cafes observed. It is a small neighbourhood cafe with 2 consistent staff members, regular clientele, and overall has the most intimate environment.

III. Bon Appétit: A destination cafe in a high-traffic area with a diverse clientele. Bon Appétit is the only food-focused cafe observed.

IV. Melange Cafe: The only work /productivity-focused cafe of the five, with a professional atmosphere and the most functionally serious cafe.

V. Manara Cafe: Located in an arts and culture center, Manara is the second-largest cafe observed. Notably, Manara is the most cosmopolitan of the five cafes, with both local and foreign visitors.

b. The Observation:

Upon arrival at the cafe, the researcher completed an observation sheet assessing the physical environment and occupancy of the cafe. The observation sheet, found in Appendix B, sought to describe the physical factors that patrons would be questioned about during the questionnaire to aid with the analysis of the data and guide the linking process between physical environment and patrons' answers, both regarding self-reported psychological well-being and rating of privacy, seating arrangement, and noise level. In the observation sheet, noise level was measured through a dB meter app for a total of one minute. The mean noise level was then documented.

c. The Questionnaire:

The questionnaire consisted of 4 major themes, which are further discussed in the survey findings section. The questionnaire employed multiple question formats, including the Likert scale. The question formation process considered the psychological nature of the study by utilizing psychological question methods, such as the Positive and Negative Affect Schedule (PANAS). PANAS questions were merged with the Likert scale format. Questions were presented thematically to simplify the analysis process. The survey was created using the Google Forms software and was distributed in person via QR code. In order to ensure privacy and complete anonymity, no identifying data was collected, and participants were **not** asked to sign in using their emails. Participants were also asked to include the name of the cafe they were in to allow for cross-comparison with observation sheets.

4. Findings

4.1 Survey Findings

The questionnaire consisted of 20 questions, excluding demographics, divided into three major themes.

Figure 1

THEME	ASSESSING	QUESTION NUMBER
Cafe Usage Habits	- Usage Habits	1-3
Psychological Wellbeing and Emotional State	- Changes in mood during/after cafe visit - Positive/Negative emotions invoked by the visit	4-10 assessing mood and stress, 19-20 assessing overall psychological wellbeing
Environmental and Physical Features of the Café	- Privacy - Comfort - Noise level	16-18
Belonging and Social Connection	- Feelings of belonging/connection to the broader community during stay	11-14
Demographics	- Age - Gender - Current cafe	21-23

4.2 Cafe Usage Habits

Of the participants of the survey, most rated themselves as frequent cafe visitors. 8.1% said they always visit cafés, 36.5% said usually, 11.5% said sometimes, and only 3.8% said rarely. Placing 84.6% as frequent café-goers. This confirms the assumption that cafes are frequently used by Jordanians and are a part of everyday life. As for the reason for visitation, 53.8% of participants placed socialization as the reason for their visit, followed closely by working or studying at 44.2%. Notably, only 1.9% pointed to relaxation/personal escape as the primary reason for their visit. Therefore, cafes in Jordan's primary function is socializing, followed closely by productivity.

Supporting this understanding are the percentages shown below.

Figure 2

Companionship	Percentage
Visiting alone	23.1%
With a small group	42.3%
With one other person	34.6%

4.3 Demographics

The survey sample was representative of the people present in the cafes, meaning that it is skewed in both age and gender. In regard to age, 36.5% of respondents are aged 18 to 24, and 34.6% are between the ages of 25 and 34. With gender, 61.5% were female, leaving only 38.5% male participants. However, the male skew may be slightly more exaggerated than the actual percentage because men regularly refused to participate in the study.

Overall Findings by survey item:

A. Mean, Positive, Neutral, and Negative Percentages of survey items

Figure 3

Survey item	Mean	Positive %	Neutral %	Negative %
Feel comfortable	3.88	73.1	19.2	7.7
Feel better after the visit	3.87	65.4	28.8	5.8
Less anxious during visit	3.83	73.1	15.4	11.5
Mood was uplifting	3.77	65.4	26.9	7.7
Feel relaxed	3.75	65.4	26.9	7.7
Primary venue for meeting friends/family	3.67	63.5	17.3	19.2
Less overwhelmed during visit	3.62	65.4	9.6	25.0
Noise level suited to the activity	3.62	53.8	36.5	9.6
Sense of belonging	3.48	48.1	36.5	15.4
Use the café as a break/escape	3.44	51.9	25.0	23.1
Seating was comfortable	3.42	50.0	32.7	17.3
Staff welcoming / positive environment	3.38	51.9	19.2	28.8
Lower stress after the visit	3.19	34.6	50.0	15.4
Connected to broader Jordanian community	3.19	44.2	21.2	34.6
The physical arrangement provided privacy	3.13	36.5	42.3	21.2

B. The Psychological Cluster:

A clear pattern emerges when studying the four highest-scoring items:

Figure 4

Item	Mean	Positive Answer %
Comfort	3.88 /5	73.1%
Feeling better after visit	3.87 /5	65.4%
Mood uplifting	3.77 /5	65.4%
Relaxation	3.75 /5	65.4%

* The “Positive Answer %” refers to the percentage of respondents selecting 4 or 5 on the Likert scale. Thus, some items may share the same percentage, but due to the distribution of 4s and 5s, the mean can differ slightly.

Cafes produce immediate emotional ease consistently and reliably among all participants. Beyond improving positive emotional experiences, cafes also decrease negative psychological states:

- 73.1% of respondents reported low anxiety while in a cafe
- 65.4% reported low feelings of overwhelm

This double-sided pattern of improved positive affect alongside decreased negative experience suggests that cafes produce a real shift in psychological state.

However, it is important to note that stress reduction (Q5) was the lowest-scoring psychological item, with a mean of 3.19/5 and a positive response percentage of only 34.6%. This sits as a clear contrast to the positive cluster.

Due to this, a meaningful distinction appears between comfort and ease, which were reliably produced, and active stress relief, which did not occur. Therefore, it is understood that cafes in Amman soften emotional tone rather than regulate stress.

Supporting this is Q19, the item questioning well-being immediately after a visit. 65.4% of respondents stated their psychological well-being was highest directly after a visit. This reinforces the understanding that, despite little effect in stress relief, cafes still produce positive emotional outcomes.

C. Social Connection and Belonging

In terms of social purpose, the strongest finding is that 63.4% of participants cited cafes as their primary venue for meeting friends. Another notable finding is that belonging (M=3.8 /5) scored higher than the community connection (M=3.19) item, which poses an interesting conflict.

Through these findings, it is understood that cafes help patrons feel connected to the immediate social environment rather than the broader Jordanian community.

Interestingly, the belonging item posed as the strongest prediction of patrons feeling better after their visit ($r=0.45$). Further, respondents who scored higher on the belonging item (4-5) had a higher mean of stress reduction than those who scored lower.

Figure 5

Score on Belonging Item	Stress Reduction Mean
≥ 4	3.20 /5
≤ 3	3.00 /5

When belonging is felt, it meaningfully amplifies all psychological benefits of the cafe environment.

D. General Patterns:

1. Cafés are most strongly associated with comfort, reduced anxiety, emotional ease, and uplifted mood rather than with major stress reduction. Since only 34.6% of answers to the corresponding item were positive, with 50.0% being neutral, it is logical to conclude that cafes provide mild restoration and emotional ease rather than dramatic stress relief.
2. The social function of cafés is stronger than the “escape” function. 63.5% reported cafés as a primary venue for meeting friends and family, whereas only 1.9% reported using café visits as a break or escape. Combined with the fact that most respondents came for socializing or studying, this supports the idea that cafés in Jordan operate more as everyday social and functional third places than as private retreat spaces and that their psychological benefit does not stem from their use as an escape but from the social interactions within them.
3. The privacy item was rated lower across all 5 cafes. Signaling that patrons did not view these spaces as providing adequate privacy. However, overall comfort remained high even in the cafes with the least perceived privacy. Further consolidating the understanding that the psychological benefits of cafes stem entirely from their function as social support spaces.

5. Discussion.

5.1 Attention Restoration and Stress Buffering

The findings of this research suggest that the role cafes in Amman play in psychological well-being is more rooted in comfort than stress relief. Their function is more aligned with the Attention Restoration Theory (1995) than the Stress Buffering Hypothesis (1985). The survey item regarding comfort reached a mean score of 3.75 on the five-point Likert scale, noticeably lower than the stress item, which has a mean score of 3.19. While Cohen and Wills (1985) predicted that third places induce active stress reduction, the findings only loosely support that. However, it is important to note that the low stress reduction rate may not entirely be due to an inapplicability of Cohen and Wills’s work, but rather of low stress levels upon entering the cafe environment, thereby leaving little space for stress reduction. By contrast, the findings align well with Kaplan’s (1995) Attention Restoration Theory (ART), which predicted gentle, involuntary restoration and relaxation, which perfectly matches the survey items’ results. These findings allow for the deduction that cafes in Amman do not serve as a space for stress buffering, but almost entirely derive their psychological benefits from attention restoration. Significantly, when comparing the observation sheets and patron responses, a disconnect between the physical characteristics associated with attention restoration and the psychological restoration occurring. The most ART-compatible cafe, Melange, scored notably lower in items related to restoration when compared to other cafes. This gap can be attributed to the social function of the cafe. Melange’s patrons primarily used it as a productivity space. When compared to other cafes that may lack some ART-compliant features, but were used for socialization, Melange falls short on restoration. Therefore, it is logical to deduce that ART’s mechanism relies more heavily on emotional disengagement than on the physical attributes of the environment. While patrons in Melange were physically away, they had brought their responsibilities with them. This prevented

any restoration from occurring.

5.2 Physical Environment and Social Factors

When comparing patron responses across survey items, the relationship between each item becomes apparent and reveals patterns. To best understand how certain survey items interact and affect one another, the Pearson correlation coefficient was calculated.

The strongest predictors for patrons feeling better directly after their visit were social factors. Primarily, comfort ($r=0.61$), followed by mood uplift ($r=0.47$) and belonging ($r=0.45$). Notably, the physical environment items acted as very weak predictors: privacy ($r=0.33$), and noise suitability ($r=-0.04$). This reinforces the understanding that the cafes function primarily as social environments and that their restorative attributes are connected to their social purpose rather than their physical characteristics. However, this observation does not deny the interaction of physical environment and social factors within these cafes. Interestingly, in the case of Al-Ameed cafe, the low staff warmth was compensated for by a strong physical environment. Similarly, Fanak's objectively high noise level (72 dB) had little effect on patrons due to the high level of social warmth in the cafe. Although no set of factors can independently predict psychological outcome, when physical and social factors conflict, the social factors tend to dominate. This understanding directly mirrors that of Cohen and Wills (1985) of the importance of perceived support.

5.3 Cultural Hypothesis

Due to the belonging and community items receiving lower scores than expected, the cultural hypothesis could only be partially supported by the research findings. The belonging item had a mean of 3.48 on the five-point Likert scale, and the community belonging item received a mean of 3.19. However, the belonging item was correlated with patrons feeling better directly after their visit ($r=0.45$). So while cafes may not directly produce a sense of belonging among Jordanians in Amman, when belonging is felt, it directly affects the emotional experience of patrons and amplifies well-being outcomes. The hypothesised cultural amplification is conditional, not absolute. Nevertheless, it is important to understand that culture as a whole is very nuanced, and its effects on individuals cannot be measured solely by direct questioning, as a big part of culture is subconscious.

5.4 Cafes as Third Places

The findings broadly support Third Place Theory's (1999) characteristics; cafes in Amman do function as neutral ground used for non-obligatory time that facilitates social connection. 65% of participants reported feeling better directly after their time in a cafe, furthering the understanding that cafes function as third places in Amman and that they support psychological well-being as such.

However, Oldenburg described cafes as communal and inter-group, meaning that strangers

from different groups interact within them. Observation data showed that inter-group interaction was consistently absent from all 5 cafes, with their rating consistently falling between 0-2 /5. Patrons visited cafes to be near other people rather than to interact with them. The psychological benefit of cafes lies in the sense of social presence rather than conversation on display. The distinction between presence without interaction and the inter-group setting that Oldenburg theorized is precisely what Cohen and Wills (1985) discussed in their perceived support model. The mechanism through which Third Places provide their psychological benefit lies in perceived connection rather than actual connection.

6. Conclusion

6.1 Limitations of the Study

Some external limitations were faced during the data collection. Most notably, the demographics were skewed despite the best efforts of the researcher. Cafes in Amman are dominated by young patrons, which made it difficult to find older people to participate in the study. Moreover, men generally refused to partake in the survey, which led to the data being more skewed towards women. Ultimately, the demographics lean heavily towards young women due to the circumstances. However, the data remains proportional to the real cafe environment, with any imbalance lying in the hands of the environment. Another limitation of this study stems from the nature of its methodology. Due to its non-experimental nature, this study cannot determine causation. While correlation is prevalent in the findings. An experimental work is required to infer causation. Further, the small sample size poses a challenge to generalizability. Finally, the straightforward nature of the study does not fully encapsulate the nuance of culture and its effect on individuals, as culture is largely subconscious.

6.2 Future Recommendations

This study advances the empirical work surrounding third places in Eastern societies, their function as everyday social environments, as well as their relationship to wellbeing. Using the combination of survey responses and direct cafe observations, the findings highlight how environmental qualities and patterns of use shape individuals' experiences in cafes with regard to cultural values of belonging and community. The results of this study suggest that cafes can support aspects of psychological well-being by providing accessible third-place environments that facilitate social interaction, support, and comfortable engagement with the surrounding community.

Future research can expand on this work by examining a larger sample of cafes and participants, as well as investigating why certain demographics may be more prominent in cafe environments. Further, recreating the study across different cities and cultural contexts could allow for a more holistic understanding. Future research could also explore different methods of data collection. Adopting an experimental nature would allow for causation to be inferred, thereby better grasping the effect of individual attributes of a cafe. Similarly, a longitudinal approach would allow

for the evaluation of how repeated exposure may affect well-being over time.

6.3 Concluding Statement

Cafes in Amman, Jordan, serve a consistent and meaningful role for their patrons. They reliably provide comfort and ease for their users and suppress negative effects. Though they do not provide active stress relief, as in Western contexts, they ease negative experiences through reliable comfort, ease, and social warmth. Cultural values of belonging and community conditionally amplify these benefits. When belonging is felt, the effects of the cafe increase; however, the cafe environment does not guarantee feelings of belonging. Cafes in Amman, Jordan, are spaces in which restoration, work, and socialization interact in a way that Western frameworks did not predict.

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Appendices.

Appendix A: Survey Questions.

I. Cafe Usage Habits (Frequency)

These questions establish the respondent's baseline behavior related to cafe visits. II.

How often do you visit a cafe?

- A. (1) Never
- B. (2) 1-3 times per month
- C. (3) about once or twice a week
- D. (4) multiple times a week (8-15 times per month)
- E. (5) daily or almost daily

III. What is your primary reason for visiting a cafe in Jordan? (Select one) A. (1)

Socializing with friends/family

- B. (2) Working or studying
- C. (3) Relaxation or "alone time."
- D. (4) Enjoying coffee/shisha/food/ambiance

IV. Which type of cafe setting do you visit most often? (Select one)

- A. (1) Traditional/local 'Qahwa' or shisha cafe
- B. (2) Modern, international chain (e.g., Starbucks)
- C. (3) Local, chain modern cafe/specialty coffee shop (e.g., Coffee Bean, Qahwa BLK) D.
- (4) No preference / Varies greatly

V. When you visit a cafe, are you typically?

- A. (1) Alone
- B. (2) With one other person
- C. (3) With a small group (3-4 people)
- D. (4) With a large group (5+ people)

II. Stress and Mood

These questions use a 5-point Likert scale (Strongly Disagree to Strongly Agree) to assess the impact on stress and mood.

Statement	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
5. I often visit a cafe specifically to reduce my stress level.	1	2	3	4	5
6. I use cafe visits as a "break" or escape from daily worries/responsibilities.	1	2	3	4	5
7. The environment in this cafe helps me feel less anxious than when I am home.	1	2	3	4	5
8. I feel better after spending time at this cafe.	1	2	3	4	5

III. Social Connection in Cafes

These questions explore the role of cafes in fostering and maintaining social ties, using the same 5-point Likert scale.

Statement	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
9. Cafes in Jordan are my primary venue for meeting up with friends and family.	1	2	3	4	5
10. Spending time in cafes helps me feel less alone than I would otherwise be.	1	2	3	4	5
11. When I visit a cafe alone, I still feel a connection to the community around me.	1	2	3	4	5

IV. Cultural Value of Belonging & Community

These questions aim to capture the perceived influence of the Jordanian cultural emphasis on belonging and community on the cafe experience, using the 5-point Likert scale.

Statement	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
12. The Jordanian value of hospitality (Karam) is clearly reflected in the atmosphere of local cafes.	1	2	3	4	5

Statement	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
13. Spending time in this café makes me feel like I belong to a community.					
14. I feel as though cafés bring the community together.					
15. I feel like I have something in common with the people in the café.					

V. Overall Psychological Well-being

These questions synthesize the reported psychological effects and link the experience to overall well-being.

4. Compared to the rest of the week, I would rate my overall psychological well-being as highest immediately after a cafe visit.

- (a) Yes, definitely
- (b) Yes, somewhat

- (c) No difference
- (d) No, somewhat lower
- (e) No, significantly lower

5. How would you describe the main function of cafes in terms of Jordanian social life? (Select one)

- a. (a) Primarily for consumption (food/drinks)
- b. (b) Primarily for personal work/study
- c. (c) Primarily for private social gatherings
- d. (d) Primarily as a general community gathering space
- e. (e) A balance of all the above

VI. Physical Environment & Atmosphere

Statement	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
The lighting, music, and overall atmosphere in this café make me feel relaxed and comfortable.	1	2	3	4	5
The design, furniture, and cleanliness of the café influence how much I enjoy spending time here.	1	2	3	4	5
The physical layout (seating arrangement, openness, or privacy) allows me to feel at ease and focus on myself or others.	1	2	3	4	5

VII. Demographics

9. What is your age group?

- (a) Under 18
- (b) 18–24
- (c) 25–34
- (d) 35–44
- (e) 45 and above

10. What is your gender?

- (a) Female
- (b) Male

11. What area of Amman do you live in?

- (a) West Amman
- (b) East Amman
- (c) Outside of Amman

Open-ended (free response)

24. Which café are you currently in while filling out this survey? (Please write the name of the café.)

Appendix B: Observation Sheet Template.

I. Cafe and Time Context

Variable	Coding / Measurement	Answer
Observation Date	[YYYY-MM-DD]	
Observation Time	[HH:MM] to [HH:MM] (Record start and end time)	
Cafe Name	[Name of Cafe]	
Cafe Type	(1) Local/Independent (2) International Chain (3) Local Modern Shop	
Primary Activity	Dominant patron behavior (e.g., Socializing, Studying, Solo Leisure)	
Seating Capacity	Total number of seats available	
Occupancy Rate	(Estimated occupied seats / Total seats) $\times 100$: []%	

II. Environmental Features (Testing ART)

Use 5-Point Rating Scale: 1 = Low/Poor/Unsuitable | 5 = High/Excellent/Highly Suitable

Variable	Description / Coding Notes	Rating (1-5)
Noise Level (Objective)	Use a simple dB meter app (1=Too loud for conversation, 5=Perfectly suitable for quiet work)	
Privacy (Spatial Configuration)	Extent of visual and auditory barriers (e.g., booths, partitions, distance between tables). (1=Open hall, 5=Highly segmented, many private areas)	
Lighting Quality	Suitability of lighting for reading/working and relaxation. (1=Too dim/harsh, 5=Ideal mix of ambient/task lighting)	
Restorative View	Presence of nature/art/interesting features outside or inside (a focus for Kaplan's ART). (1=Blank wall, 5=Pleasant view or stimulating visual interest)	
Cleanliness / Maintenance	Overall tidiness, organization, and maintenance of furniture/space.	

III. Patron Demographics and Interaction Patterns

Variable	Description / Coding Notes	Count / Rating
Count: Solo Customers	Tally of individuals sitting alone (studying, working, or leisure).	Count: []
Count: Dyads/Pairs	Tally of groups consisting of exactly two people.	Count: []
Count: Small Groups	Tally of groups consisting of 3 to 4 people.	Count: []
Count: Large Groups	Tally of groups consisting of 5 or more people.	Count: []
Observed Social Engagement	Frequency of active, verbal interaction between patrons. (1=Silent, working/phone use only, 5=Constant, energetic conversation across most groups)	Rating (1-5)
Observed Emotional Intensity	Conversations with visible signs of deep, potentially emotional/serious conversation (e.g., intense focus, physical comforting, hand gestures).	Count: []
Observed Inter-Group Interaction	Frequency of patrons interacting across <i>different</i> groups (e.g., greeting, brief chat with neighbor). (1=No interaction, 5=Frequent interaction/communal feel)	Rating (1-5)
Tech Usage Rate	Estimated percentage of patrons actively using a laptop or phone for work/study.	Est. %: []

IV. Social & Staff Features (Third Place / H3)

Variable	Description / Coding Notes	Rating (1-5)
Staff Presence	How visible and accessible are staff members for assistance? (1=Rarely seen, 5=Highly visible and available)	
Perceived Staff Friendliness	Based on visible interactions (e.g., smiles, proactive check-ins). (1=Cold/Transactional, 5=Warm/Welcoming/Engaging)	
Seating Adaptability	Ease with which seating can be rearranged for different group sizes. (1=Fixed/Rigid, 5=Highly flexible tables/chairs)	
Mix of Activity	Diversity of patron activity observed (e.g., solo study, group meeting, family, leisure). (1=Uniform activity, 5=Diverse mix of activities)	

V. Qualitative Notes

Focus Area	Notes	Answer
Third Place Qualities	Note any unique features that promote belonging or community (e.g., communal tables, notice boards, local art).	
Acoustics/Music	Note the type of music/sound environment (e.g., loud Arabic pop, soft jazz, silent).	
Other Notable Factors		

Appendix C: Expert Interview Questions.

Interview I: Clinical Psychologist (Expert 1)

Interviewee: Clinical Psychologist specializing in mental health promotion and community well-being (BPS Chartered, Clinical/Neuroscience focus).

Interview Goal: To validate the theoretical framework of stress mitigation (ART/Social Support) and the psychological function of community spaces.

I. Introduction and Background

- VI. Please briefly describe your clinical practice and your academic focus regarding mental well-being at a community or population level.
- VII. How does your understanding of Clinical Psychology inform your view on the importance of informal, accessible public spaces (like local cafes) for the overall mental health of a city's residents?

II. Theoretical Grounding: Restoration and Stress Mitigation

- Given your background in Neuroscience and Clinical Psychology, can you discuss the neural or cognitive mechanisms behind the Attention Restoration Theory (ART)? How does an environment like a cafe allow the brain to recover from directed attention fatigue?
- My survey measures a comparative reduction in stress after a cafe visit. From a clinical perspective, what elements of the cafe experience (e.g., sensory environment, lack of obligation) might trigger a rapid, measurable stress-mitigating response?
- How might the sensory environment (e.g., ambient sound, subtle aromas) of a Third Place be used as a tool for mood regulation or as a form of behavioral activation in individuals experiencing mild depression or anxiety?

III. Social Connection and Community Well-being

- In a culture with strong family ties like Jordan, how do "weak ties" formed in a Third Place¹ contribute to an individual's psychological resilience and sense of belonging?
- How can the concept of community well-being (a core part of your expertise) be promoted simply through the existence and use of supportive, non-commercial gathering spaces?
- How does a person's perception of a space's authenticity or cultural identity influence their sense of psychological comfort and belonging within that environment?

¹ The phrase "Third Place" refers to a psychological theory established by Ray Oldenburg which states need 3 kinds of spaces; Home, Work, and Third Places. Third Places strengthen social connectedness as well as lessen isolation.

Interview II: General Practitioner (Expert 2)

Interviewee: Medical Doctor and Clinical Psychologist specializing in CBT/DBT/CAT, focusing on anxiety, depression, and emotional regulation.

Interview Goal: To frame the cafe experience within practical emotional regulation strategies and the specific mental health challenges of young adults.

I. Introduction and Background

- c. Given your background in Medicine and Clinical Psychology (CBT/DBT), how do you view the relationship between an individual's immediate physical environment and their ability to manage anxiety or regulate intense emotions?
- d. In your work with children and adolescents, how frequently do environmental or social isolation factors contribute to issues such as anxiety, depression, or emotional dysregulation?

II. Applied Clinical Frameworks: Emotional Regulation

- 12. The cafe environment is often used as a form of "escape." Drawing on Dialectical Behavior Therapy (DBT) principles, would you classify a cafe visit as a form of distress tolerance or self-soothing? How could a relaxed public space support these emotional regulation skills?
- 13. My research looks at social connection. How does visiting a cafe with others (social support) act as a specific, evidence-based intervention against feelings of isolation or loneliness, particularly for young adults?
- 14. In the context of Cognitive Behavioral Therapy (CBT), a cafe could be considered a safe, neutral ground for exposure. How might the act of simply being present and engaging in routine social behavior in this space help mitigate social anxiety symptoms?

III. Third Place and Cultural Context

- Do you observe any cultural factors specific to Jordanian society that might make the cafe a more necessary or intense source of social support and autonomy compared to Western cultures? (Consider the pressure on young adults or specific social expectations.)
- The cafe environment facilitates brief, low-stakes social exchanges (e.g., with baristas or nodding to a regular customer). What role do these "weak ties" play in preventing the cycle of social withdrawal often seen in anxiety and depression?
- From a clinical perspective, what is the perceived friendliness and welcome from staff that makes space feel safe enough to relax and engage in restorative behavior, truly?

Appendix D: Expert Interview Transcripts.

a. Interview 1, Clinical Psychologist.

Researcher: First, at the beginning of the recording, I'd like to confirm that I have your permission to record

Interviewee: 100%.

Researcher: Okay, perfect. So let's start our interview number one. Can you please briefly state your clinical practice and academic focus regarding mental well-being at a community or population level?

Interviewee: Of course. So in my clinical work, I specialize in psychological flexibility, emotional regulation, and evidence-based interventions that support individual and community mental health. Alongside therapy, a significant part of my academic focus involves understanding how environments and social structures influence psychological well-being.

This includes population-level mental health promotion, mental health literacy, and community-based support. That creates accessible pathways to wellbeing outside formal clinical care. I'm particularly interested in how everyday public spaces can function as an informal mental health regulator.

Researcher: How does your understanding of clinical psychology inform your view on the importance of informal accessible public spaces or the overall mental health of a city's residents?

Interviewee: From a clinical perspective, mental health is not shaped solely by internal psychological processes, but also by the environment people inhabit. Informal and accessible spaces, such as local cafes, function as low-barrier regulators: places where people naturally decompress, experience autonomy, and engage in low-effort, social interactions.

These elements help buffer stress, reduce loneliness, and support mood regulation. Clinically, we see that many people benefit from structured engagement, like behavioral activation. In environments that are predictable, safe, and socially, even when they are not seeking formal mental health support. So cafes often fulfill that role within a community.

Researcher: Thank you. Given your background in neuroscience and clinical psychology, can you discuss the neural or cognitive mechanisms behind the attention restoration theory? How does an environment like a cafe allow the brain to recover from directed attention? Fatigue.

Interviewee: So the ART Attention Restoration Theory aligns with what we know in cognitive neuroscience.

Prolonged directed attention exhausts the prefrontal cortex, which leads to cognitive fatigue, irritability, and decreased emotional regulation. Restrictive environments allow the brain to shift into. Effortless attention, which reduces the prefrontal cortex load. And this enables the default mode network, DMN, associated with reflection, creativity, and emotional processing, to re-engage the combination of reduced cognitive demand and gentle sensory engagement, facilitating psychological recovery cafes.

Especially when designed with natural light, predictable noise levels, and comfort, as aesthetics naturally support these cognitive transitions.

Researcher: My survey measures a comparative reduction in stress after a cafe visit. From a clinical perspective, what elements of a cafe experience might trigger a rapid, measurable stress-mitigating response?

Interviewee: So several components contribute to a quick stress-mitigating response, to begin with, predictability. So familiar routine, sitting in the same spot. Ordering a known drink increases psychological safety. Number two, decentralized attention, ambient noise, and background activity, draw attention outward, reducing internal rumination.

A third aspect is autonomy, the lack of obligation. So there's no required interaction, no pressure, and this creates a sense of control, which is a core variable in stress reduction. As well as sensory grounding. So with the warm lighting, moderate noise, human presence, and comforting aromas not really activate the parasympathetic nervous system and helps regulate the stress response. So even a brief visit can create a shift in psychological or physiological arousal, which is why many people report immediate relief or clarity after spending time in such places.

Researcher: How might the sensory environment of a third space be? Be used as a tool for mood regulation or as a form of behavioral activation in individuals experiencing mild depression or anxiety.

Interviewee: This is a really interesting question because the sensory qualities of a third place often serve as a subtle tool, therapeutically. To begin with, ambient. Sounds can provide gentle sensory input that prevents overthinking. Aromas, such as coffee or baked goods, often function as grounding cues that evoke comfort or familiarity.

Warm colors, natural textures, or greenery help the brain shift towards relaxation and emotional openness. And behavioral activation for individuals with mild depression or anxiety. Simply leaving the house and entering a stimulating, socially rich environment interrupts withdrawal patterns. The cafe becomes a structured positive activity that increases mood-enhancing experiences.

So these elements contribute to immediate emotional shifts and long-term coping patterns. So this

really just focuses on mostly on mindfulness interventions. And how integrating your senses in the present moment can disrupt such negative patterns.

Researcher: Okay, thank you. In a culture with strong family ties like Jordan, how do weak ties formed in a third, in a third place contribute to an individual's psychological resilience and sense of belonging in collect, in collectivistic culture like Jordan? Strong family [00:05:00] ties coexist with an increasing need for new, neutral, pressure-free, social spaces.

Interviewee: So weak ties, such as brief interactions with familiars, strangers, baristas, or regulars, provide a sense of being noticed without being evaluated. social predictability, micro moments of affirmation and relief from the expectation of family or workloads. These interactions enhance psychological resilience by increasing perceived social support and reducing, known.

So weak ties, especially, are powerful in social situations where people may hesitate to discuss mental health; openly, light social contact often becomes a subtle emotional buffer.

Researcher: Okay. How can the concept of community wellbeing, a core part of your expertise, be promoted simply through the existence and use of supportive non-commercial gathering spaces?

Interviewee: Community wellbeing is strengthened when people have access to environments that feel safe and welcoming. Allow them to regulate emotions without cost or stigma. support informal social interactions and provide a sense of identity and continuity. So such places foster a sense of coherence.

The belief that life is manageable, meaningful, and connected, even when cafes are commercial, their function as third places can provide community-level mental health benefits by reducing isolation, enhancing belonging, and creating shared cultural rhyme.

Researcher: Perfect. How does a person's perception of spaces on authenticity or cultural identity influence their sense of belonging, comfort, or emotional connection within it?

Interviewee: So a person's emotional response to a space is shaped by how, inherently, it aligns with their cultural expectations, values, and identity. In Jordan, spaces that reflect local hospitality, warmth, and communal energy tend to feel more psychologically safe and familiar.

When a cafe incorporates cultural cues, welcoming staff, familiar rituals, and local design elements, individuals experience a deeper sense of belonging. This also amplifies the restorative and social benefit of the space, making it more than just a venue for consumption, but a meaningful extension of community life and increasing their sense of belonging.

Researcher: Okay. Thank you so much.

Interviewee: Thank you for choosing me to be a part of this interview.

b. Interview 2, Medical Doctor

Interviewee: Hi.

Researcher: Hi, Dr. Before we start, I'd like to confirm that I have your consent to record this.

Interviewee: Mhm

Researcher: Perfect.

Interviewee: You, do you have my consent, a more full verbal consent? Yes, you do.

Researcher: Perfect. Let's start with the questions.

Interviewee: Okay. Go ahead.

Researcher: So, given your background in medicine and clinical psychology, specifically CBT and DBT, yeah. How do you view the relationship between an individual's immediate physical environment and their ability to manage anxiety or regulate intense emotions?

Interviewee: I think there's definitely a correlation between both. So if we have an environment that's very calm and relaxing, then a person would be able to reflect that external environment within them. And if it's a bit more chaotic on the outside, then they can also, it'll also be reflected on the inside. Yeah. And then I also think, in terms of, let's say specifically with anxiety, having that calm, familiar environment on the outside can really help reduce that anxiety, 'cause a lot of the time that anxiety comes from the unknown. And unpredictable situations. So if you already know what this is, what the environment is going to look like, and you can already predict how it'll be, then that also reduces the unrest, maybe that you could feel from anxiety. In terms of regulating intense emotions. I think it does help having an environment where you might see familiar faces, you might see people in similar situations. So being in that environment can make you feel like, "Oh, okay. I'm not alone." So it does help with those emotions, too. And you can form those relationships within that environment, which can also help with sharing those emotions and trying to, and realizing you're not really alone in all of that.

Researcher: Okay. Thank you. In your work with children and adolescents, how frequently do you do environmental or social isolation factors contribute to issues such as anxiety, depression, or emotional dysregulation?

Interviewee: I think it's very frequent. We don't realize, so what we believe over here is that who you are, you're made up of your genetics and your memories. And your memories are formed through those through the external environment. Yeah. So basically, it's your genetics

and your external environment. And a lot of the time we have people who... yes, there can be a genetic pre disposition for anxiety or depression, ADHD, or whatever it is.

And sometimes they might not have that genetic predisposition. But it's the environment that really does influence how they end up feeling. Because if you're unable to have a good support system, then you're unable to express yourself in certain ways, and then you feel a lot more alone, and feeling alone makes you have a lower mood.

Lower mood comes, makes you basically want to, we're going down that path of depression. Yeah. We're going down that path of anxiety because we feel like we're alone. We start to think a lot. So it's definitely there is a big correlation, especially I think in our own society where there's that there's, that there's a big social pressure on kids these days that they need to be engaged in the world. especially with how social media is like 20 years ago, we weren't as connected as we are now. And so there, I don't think there was as much pressure maybe 20, 30 years ago, the way that there is now. Because everyone is trying to form connections with each other. So if that connection doesn't happen, then. Then someone goes, " Okay, but what if it's me. Rather than what if I haven't found my community? It's more of, okay, what if the problem is with me? Yeah. So it does cause those issues.

Researcher: Yeah. Okay. The environment, the cafe environment, is often used as a form of escape. Okay. Drawing on dialectical behavior and behavior therapy principles. Would you classify a cafe visit as a form of distress, tolerance, or self-soothing? How could a relaxed public [00:04:00] space support these emotional regulation skills?

Interviewee: I think it could be more of self-soothing. because when you're in that area, yeah. Distress tolerance, maybe not. It could, but I think it's more self-soothing because you're able to activate your senses. You're able to feel a bit more grounded. Yeah.

You're able to have that. I'm not alone. Sensation. Yeah. And I think it really does support that. It really does make a person feel like, I'm not physically alone. Yes. And it gives that sense of community, which makes you feel a lot calmer. I think it. We, I think it would be more self-soothing in a sense.

Researcher: Okay. Thank you. My research looks at social connection. How does visiting a cafe with others, so social support, act as a specific evidence-based intervention against feelings of isolation or loneliness, particularly for young adults?

Interviewee: So, evidence-based intervention, this and visiting these cafes would definitely be behavioral activation. One of the things that we focus on in CBT and cognitive behavioral therapy is behavioral activation. Okay. And in behavioral activation, we try to find something that a person can do to make sure that they're getting out of their comfort zones in a way. In a progressive manner. And also making sure that they're doing things they actually do want to do. So there are a lot of people who do want to go out to these places. They do want to have those experiences with others. They don't wanna feel as lonely. And the opposite of being lonely or isolated is being in a crowd, being with people, right? And having those interactions. So we try and, like, within a session, we can then try and figure out, okay, so if we don't wanna be lonely, we don't wanna be isolated, then what are the things that we can do that are something that's not too stressful. Yes. So it's not okay, go and talk to someone, right? The cafe is a very calm

environment. What do we think about having that slow exposure, let's say, into the social environment by being in those areas and [00:06:00] having something to do, let's say, studying, working, whatever it is, it keeps you busy, but then it also keeps you, it makes sure that you're actually doing something.

Because behavioral activation, at some point, is mainly about. When you're doing therapy, it's about you wanna change certain things in your life. And we can change certain thoughts, we can change certain perceptions that we have. But also, we can help with changing physical things. Things that a person can say, I physically change these things. Rather than staying home alone, I've decided, I started telling myself, okay, I need...

Researcher: Sotangible?

Interviewee: Thank you. That's the exact word I was looking for. So a tangible change, yeah. That they can evaluate too. My thoughts have changed, and I cannot evaluate that easily, but then they can actually tangibly evaluate that, okay, I started going out more.

Yeah. They feel better about themselves. They can see the differences. So, definitely behavioral activation does help with that.

Researcher: Okay. In the context of cognitive behavior and therapy. A cafe would be considered a safe, neutral ground for exposure. How might the act of simply being present and engaging in routine social behaviors in the space help mitigate social anxiety symptoms?

Interviewee: So, we're gonna go into graded exposure at this point. So when we're talking about social anxiety, it's that nervousness that you feel when you're, when you need to speak to someone or when you want to interact with any human. You freak out, simply put. When you go to a cafe, your interactions are quite limited. You, the first thing that you're doing is you're talking to the person at the cash, just ordering, and then you go, and you sit down. And it can help because it's those limited, those small, minor interactions.

That's the graded exposure, that's putting yourself. Taking yourself outside of your comfort zone. And then sitting down in that environment can also help because when it comes to feeling that anxiety, that social anxiety can be felt by a lot of people. It can be felt by people with anxiety.

It can be felt by people with ADHD. It can be felt by people with a lot of things. [00:08:00] It doesn't have to necessarily be a diagnosis, let's say. And having that environment where you can see other people doing the same thing that you're doing, it's something called body doubling. So, body doubling basically, it gives that sense of calm.

That someone is also doing something that you are doing at the same time. And that's like sitting down, having a coffee, whatever it is. So not only is the cafe like a good, let's say, place where you're able to have that graded exposure of an interaction. But then also you're staying in an environment that can cause anxiety, but seeing other people doing the same in that body doubling sense reduces that anxiety for you. And the more and more you have, those experiences, those interactions, the more comfortable you become. And the fewer those symptoms, or the less difficult those symptoms become. Or the less difficult they are to handle, let's say. And then suddenly it becomes more of a familiar environment.

You can then up the dose, let's say of interactions, and you can speak to other people, le and it helps with that social anxiety feeling.

Researcher: So, going back to what you just said about the small interactions in cafes, yeah. Would you say that aligns with the concept of weak-tie social support?

Interviewee: I wanna say yes. Yes, absolutely. Because it's those little interactions that make a person not completely isolated. It's those little interactions where... It's that good morning. How are you? It's that little small talk that you have with those people, like with the baristas with those people. It's those little interactions that make us, because people are still having those interactions. You make sure that these ties are still happening, this connection is still happening. We make sure that we're not allowing someone to completely self-isolate. Because when you're put in a scenario that you have to go into a cafe, you're gonna need to order something. Yeah. And I know some cafes now have, you don't need to order at all. Like [00:10:00] from a human, you can just scan a photo or whatever. But there is still that "Oh, thank you." Still, those words that are being exchanged and that is a form of connection in the end of the day that we want to keep having. And so it does play a role, and it is an important role because it is simple graded exposure. That keeps the communication and connection between people that we want. So, in short, the interactions in the cafe would align with the concept of sweet ties. Yeah. Okay. Absolutely. Thank you. Moving on to the next question. Do you observe any cultural factors specific to Jordanian society that might make the cafe a more necessary or intense social source of social support and autonomy compared to Western cultures?

Feel free to consider the pressure on young adults or specific social expectations. I think yes to a certain extent because. A cafe is a very controlled environment. Yes. Yeah. It's not something that any Jordanian parent would be scared to send their kid there. Yeah. And I think in Western cultures it's a bit different, because kids in school ages, let's say teenagers they not necessarily hang out at cafes. They'll be hanging out in different places, maybe. If our own cultures were to look at it, they'd be like, okay, maybe that's dangerous. Yeah. That's not, that doesn't align with our own values.

And they're just not environments that we would expect teenagers to be. Maybe older people. Yeah. But even then, it doesn't really align with our own values. And also, if we're looking at it in terms of space in Jordan, it's not like we have that much space. People, maybe teenagers outside, can hang out in parks.

It's not like we have. Or maybe we do, it's just easier, you're not money parts. Yeah. And it's not very accessible as it is in Western UMS countries. Yeah. Yeah. But I think cafes are quite acceptable over here. Yes. It creates a sense of safety and security for not only the kids but also the parents.

Yeah. And we know that in our own culture, parents' approval is usually what. What everyone looks for. And so if the parents are okay with it, we're all okay with it. It becomes that thing where it's you know what we're, we wanna hang out at a cafe, and the parents are obviously gonna say yes. So it is definitely important.

Researcher: Okay. So would you say that cafes would act as a replacement for other third places

that we might find in Western countries here in Jordan?

Interviewee: Yeah, probably. Because it is one of those places... It's always packed on a Thursday night in Jordan cafes are all packed. Absolutely. Yeah, I do think so.

Researcher: Okay. The cafe environment facilitates brief, low-stakes social exchanges. For example, with baristas or nodding to a regular customer. What role do these weak ties play in preventing the cycle of social withdrawal often seen in anxiety and depression?

Interviewee: I think it goes back to the fact that we're doing that graded exposure. We're making sure that people aren't really.... because sometimes we have that thought of "I'm alone". And our thoughts are so strong that they can influence how we feel and then influence how we act. So if our thought is we're alone, there's no one to interact with, we might feel like we're incompetent in a way... That we're unable to have interactions or those interactions. And then, therefore, we self-isolate even more. So if we have those interactions and our brain remembers those interactions as good interactions. So then that means that the memories we have become good memories of interaction with others. Then we want to repeat those interactions. And therefore, we continue trying to go for those interactions themselves. And it's just a simple, "Hey, I'd like this coffee, or I'd like that". Or "what do you have?" So instead of it gives that it's a controlled conversation. You're not trying to make small talk, as in what's the weather like? But instead of it becoming, okay, I'd like this, it can then turn into what do you have to offer. So it can gradually become more; there can be more of an exchange that happens between two people.

Yeah. With those in that scenario, and then it just becomes something where the person can work on those social skills, and we make sure that person doesn't really self-isolate completely.

Researcher: From a clinical perspective, to what extent is the perceived friendliness and welcome from staff important in making a space feel safe enough to truly relax and engage in restorative behavior?

Interviewee: Clinically? Very important. Because if the staff is welcoming, then you already feel calm. Your first interaction is with the staff. You already feel calm. Mind you, there are some people who may not like a friendly staff.

Researcher: Really?

Interviewee: Yeah. Because they prefer not to engage from the start. So they might find it to be a bit anxiety-inducing. But in general, if we look at it from a clinical perspective, it does help make a person feel a lot more relaxed. And when you're relaxed, you're not in stress mode, your body is not feeling stressed. If it's not feeling stressed, then it can have that restorative behavior that you're talking about.

So there's no fight or flight. If there's no fight or flight, then I can relax. I can feel better. I'm making good memories. Everything is much better. I think the reason why I am emphasizing that friendliness and that welcoming are so important is because it's something that we also ensure is done over here.

In our clinic, our administrative staff was not welcoming, and they were not friendly. Then it would be more of a hostile environment. You'd have people being uncomfortable, you'd have a lot more complaints. It just wouldn't, it would be more stressful. People would walk into sessions, and they'd be stressed out anyway. From an interaction that happened outside. Sometimes, and that's why it's important for us, that our staff is also friendly because when they are friendly, sometimes, even if they're coming in and they're angry, they can come in after having that nice simple interaction with someone from the administrative team, they calm down, they walk in and they're calm. I've heard I had a bad day, but the person outside was so nice, and now I feel better. So it's those little interactions that make you realize how important it is to be friendly, to be welcoming as staff, because it really does calm a person down. And make sure we're not in that stress flight, fight or flight type of mode, and really make sure that the person is able to just be relaxed.

Researcher: Okay. Just before we wrap up, I wanted to refer to a concept you referred to multiple times in your answers. Graded exposure. Can you please elaborate on that a little further?

Interviewee: Graded exposure is basically if we have an issue with a certain social situation that we're scared of or ... let's stick to social situations, 'cause social situations are quite common. What we do is we try and, in graded exposure, we try and make sure that we create, let's say, maybe a bunch of situations, and we see which one is the least anxiety-provoking situation for the person. And then we slowly start going through each of those steps. Yeah. And we need to make sure that a person, when they're going through that graded exposure, the reason why we're doing it is that we want to get to the point where they feel zero. Anxiety when they're in that situation, when they're in that social situation.

Tell me, go ahead.

Researcher: So it goes from lowest anxiety-inducing to highest.

Interviewee: Exactly. So usually the highest is going to be that social situation, right? We don't wanna throw them into that because it's terrifying, and we don't know what the outcomes can be, right?

So we wanna make sure that it's a slow exposure to that situation because it's not just. I'm scared of going to the dentist, let's say. There are so many other things that get to that point where I'm scared of going to the dentist. Or I'm scared of going out with friends. There are so many other things.

There can be, I'm scared of saying the wrong thing, I'm scared of this, I'm scared of that. And then it creates this massive situation that you're scared of. So we start working on those little things, making sure that we expose a person to those little things while also teaching them grounding techniques or breathing techniques. Or breathing exercises to make sure that they have that safety. If they feel the anxiety coming on a bit too strongly. Then they're able to go back and be like, okay, no, I'm still present. I'm here. You are engaging in your five senses. Maybe doing progressive muscle relaxation.

One of the techniques that we have to make, remind ourselves that we're not really in our brain and thinking too much. We're actually in the present, in the here and now. 'Cause that's what happens when you've got that anxiety. You start thinking a bit too much. So we wanna bring you back into the present, and graded exposure helps us.

In a very controlled way and in a very safe way. Make sure that we're able to address that fear head-on. But slowly. And we need to make sure that each stage is done completely, they are completely fine with it before we move on to the next stage, because we don't want it to be a thing where we've moved on to the next stage a bit too quickly.

And then they are like, " No. A bad experience, I'm back to square one. So it has to be something that's a bit slower, and it depends on the person, too. Some people it's a bit quicker than others in terms of timeline, and some people it's a bit slower, but in the end of the day, they're doing the brave thing, and they're actually facing it head on.

Whether it's little microdoses of it or really big things of it.

Researcher: Okay. Thank you so much for your time. I very much appreciate it.

Interviewee: Thank you.

Checking the Wrong Boxes: Psych-Up Misalignment in High School Athletics

James Tillotson

Abstract: This study investigates the alignment between high school athletes' preferred "psych-up" techniques and the optimal arousal levels required for their respective sports, as described by the Inverted-U and Catastrophe theories of arousal. Using a mixed-method design consisting of 195 survey responses across 30 sports and 9 in-depth interviews, this research examines whether athletes intuitively select preparation strategies that match the physiological demands of their sport. Results indicate that while athletes broadly recognize psyching up as important (mean importance rating: 4.05 out of 5), the majority demonstrate significant misalignment between their chosen techniques and their reported optimal arousal states. Aggressive music and physical stimulation were the most commonly used strategies across all sports, yet 60% of respondents identified "relaxed confidence" or "calm and focused" as their ideal peak performance state. Sport-specific analysis revealed that precision and endurance sports — swimming, golf, baseball, and distance running — showed the greatest misalignment, with technique accuracy rates as low as 25–33%. Additionally, approximately 27% of respondents reported their techniques becoming counterproductive, consistent with the Catastrophe Theory's characterization of performance deterioration following arousal threshold breaches. These findings suggest that high school athletes predominantly select psych-up methods based on ritual or superstition rather than performance optimization, and that targeted education on arousal-matched preparation strategies could meaningfully improve athletic performance.

Keywords: psych-up techniques, athletic arousal, Inverted-U theory, Catastrophe theory, high school athletics, sports psychology, pregame preparation

1. Introduction

This paper aims to deepen understanding of “psych-up” techniques as depicted in media, athletics, and the broader contemporary sports landscape, clarifying their complex role in athletic arousal through an analysis of various strategies. While the topic of preparation for an athletic event — such as supplementing with caffeine, maintaining positive self-talk, or attempting to relax the mind and body — has been documented extensively in the realm of individual sports, there is little evidence to solidify a direct correlation between the athletic activity being performed and the chosen method of preparation. The findings of this paper will determine whether, to a certain degree, the physical intensity and required arousal level of a sport to reach maximum performance (as demonstrated in the Inverted-U theory) dictates the chosen or preferred method of “psyching up.”

Arousal itself can be defined as “a general mixture of both the physiological and psychological levels of activity that a performer experiences,” and can be assigned a certain intensity based on the sport it is associated with (Gbadamosi, 2020). The article “Emotion and Sport Performance” details how arousal can affect the emotions and mood of an individual during their activity, as well as the inverse relationship. It is important to note that while mood and emotion may seem interchangeable, they are not. The term “emotion” refers to brief stints of extreme feeling, while “mood” refers to the larger-scale, longer-lasting feelings. Janelle and colleagues concluded that there is predominantly research into how negative emotions affect an athlete, but comparatively little on positive emotions, and that research as a whole remains generally scarce (Janelle et al., 2020). In a competitive field such as sports, gaining a slight edge with minimal effort is crucial to success.

The scientific literature in this field remains relatively limited, underscoring the need for additional research to advance the existing body of knowledge. This research aims to fill the preexisting gap in knowledge about the correlation between optimal arousal levels and psych-up techniques, specifically among high school athletes. The central research question is: How does a high school athlete's sport of choice impact their preferred “psych-up” method of sports preparation? Based on preliminary research, the hypothesis is formed that as a sport's required level of arousal for optimal performance increases, so will the emotional and physical stimulation intensity of the psych-up strategy.

1.1 Why Psych Up?

The term “psych-up” is inherently broad, serving as a general descriptor for athletic preparation without narrowing the capabilities of its usage. An athlete can choose at will what they wish to do in order to perform better based on their prior knowledge and personal experience. However, it is because of this breadth that the legitimacy of techniques becomes questioned: if so many different techniques are used, how do we know if they work? Simply put, psyching up at its most minimal capacity can serve as a placebo. There are multiple distinct classifications of psych-up techniques depending on their mental or physical usage and whether

they have measurable physical effects or serve primarily as a placebo effect. Placebo effects are especially common because of the vast popularity of ritualistic tendencies experienced by athletes.

This is depicted in the article "Athletes' Perspectives of Preparation Strategies in Open-Skill Sports," written by Bonk and Tamminen (2021), in which 19 high-performance athletes were selected for interviews to explain their personal preferences and rituals. One athlete, an ultimate frisbee player, states that preparation is crucial, serving as "pregame mental checks... almost like a checklist that you have to get through to ensure you're in the right mental state going into a sporting event" (Bonk & Tamminen, 2021). A second frisbee athlete similarly describes their routine as checking off all the boxes so that there is nothing left in the mental white space but performance (Bonk & Tamminen, 2021). A clear representation of mental fortitude resulting from these strategies emerges and displays the perhaps sometimes unintended results of psyching up.

1.2 Factors of Success

Another crucial aspect of psych-up strategies is that consistency dramatically alters their success and impact. The article "A Practice-Specificity-Based Model of Arousal for Achieving Peak Performance," written by Movahedi and colleagues (2007), details this concept with a study of 37 male participants completing a series of tests involving the success of free-throw attempts. Participants were randomly assigned to either high-arousal or low-arousal performance conditions, determined by heart rate and the Sport Competition Anxiety Test (SCAT), using consistent techniques on a participant-by-participant basis. They performed 18 individual practice sessions, followed by a post-test session at a different level of arousal (Movahedi et al., 2007).

Interestingly, arousal level did not directly alter the success of free-throw attempts when it remained the same as during practice sessions. Even more notable was the discovery that the post-test session — in which athletes experienced a different level of arousal than during practice — showed a significant decrease in free throws made, attributable solely to the changed arousal variable. This confirmed that athletes most likely perform best when they utilize a similar arousal level to what they practice with, supporting the belief that consistency is key.

The article "Effects of Psyching-Up on Sprint Performance" details the broader benefit of these strategies by having athletes perform 30-meter sprints with 10-meter segmental measurements (Hammoudi-Nassib et al., 2017). Athletes improved their performance by 5.7% overall, with 14 out of 16 athletes significantly improving through positive self-talk and mental imagery. Hammoudi-Nassib and colleagues describe how a vivid and focused image produced muscle activation comparable to that observed in actual motion, demonstrating physical — not merely psychological — manifestation of the imagery.

1.3 Inverted-U and Catastrophe Theory

When studying psych-up techniques, it is necessary to detail the effects of arousal on optimal sports performance. While no universally accepted conclusion establishes the relationship between arousal and performance, the Inverted-U and Catastrophe theories are commonly accepted frameworks. The Inverted-U theory infers that as an athlete's arousal increases there will be a corresponding increase in performance until they reach a point known as optimum arousal; however, the arousal rate is not constant and will begin to deteriorate if it exceeds the optimal position (Gbadamosi, 2020). This relationship is illustrated in Figure 1.

An important factor to consider within the boundaries of the Inverted-U theory is the relative optimal arousal level each sport requires. Activities such as weightlifting or combat sports require a higher level of arousal than those of golf or archery, which require far more precision (Wells, n.d.). These sport-specific differences are illustrated in Figure 2, which details the different optimal arousal peaks across three representative sports. Golf, with a concentration-centered approach, occupies the lowest arousal threshold; boxing, with a combat-heavy focus, occupies the highest; and netball falls in the middle with a relatively moderate intensity. The article "Effects of Music on Arousal during Imagery in Elite Shooters: A Pilot Study" demonstrates this, as professional shooters rated unfamiliar relaxing music as their highest preference when performing imagery, followed by unfamiliar arousing music and familiar arousing music, in that order (Kuan et al., 2017). This supports the theory that lower-intensity sports require lower arousal levels to reach optimal performance.

Catastrophe theory offers an alternative explanation of the arousal-performance connection, illustrated in Figure 3. Similarly to the Inverted-U, it begins with increasing performance as arousal rises until reaching the singular point of best performance. The dramatic difference occurs when an athlete passes the optimal performance point, which prompts a significant and irreversible drop-off in performance as arousal continues to increase. Gbadamosi (2020) remarks that the deterioration would be more severe and cannot be addressed simply by calming down — the primary characteristic and source of the name for the Catastrophe Theory.

For example, the article "The Effects of Caffeine on Arousal, Response Time, Accuracy, and Performance in Division I Collegiate Fencers" examined the effects of caffeine on collegiate fencers. Certain amounts of caffeine did improve overall performance, but exceeding that threshold caused performance to deteriorate at a rapid rate — a practical portrayal of the Catastrophe Theory applied to high-level sport (Doyle et al., 2016).

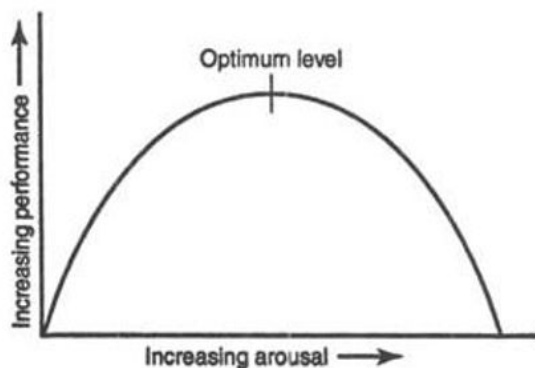


Figure 1: The Inverted-U Theory of Arousal and Performance TOG Soccer, *Applying the Inverted-U Theory to Soccer*; Depicts the theoretical relationship between increasing arousal and athletic performance, showing peak performance at the optimum arousal level. Performance deteriorates on both sides of the optimum. Adapted from TOG Soccer, Applying the Inverted U-Theory to Soccer (2015).

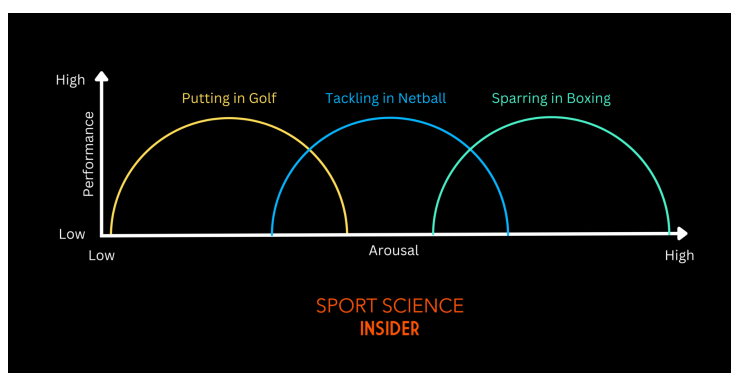


Figure 2: Sport-Specific Inverted-U Arousal Curves, Sport Science Insider, *Inverted U Theory Explained* Illustrates how the optimal arousal threshold varies by sport. Golf (putting) requires the lowest arousal, netball (tackling) requires moderate arousal, and boxing (sparring) requires the highest arousal for peak performance. Adapted from Sport Science Insider, Inverted U Theory Explained (Wells, n.d.).

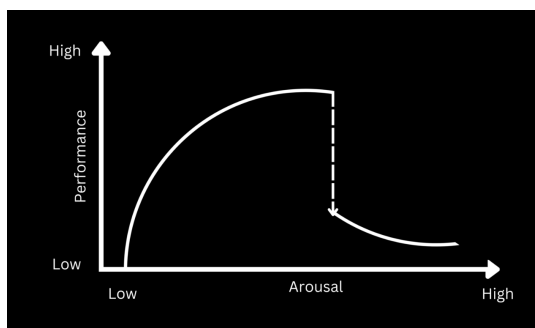


Figure 3: Catastrophe Theory of Arousal and Performance, Sport Science Insider, *Catastrophe Theory in Sport Explained* Illustrates the Catastrophe Theory's prediction that once arousal exceeds the optimal threshold, performance does not gradually decline (as in the Inverted-U) but instead drops sharply and irreversibly. This drop-off cannot be corrected simply by calming down. Adapted from Sport Science Insider, Catastrophe Theory in Sport Explained (Wells, n.d.).

2. Method

The chosen method used to accurately address the identified knowledge gap included two individual systems for gathering data. Each participant's responses identified primary characteristics regardless of the method of collection: age, sport or activity of choice, most commonly used method of psyching up, the reason why they partake in said method, and the physical response they feel following usage. These were universally needed for the statistical and qualitative analysis of both the prevalence of certain technique usage in specific sports and the broad categorization of motives behind usage. Before distributing the survey or conducting interviews, Institutional Review Board (IRB) approval was obtained to ensure the study met all ethical research guidelines involving human subjects.

2.1 Survey

The first chosen method was a survey containing a series of 10 individual questions as well as preliminary information gathering, distributed through in-school announcements, athletic programs, and their respective coaches. This survey group consisted of 195 students and collected unique information from a wide range of athletes across all sports offered at Aledo High School. The gathered data included: age, level of participation, sport, position/role, preferred psych-up technique, commonality of usage, effects on emotional state, effects on physical state, and choice reasoning. Each data set was individually consulted to identify patterns both within individual sports and across a variety of sports, such as sport intensity levels and the most commonly preferred method of psyching up.

2.2 Interviews

The second method consisted of 9 short, 10-question interviews with athletes of differing sports at varying levels of intensity. The interview method differed in its qualitative focus, which allowed for a far more in-depth analysis of interviewees' thoughts and beliefs. This qualitative information was then compared with the Inverted-U theory in order to understand the intensity of each sport and theorize how that impacted psych-up preference. After gathering data, quantitative survey data was compiled into a spreadsheet and cross-examined with qualitative data. A cross-analysis was also constructed between the findings of high school athletes versus the only known study groups of professional athletes.

3. Findings and Discussion

The process of data collection yielded a total of 195 high school athletes' survey responses spanning 30 sports, supplemented by 9 in-depth interviews across a variety of sports including basketball, baseball, football, golf, soccer, swimming, running, and volleyball. With a majority of survey respondents participating in varsity athletics (53.3%), the sample size was highly experienced in competitive play. Initial analysis confirms that psyching up is a key component in athlete preparedness, with respondents rating its importance an average of 4.05 out of 5. The most commonly used psych-up techniques reported were listening to aggressive music and physically participating in warm-up movements. However, a major divergence from preliminary research emerges when examining the emotional state of athletes and the intensity of their preferred techniques. While high-intensity techniques were relatively common, 60% of athletes identified "Relaxed Confidence" or "Calm and Focused" as their peak performance states, suggesting that high school athletes may prefer a lower intensity level than their professional counterparts.

3.1 Threshold Discoveries

Comparing these findings to the article "Competition-Day Preparation Strategies and Anticipatory Physiological Responses in Trained Strongmen Athletes" reveals an important distinction. Strongmen cited a high arousal threshold of 8 out of 10 as the upper echelon requirement for maximum force production (Winwood et al., 2019). When compared to high school athletes in this study who participated in gross motor skill sports (wrestling, football, weightlifting, track), the high school athletes preferred lower intensity by approximately three points. The average gross motor athlete from the interview series rated their optimal intensity as 5.1 out of 10, with the football player preferring a 4 out of 10, stating that when his arousal surpasses that threshold he begins to "forget assignments." A surveyed wrestler noted that "in wrestling, the more controlled aggression you have, the more it helps."

Table 1 presents the optimal intensity thresholds and peak mental states for each sport with a corresponding interview, with the strongmen category serving as a professional baseline.

Sport / Category	Optimal Intensity (1–10)	Reported Peak Mental State
Strongmen (baseline)	8.0	Maximum Aggression / Force
Soccer	7.0	"Chaotic and Aggressive"
Volleyball	6.0	"Positive Intensity"
Basketball	4.5	"Serious and Decisive"
Football	4.0	"Controlled / Remembering Plays"
Long Distance Running	4.0	"Peaceful and Detached"
Golf	3.5	"Chill / Normal Habits"
Baseball	2.5	"Zen / Zoned Down"
Swimming (Technical)	2.5	"Analytical / Sharp Vision"

Table 1: Optimal Arousal Threshold and Peak Mental States by Sport Intensity ratings derive from interview self-reports and survey cross-analysis. Strongmen data sourced from Winwood et al. (2019) and used as a professional baseline.

Generally, these sports can be categorized into three groups based on skill type: variable (gross), complex (gross), and precision (fine). Variable sports occupy intensity levels between 6–7, such as soccer and volleyball, which require high cardio to stay quick and alert. Complex sports fall between 4–5 intensity levels, consisting of sports such as football and basketball, requiring high energy but also accurate decision-making. Precision sports occupy intensity levels between 2.5–3.5, such as baseball, golf, and swimming, which have high technicality that excessive arousal can damage through uncontrolled movement or tension.

3.2 The Catastrophe Point

Another important finding concerns the applicability of the Catastrophe Theory to high school athletes. Out of the 195 athletes surveyed, 52 (approximately 27%) explicitly stated that their techniques had become too intense and led to harm. The basketball player interviewed stated that being overly energized causes him to "overthink and force things." The football player similarly stated that being too worked up causes him to "forget assignments," and the swimmer described a "snowball effect" that causes a sudden mindset flip.

The soccer player interviewed described a "stacking phenomenon" in which a high-intensity mistake leads to frantic attempts at remedying the situation, ultimately causing a severe downturn in performance. His "chaotic and aggressive" preferred mindset is characteristic of high arousal, yet his "rushing" is the exact thing that leads to catastrophic failure. Compiling these specific interview instances with the 27% of respondents who regularly experience backfire from their techniques and comparing them to the abrupt performance drop described under the Catastrophe Theory (Gbadamosi, 2020), a large number of athletes demonstrably experience a pattern characteristic of the Catastrophe Theory. This shows that high school athletes often choose techniques with too much intensity that result in harm.

3.3 Psych-Up Misalignment

A vital finding is the misalignment of athletes' chosen psych-up method with their optimal arousal level. There is a particular "aggressive music paradox" prominently seen across all sports, in which athletes attempt to prepare for relatively low-arousal activities — involving precision or endurance — with high-arousal tools such as aggressive music or stimulants. The interviewed runner stated that using intense music "didn't consistently improve performance" because it created a level of "hype" that differed from the natural adrenaline needed to sustain a long race, often causing burnout. Out of the 18 survey respondents who identified their main sport as track and field or cross country, 12 reported using aggressive music or physical intensity as their primary psych-up method, citing their post-psych-up emotion as "excited" or "aggressive." This directly contradicts the 61% of those same runners who identified "relaxed confidence" or "calm and focused" as their optimal state.

Table 2 presents each psych-up technique category correlated with a specific intensity level, derived from the preliminary research and qualitative data.

Strategy Category	Tool Example	Target Intensity (1–10)	Performance Goal
Ergogenic Aids	Caffeine / Smelling Salts	8.0–9.0	Maximum Force / Speed
Psychological Hype	Aggressive Music / Yelling	7.0–8.0	Adrenaline / Intimidation
Social Reinforcement	Team Hype / Crowd Energy	5.0–6.0	Motivation / Momentum
Cognitive Anchoring	Positive Self-Talk / Rituals	4.0–5.0	Confidence / Assignment Focus
Physiological Calming	Breathing / Zen Music	1.0–3.0	Fine Motor Control / Precision

Table 2: Psych-Up Strategy Categories and Their Corresponding Arousal Intensity Intensity levels were derived from cross-analysis of preliminary research and interview data. Categories are generalized and may overlap depending on individual athlete application.

Correlating the optimal arousal level of each sport with the arousal levels of each technique, conclusions can be drawn about the optimization of psych-up techniques by sport. Basketball and volleyball are among the most effective at utilizing scientifically beneficial techniques to reach a moderate arousal state between levels 4–6. Volleyball leans heavily on positive self-talk (26.7%), which falls closely within its arousal range, and basketball relies on visualization (26.3%), also falling closely within its range. Table 3 presents the technique accuracy rate and most common method used for each sport in the study.

Sport	Accuracy (%)	Most Common Method Used
Weightlifting	70.0%	Aggressive Music + Stimulants
Basketball	60.0%	Aggressive Music + Physical Warmup
Volleyball	53.3%	Positive Self-Talk + Physical Warmup
Football	44.4%	Aggressive Music + Stimulants
Soccer	43.5%	Aggressive Music + Stimulants
Baseball/Softball	41.9%	Visualization + Physical Warmup
Track & Cross Country	33.3%	Aggressive Music + Physical Warmup
Golf	33.3%	Visualization + Physical Warmup
Swimming	25.0%	Aggressive Music + Physical Warmup

Table 3: Technique Accuracy Rate and Most Common Psych-Up Method by Sport Accuracy is defined as the percentage of athletes in each sport whose chosen method matches the reported optimal arousal state. Only the most statistically significant sports from the survey were included.

Out of these nine sports, only three had above a 50% accuracy rating, meaning the vast majority exhibit major misalignment. The total sample population reported a 27% backfire rate from their techniques overall. Therefore, only a third of the majorly responsive sports demonstrated a somewhat viable technique-to-optimization ratio.

3.4 Limitations

While this study provides valuable insight into the psych-up techniques of high school athletes and their accuracy with regard to optimal arousal levels, it contains several limitations. First, while this study is statistically significant at the overall level of total respondents, the variety of sports creates a lack of certainty for each individual activity. The most responsive sports were included to minimize this concern. Second, the study incorporates qualitative questioning that required responses to be generalized into smaller categories, potentially disregarding personal and more detailed responses. Lastly, while this study addresses the scientific accuracy of what should be the optimal arousal for each sport, this is an inherently subjective metric. There will always be outliers that differ from the majority and cannot be properly accounted for.

3.5 Implications

The primary implications of this study emerge in the field of practice. The information provided on the misalignment of optimization techniques could be used by high school athletes to better understand how they could improve their performance with minimal effort. Simple changes to preparation can prevent catastrophic performance drops and stabilize energy levels, as illustrated through the tables and figures provided in this study.

Furthermore, this study has scientific implications and could encourage further research. New studies could emerge that focus on a single sport individually to create a more statistically viable finding for a larger population of athletes. Scientific knowledge could also benefit from further research on the practical implications of Catastrophe Theory, as this data implies inaccuracies are prevalent in over 66% of sports, with catastrophes happening in approximately one in four athletes.

4. Conclusion

This study was intended to provide further information on the reasoning behind high school athletes' chosen methods of psyching up for their sports of choice. Through a mixed-method data analysis, it is feasible to conclude that high school athletes tend to associate high levels of energy with success more often than not, despite this not being scientifically viable when considering the arousal level correlated with techniques such as stimulants or aggressive music. This indicates that athletes primarily choose their psych-up technique not due to performance boosts but instead because of what can be considered superstition or ritual. The literature review is similar in theme, with repeated use of ritualistic or superstitious tendencies, often explained by a "checklist" or "pre-effort routines" (Fronso et al., 2017).

When revisiting the hypothesis, it is clear that a general assumption of a positive correlation between sport intensity and preparation intensity is far from accurate. Chosen

techniques were seemingly unpredictable and should be streamlined for better performance. Future research may hone in on one specific sport, which allows for easier comparisons with the generalized data to uncover underlying themes of inaccuracy. Overall, this study provides new insights into the field of athletic preparation for high school athletes and should be considered for enhancing performance in practice and for future research endeavors. Psyching up is a lesser-known tool that, with the right implementation, can be utilized to bring players to their peak performance.

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