A META-ANALYSIS ON LONELINESS IN RELATION TO ACADEMIC ACHIEVEMENT AND ENGAGEMENT IN ADOLESCENCE

by

MORGAN MUNOZ
(Under the Direction of Noel Card)

ABSTRACT

Research on loneliness has often been neglected in social development literature but now takes precedence. Adolescents, specifically, are linked to the school environment, which coincides with significant social and biological changes that are occurring. In this meta-analysis twenty-three studies were included focusing on loneliness and critical educational outcomes such as academic achievement and engagement in adolescence (12-17 years old). The analysis included 18,486 participants and revealed a significant negative effect on loneliness and achievement (r = -0.08). Loneliness was also found to have a significant negative effect alongside academic engagement (r = -0.25). Moderator analyses were conducted exploring regional and measurement variations. In a world where social connection has become an increasingly critical issue, the findings of this meta-analysis aim to underscore the importance of studying adolescents in an academic context. With findings valuable for parents and educators, we speak on limitations and further literature enhancement in the discussion.

INDEX WORDS: *loneliness, academic achievement, academic engagement, adolescence.*

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Introduction

A META-ANALYSIS ON LONELINESS IN RELATION TO ACADEMIC ACHIEVEMENT AND ENGAGEMENT IN ADOLESCENCE

Recovering from such a widespread pandemic, it is no surprise that loneliness is on the rise in our world. Recently, loneliness and isolation have been named an epidemic in our nation by the US Surgeon General (Murthy, 2023). According to Weiss, "loneliness is a reaction" to the absence of meaningful connections that align with the individual's necessary ideals. (Weiss, pp. 36-37, 1975). Loneliness is a subjective perspective of how an individual perceives their social relationships and the belief that it is not meeting a basic need or expectation (Heinrich & Gullone, 2006). This contrasts with social isolation, which refers to lacking social contact (Kraav et al., 2021). Though a needed research topic in our field, loneliness still lacks the attention it deserves because of varying definitions and the lumping of current terms (i.e., social isolation, social withdrawal, rejected individuals).

Most studies examine academic achievement in relation to parenting styles, socioeconomic status (SES), and/or home environment. (Fan & Chen, 2001; White, 1982). Similar to social skills, academic skills, if not learned early on, can have implications for items such as attention deficit and lack of social competence (Rabiner et al., 2016). Deciding where teachers and policymakers should focus curriculum and what individuals are in danger of is vital to giving every student the same opportunity. Ladd's (1999) review focuses on the importance of social friendship and having social contacts, even mentioning its contribution to academic competence and adjustment in a school setting. Observations indicate that children facing rejection exhibit lower school

adjustment, even when controlling for other factors. (Buhs & Ladd, 2001). These findings aid to underscore the impact of loneliness on a child's overall academic experience in adolescence.

Loneliness

To comprehend loneliness, we as researchers must first understand the individuals at hand; we often look at neglected, rejected, and unpopular individuals. One must also recognize its division into social and emotional loneliness that is shown in literature. There is controversy in our field on measuring the 'core' of loneliness and separating the various types or if there should be different types. One of these separations is between social and emotional loneliness (Weiss, 1974, 1975). Weiss argues that social loneliness is more connected to the lack of active and ongoing social networks, whereas emotional loneliness is the lack of an intense attachment to another individual (Weiss, 1974, 1975). The term social isolation is often used interchangeably with loneliness, and although it captures part of it in some ways, it does not get at the entire picture. Looking at various social isolation measures, items commonly used to measure isolation tend to include questions regarding the number of social contacts an individual has rather than questions about the overall quality of those relationships (Lubben et al., 2006).

Loneliness is contingent on an individual's emotions or responses and thus subjective, as highlighted by Weiss; it is inherent in human nature. (Weiss, 1975). Perceived loneliness contributes to significant health effects and can occur in many individuals, from adolescents to elders (Campagne, 2019). Perception is almost more significant than the truth of the reality that an individual is living (Clarkson et al., 2010).

Perception is included in the Family Systems Theory through the ABCX model as a portion, noting the importance of the family's *perception* of a stressor (Hill, 1958). Not adjusting to one's self-concept of how they are can be very harmful to how they perceive their social surroundings. Goswick and Jones (1981) conducted an empirical study looking at the overall relationship between loneliness and how positive or negative one would score on a self-concept scale, as well as overall adjustment and self-image. An increase in loneliness showed a negative relationship in all three variables, showing the importance of this *perception* of loneliness (Goswick & Jones, 1981).

People of all races, genders, and ethnicities experience loneliness; loneliness is common (Hawkley & Cacioppo, 2010). It is so common that about 80% of individuals, before even reaching the age of 18 and entering the stage of emerging adulthood, feel or have felt lonely (Hawkley & Cacioppo, p.218, 2010). Research suggests that transitional periods for individuals can cause increases in anxiety and adverse outcomes. Rosenstreich and Margalit (2015) found that college-aged students experiencing the transition period from high school to college had higher rates of loneliness and poorer academic achievement. Though studies have continued to find negative links between depression and varying mental health outcomes to academic variables, much less is known about the connection of these constructs concerning adolescence (Mistry et al., 2009).

Adolescence

Adolescence is often classified as a sensitive period in an individual's life (Sisk & Gee, 2022). Researchers have additionally emphasized that loneliness is more prevalent within this particular age group.(Lempinen et al., 2018; Barreto et al., 2021).

Concurrently, while youth undergo biological changes, social changes are also occurring. Social changes, such as the natural shift from parental-dominated to peer-dominated relationships, are usually seen during this time (Dijkstra & Veenstra, 2011). However, there is a transition to this: Adolescents may perceive increased loneliness when distancing themselves from parents while establishing new, incompletely formed bonds with friends (Goosens, 2018). Farrell and colleagues discuss the importance of building social relationships during childhood and adolescence in order to maintain positive mental health outcomes (Farrell et al., 2023). During adolescence, biological changes, including pubertal development, can impact stress reactivity. (Hang et al., 2023). Dahl and colleagues posit, alongside other research, that an individual's stress response can impact their social behavior or action, thus contributing to increased withdrawal (Dahl et al., 2018).

Peer relationships can contribute to many later life behaviors and actions, particularly those relationships formed from adolescence. Friendships during this developmental stage provide comfort and support during the transition from early childhood into adolescence. The benefits of this type of peer social support are immeasurable to an individual's developmental trajectory throughout the lifespan and can act as protective factors in one's development (Abdulhamed et al., 2022; Yan et al., 2022). A protective factor is a characteristic, perception, attribute, or condition that positively impacts the individual.

Peer influence is essential for growth and holds relevance in developmental theories, such as the social learning theory (Bandura, 1977). Individuals, particularly adolescents, can learn a vast amount from their surroundings. By observing or even

imitating others in one's peer group, individuals can shift their overall behavior to be more similar or different. Reinforcement is a part of the social learning theory that takes ownership of this area; interactions and behaviors that elicit a positive response from one's peers are much more likely to be repeated and increase in the frequency they occur (Bandura, 1977). Similarly, one can interpret this in a negative light; eliciting a negative response could and would likely cut out that behavior entirely. Being part of a group can help individuals to fit into more settings. If an individual sees that a particular behavior works for someone whose status they desire, they will more likely than not try to implement that same behavior. In terms of loneliness, depending on the duration, being without those interactions can be detrimental to later development. Reteaching the social skills gained from peer interactions to these individuals who have gone through a form of loneliness is vital in moving forward and experiencing positive social interactions.

Although adolescence is a time for social interaction and development, this is also a period of intellectual growth (Andrich & Styles, 1994). Being in a positive environment that can help foster cognitive development is critical for youth as they move forward into adulthood. Porter and colleagues (2022) conducted a study looking at possible intervention methods for adolescents in a schooling system regarding their academic achievement via mindset goals. The study found that increased support from teachers implementing a *growth mindset* allowed students to flourish academically (Porter et al., 2022). What occurs during adolescence in regard to academic identity can have a profound effect on future orientation in later adulthood, thus making academics a crucial outcome to study for this age range (Pop et al., 2016).

Adverse Outcomes

As posed by the US Surgeon General, loneliness and isolation are significant issues that, without being dealt with, can be very deadly (Murthy, 2023). Studies have shown that an increase in loneliness and isolation can lead to a multitude of adverse health outcomes, one even being early life death (Holt-Lunstad et al., 2015). A decrease in quality of life and warding off of happiness seem to rise alongside loneliness compared to individuals who desire to be alone (Campagne, 2019). Similarly, there are implications that a lack of social connection can have for an individual's cardiovascular health, noting that individuals lacking any connections are at a much higher risk of having heart disease (Holt-Lunstad, 2021). Loneliness is on the rise for adolescents and is a critical time for a directional shift in relations. This can lead down various paths, including aggression, anxiety, and victimization. However, these paths go through different biological, psychological, and behavioral aspects to end with many possible unwanted outcomes (Holt-Lunstad, 2021).

Adverse outcomes in psychopathology seem to emerge in adolescence at higher rates. Because of the increased tasks and responsibilities that occur during the adolescent years (e.g., increased curriculum, social change, pubertal change, etc.), youth can find themselves feeling inadequate in some of these areas (Cicchetti & Rogosch, 2002). In adolescence, youth are at a heightened risk for suicidality (Itzhaky et al., 2022). Recognizing the early signs of distress and anxiety in youth to implement interventions could play a critical role in promoting adolescent well-being, making it imperative to warrant a holistic approach combining social, educational, and mental health support outlets for youth.

With the isolation of online school and lack of interaction with peers of similar ages because of the COVID-19 pandemic in 2020, there have been extensive ramifications for youth who were affected (Ernst et al., 2022). Since the pandemic, this push to understand topics like loneliness and depression has been at the forefront of research (Ernst et al., 2022; Loades et al., 2020). It is no surprise that in the context of a classroom setting, researchers have questioned this dynamic. Can this *perception* that adolescents have of their own social contacts affect their ability to thrive academically?

One can measure academic achievement and success in various contexts, depending on the desired outcome. A few are an individual's grade point average (GPA), attendance, and overall engagement in a school setting. The significance of engaging with peers to exchange ideas and collaborate, whether in pairs or groups, has been demonstrated to yield academic advantages and foster positive behavioral outcomes (Winne & Nesbit, 2010). A positive social community can help individuals feel as though they belong (Szreter, 2004). Similar to reinforcement behavior, more positive social interactions will increase the positivity an individual experiences; in the same way, negative social interactions will increase negative experiences.

Information exchange allows for peer influence in an individual's life. Being able to share knowledge about academic topics can increase overall learning. Having peers to share knowledge with is crucial in a classroom setting (Bukowski et al., 2019). As with most concepts in development, this can have adverse effects; it can go in either a positive or negative direction. If the peers affirm a negative opinion about something in the school system, this can increase negative behavior. However, overall findings show that any relationship is still more beneficial than being without one. Multiple findings show the

importance of having positive peer relationships and how those can significantly change academic adjustment to school (Vandell & Hembree, 1994; Molloy et al., 2011).

Theoretical Backing

Loneliness can be further explained and understood through a phenomenologist viewpoint; this perspective considers an individual's past experience to dictate their future actions (Salder et al., 1978). For example, after being shut down, rejected individuals would likely not engage again, fearing further rejection. Through behavioral inhibition, individuals can become weary or uneasy in new social settings and stop engaging in social activities altogether (Bukowski et al., 2019). As with most individuals who avoid social interactions and decrease exposure to new surroundings, they may further increase the likelihood of being rejected by peers. By not wanting to be present for specific situations or social interactions, individuals are missing out on significant exposures and changes that can occur at different developmental stages, especially in a younger age of transition. It is vital to study loneliness at a young age to better correct these social interactions that will occur during development and outcomes such as academic achievement to validate the importance of these studies.

Bronfenbrenner's ecological model can be applied to this study to better understand an individual's environment and factors contributing to their overall well-being (Bronfenbrenner, 1994). The ecological model breaks down into various systems: the microsystem, mesosystem, exosystem, macrosystem, and chronosystem; there are positives and negatives alongside this, each affecting the individual differently (Bronfenbrenner, 1994). The microsystem, being the first section of the model, is the section that interacts with the individual on a daily basis. This section fits closely with an

individual's academic and school presence. This model incorporates an individual's academic achievement and school setting due to their significance and commonality for individuals, especially adolescents. Children spend most of their day in school and will continue until about 18 if they decide not to further their education. The types of connections made in academics, developmentally or socially, are exceedingly important to the individual to whom they are attached. Bronfenbrenner's ecological model emphasizes a holistic perspective on individuals rather than an atomistic approach across the various systems with which they are intertwined. (Bronfenbrenner, 1994).

Sociometric Scales

Asher and Wheeler have been incredibly influential on how we think about loneliness for children in particular. Asher and colleagues started by creating a scale to assess the loneliness of children using sociometric measures (Asher et al., 1984). Social cognitive mapping is vital to understanding the inner workings of a peer group (Cairns et al., 1985). As a researcher, one can compare the differences in what an individual thinks of themselves and what others think of them. Noting any group's dyadic and peer social preferences can have massive implications, especially in a schooling system. The main question Asher and colleagues' (1984) study sought to answer was the correlation between peer-nominated unpopular or children with low acceptance numbers and how much the individuals reported feeling lonely. There was a statistically significant difference in highly unpopular children reporting feeling lonely compared to the opposite end of the spectrum with individuals who were peer-nominated as popular (Asher et al., 1984).

Asher and Wheeler's (1984) work brought the initial interest in understanding loneliness further and a need in our field to measure it effectively, being of the utmost importance. Just as there are different depression scales, some being more valid for specific age groups, this should be a common practice for loneliness measures as well. The importance of including accuracy in what specific scales in the loneliness and isolation field are measuring is a controversial discussion. Asher and colleagues saw this need for separating measures by the age group they described, thus creating a few different measures throughout their careers (Asher et al., 1984).

Research Questions

The purpose of this study was to identify the relationship between loneliness and various academic variables in adolescence and look for possible moderators that could contribute to this relationship through a search of current literature using a type of quantitative review called meta-analysis. A meta-analysis of studies conducted on loneliness in relation to academic variables to date would prove beneficial for our field beyond the pandemic's aftermath. By acknowledging the limitations, we can establish a more comprehensive foundation for moving forward. Despite conducting meta-analyses on loneliness in general and varying outcome variables, researchers have not yet examined it through the academic variables addressed in this study.

While not initially included in the research objectives for this study, looking deeper into the possible moderation occurring within the type of loneliness scale employed per study was considered. Several moderator variables were coded in conjunction with loneliness and the academic variables (i.e., academic achievement

(GPA), academic engagement, academic attendance), these being the region where the study took place, the types of scales used for each variable, and the percent male. Although a common outcome looked at when studying loneliness in current research is depression, number of social contacts, or media influence, the importance of keeping the study academically centered was at the forefront.

I hypothesized that there would be a negative relationship between loneliness and all academic variables coded for (i.e., academic achievement (GPA), academic engagement, and academic attendance) in the adolescent age range. I expected the magnitudes of effects would differ; however, having a more substantial magnitude with loneliness and academic engagement than any other two variables. Logistically speaking, individuals who lack social connections would not necessarily engage in social interactions with other peers in a school setting, no matter the comfort or familiarity of the environment.

Incorporating the additional academic variables examined in this study (i.e., academic achievement and academic attendance), though hypothesized that the greater the students report feeling lonely, the more likely they will have a lower GPA and lower school attendance, I expect the magnitude of the effect sizes for these connections will be much smaller than that of loneliness and academic engagement. For academic achievement coded through the student's GPA, there could be possible scale measurement error in not calculating for individuals who desire to be alone rather than being lonely and wanting connection. The potential presence of measurement error might be a factor in the absence of a statistically significant impact on academic achievement and loneliness outcomes. Since the participants in this study are adolescents with a mean

age falling between 12 and 17 years, most students will not yet have a driver's license, thus contributing to their attendance, which would be based on parental driving. Parental information not being reported in most studies, including academic attendance, could contribute to the lack of evidence to support the claim of loneliness predicting academic attendance in a school setting. Thus, I excluded attendance.

Research Goals

1. Understand the relationship between loneliness and academic achievement and engagement in adolescent samples.
2. Examine studies on loneliness and academic variables for signs of publication bias.
3. Conduct moderation analysis to explore whether variations in the prevalence of loneliness and the relationship with included academic outcomes (i.e. academic achievement and academic engagement) can be attributed to the study's location or the scale/measurement employed.

Method

Selection of Studies

I obtained studies from two online databases: PsycINFO and ProQuest. Search terms included ("loneliness") AND ("academic achievement" OR "academic success" OR "academic engagement") AND ("adolesc*"). The initial search produced 94 studies that we further examined based on inclusion and exclusion criteria. To be included in this meta-analysis, the studies fulfilled the specified criteria: (a) loneliness reported; (b) the

sample consisted of adolescents with a mean age between 12-17 years; (c) the sample was normative (e.g. no retrospective accounts, autism studies included); (d) the studies were in English and were accessible; (e) not qualitative, only empirical/ quantitative studies; (f) an academic variable was reported (i.g. academic achievement, academic engagement). Following a brief review of titles and abstracts from the initial search results, we selected a more focused subset to proceed with. We closely examined the methods and results section within the selected subset to confirm inclusion in this meta-analysis. See Figure 1 for the PRISMA diagram outlining the different stages of study selection for the final analysis.

Coding of Studies

We recorded the document type for each study analyzed in this meta-analysis to evaluate the potential publication bias in the effect sizes of published and unpublished articles. We qualitatively noted how each study was implemented in the initial coding sheet, keeping track of reasons for inclusion or exclusion. Demographic and measurement variables were also included in the coding section as follows: (a) the region in which the study took place, (b) qualitative sample characteristics, noting if the sample was split by grades or by the season in which the data was collected, (c) the sample size, (d) the percent male in each sample, (e) the academic achievement measure, (f) the academic achievement Cronbach's alpha, (g) the academic engagement measure, (h) the academic engagement Cronbach's alpha, (i) the loneliness measure, (j) the loneliness Cronbach's alpha, (k) the correlation coefficient of loneliness and academic achievement, (l) the correlation coefficient of loneliness and academic engagement.

Results

After conducting an initial search of 97 sources and applying a multitude of exclusion and inclusion criteria, we identified 23 studies that met the requirements for extracting accurate data. Of the 23 studies, 18,486 participants were included in the analysis, with 50 different effect sizes amongst loneliness and academic outcomes included. As outlined in Figure 1, 28 authors were contacted for the purposes of their data to be included in the analyses; however, only two authors responded. Pending an individual study included multiple effect sizes (e.g. separated by term, subject, academic achievement and academic engagement), all effects were coded separately in the dataset.

Loneliness and Academic Outcomes

The analysis of the results involved using the R software version 4.2.1 (R Core Team, 2023), with a specific focus on the 'psych' and 'metafor' packages (William, 2024; Viechtbauer, 2010). The random effects model, employing restricted maximum likelihood, was used to compute the overall effect size for loneliness in relation to the academic outcomes included in this study. The calculated effect size for the association between loneliness and academic achievement was [r = -0.08, 95% CI = -0.13 to -0.04 , p < 0.01], indicating a statistically significant but small magnitude negative effect by Cohen's standards (Becker, 2000). Notably, considerable heterogeneity was observed through the studies included, as evidenced by a significant Q(22) = 128.16, p < 0.0001, and an I^2 value of 86% . Similarly, this study employed a random effects model using restricted maximum likelihood to compute the relationship between loneliness and academic engagement. The calculated effect size for the association between loneliness

and academic engagement was [r = -0.25, 95% CI = -0.31 to -0.18, $p < 0.001$], indicating a small but statistically significant negative effect by Cohen's standards (Becker, 2000). Heterogeneity was also found within academic engagement and loneliness as evidenced by a significant Q(12) = 76.32, $p < 0.0001$, and an I^2 value of 88.01% with a significance level of $p < 0.0001$: These results suggest substantial heterogeneity among the studies included; however, the effect remains significant.

Moderator Analysis

Individual sample characteristics (i.e., mean age), region location, and measurement variables were considered for possible moderators affecting the relationship between loneliness and the academic outcomes included in this study. Regarding the region location as a moderating variable, a mixed-effects meta-regression model was employed to account for the heterogeneity of this relationship. In examining the moderating influence of study location on the relationship between loneliness and academic achievement, the United States was employed as the reference in contrast to various other countries investigated in the studies, including China, Germany, India, Turkey, and the United Kingdom. The countries of India and Turkey were found to be statistically significant moderators on the correlation between loneliness and academic achievement (B = 0.29, $p < 0.0006$; B = -0.28, $p < 0.0007$). Suggesting that there are significant differences in a positive direction for effect sizes collected in India compared to that of the United States (B = -0.45). In regard to Turkey, the effect sizes collected compared to that of the reference country of the United States are lower, suggesting that samples in Turkey show a significant difference in a negative direction for the dependent variable of academic achievement. Comparatively to that of the United States, China also

had a significant moderating effect positively on the dependent variable of academic achievement (B = -0.15, $p < 0.05$). As previously stated, the region's moderator was also used regarding the relationship between loneliness and academic engagement. The study that included a nationally representative sample was statistically significant in moderating the correlation between loneliness and academic engagement (B = -0.36, $p < 0.05$), suggesting significant differences in a negative direction for effect sizes collected in this study compared to that of the United States. The intercept, which indicates the average response variable (i.e., academic engagement) is different from zero when all other variables are compared to the reference (i.e., United States), was found to be highly significant (B = -0.29, $p < 0.001$).

The measurement type for loneliness was also considered as a possible moderator on the correlation between loneliness and academic achievement. Over 60% of the studies included in the analysis used The Loneliness Scale created by Asher and Wheeler in 1985 and thus was used as the reference for the moderation. A singular study used the Emotional and Social Loneliness Scale created by Gierveld and Tilburg in 2006. The Emotional and Social Loneliness Scale showed a significant result at $p < 0.01$ in reference to the Asher and Wheeler Scale created in 1985. All other scales used to assess loneliness (i.e., UCLA Loneliness Scale, Children's Loneliness and Social Dissatisfaction Scale, as well as the Hebrew adaptation) were not found to be significant moderators in the relationship between loneliness and academic achievement.

Publication Bias

Document type was considered when coding to further evaluate publication bias in the studies collected specific to loneliness and academic achievement; no indication of publication bias was detected through a mixed-effects model (B = 0.07, $p = 0.31$). As can be seen in Figure 2, the funnel plots indicated a symmetric distribution. Given the nonsignificant results of publication status predicting effect size and the symmetry of the funnel plot, I conclude that there is no evidence of publication bias in these results.

Discussion

In regard to the research objectives targeted by this meta-analysis, I identified substantial adverse findings in the relationship between loneliness and the analyzed academic outcomes, specifically academic achievement and engagement. In older samples researching increased loneliness and poorer academic outcomes, looking for possible mediators to this, Rosenstreich and Margalit found a connection to increased loneliness and poorer academic achievement at the university level (2015). However, our research found a similar significant negative effect size between loneliness and academic achievement in the adolescent age range. This means that students with increased loneliness often experience lower academic achievement in their school concurrently (typically defined with a lower grade point average).

Similar to academic engagement, research has focused on older samples and/or differing measures of loneliness (e.g., work loneliness, friendship measures, brief assessments). However, our analysis showed a small but significant negative effect between loneliness and academic engagement in the adolescent age range. This means

that when loneliness is high, adolescents tend not to engage in school as highly as students with lower loneliness. A study by Singh and colleagues further confirms this negative link between loneliness and academic engagement (2021).

In addressing the moderation analyses performed in this paper, the locations of the individual studies and the specific scales assessing loneliness were observed and evaluated. Literature on the moderating effect of the region with regard to the relationship between loneliness and academic outcomes is scarce. This meta-analysis did have significant moderating effects for three regions in reference to the United States samples for academic achievement. The samples in which the individual study took place in China and India showed a positive significant moderating effect on loneliness and academic achievement. However, studies conducted in Turkey included in the analysis had a negative moderating effect on loneliness and academic achievement that was statistically significant. On the variables loneliness and academic engagement, the only study that included a moderation effect as significant was that of the nationally representative sample compared to the United States concerning the relationship between loneliness and academic engagement.

Limitations

Although this meta-analytic review has made valuable contributions, the findings have certain limitations. One limitation inherent in any meta-analysis is that the available data constrains researchers (Card, 2015). Another limitation of the analysis was the need for more literature focused on academic outcomes. In many of the studies included in the analysis, academic achievement was never at the forefront of the "research question;"

instead, it was added by a report of GPA single-item responses. Expanding on this connection to academic achievement could be beneficial in explaining any variance we see in the literature more accurately. How loneliness is measured was also an unexpected challenge brought into the mix when coding. For example, authors originally wanted to include social and emotional loneliness measures separately, but the field lacked the literature to do so. Furthermore, psychometric researchers have pointed out the inclusion of measures that seem to be unfit for adolescents that are still commonly used; particularly in this study, measures encompassed the UCLA Loneliness Scale and Children's Loneliness and Social Dissatisfaction Scale, which were both standard measures included in many of the papers (Maes et al., 2022; Cole et al., 2021). However, I compared the UCLA Loneliness and Children's Loneliness and Social Dissatisfaction Scale with all other scales used to look into the possibility of moderating effects on loneliness and academic achievement. I found no significant differences in the relationship.

Implications

The findings of the analysis reveal that the relationship between loneliness and adverse academic outcomes is a prevalent issue in the adolescent age range. Studies have shown the importance of understanding loneliness, especially in adolescence, as it seems to be one of the most prominent times to experience it in an individual's life (Lempinen et al., 2018; Barreto et al., 2021). The need to promote holistic student development could have implications based on the results of this study. If not addressed appropriately, loneliness could contribute to increased adverse academic outcomes, thus highlighting the urgency of implementing strategies and environments in which the adolescent can be

supported and included. Adding a holistic approach may allow a world in which researchers encompass the supportive academic environment and social and emotional well-being, playing a pivotal role in youth development.

Undoubtedly, when including an academic outcome, the analysis results could have implications for teachers, school administrators, and policymakers for districts. Jefferson and colleagues suggest that creating a safe student environment can act as an intervention (2023). However, teachers play a central role in facilitating interventions such as this. Having the ability to grasp potential risk factors for loneliness, such as low socioeconomic status (SES) and being a minoritized child, is crucial for bridging the gap between ongoing research and the practical implementation needed to endorse this change in classrooms. A randomized trial conducted in England by Hennessey and colleagues implemented the effects that school-based interventions (specifically Promoting Alternative Thinking Strategies (PATH)) can have on social and emotional learning at the classroom level (2021). Results suggest a positive effect of the intervention on youth's loneliness in the sample; moving toward more classroom-based interventions rather than suggesting entire policy changes may be the best way to integrate this knowledge into schools (Hennessey et al., 2021).

Conclusion

Loneliness is a critical issue that plagues today's youth. Researchers tend to focus through the lens of mental health outcomes discussed heavily in literature (Wang et al., 2018; Richardson et al., 2017; Loades et al., 2020). Through its growing importance, especially for youth, loneliness is receiving more attention, especially in the media, post-

COVID-19. However, concerning academic outcomes, loneliness is not at the forefront; many studies included and not included in the analysis answered different questions entirely, not necessarily looking for the relationship between loneliness and an academic outcome. This analysis aimed to bridge gaps in the existing literature, fostering a comprehensive understanding of the two constructs, namely loneliness and academic outcomes. The objective is to offer support and direction for researchers, policymakers, and teachers, enabling them to approach future endeavors with a holistic perspective.

Figures

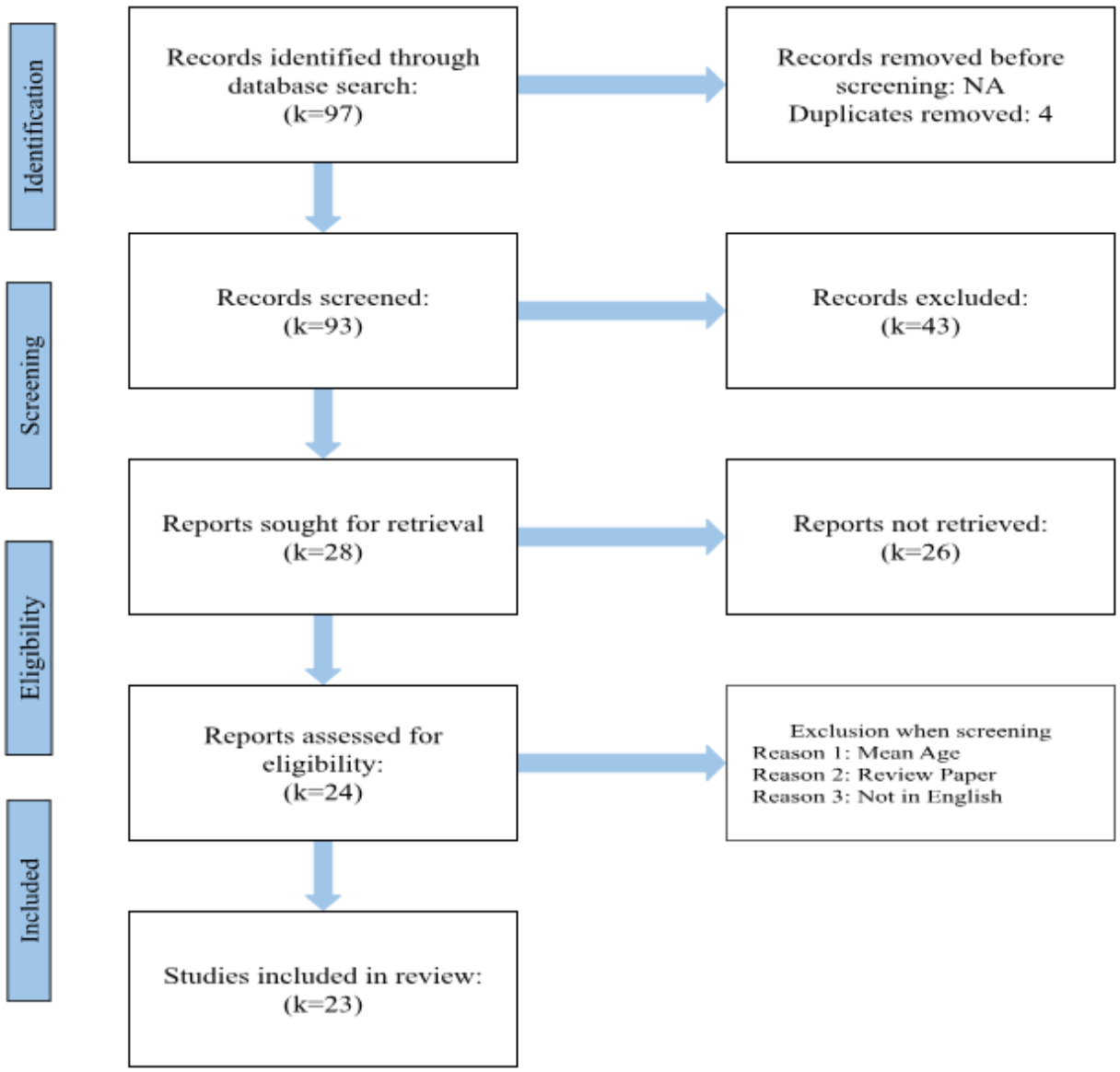

Figure 1: PRISMA Diagram

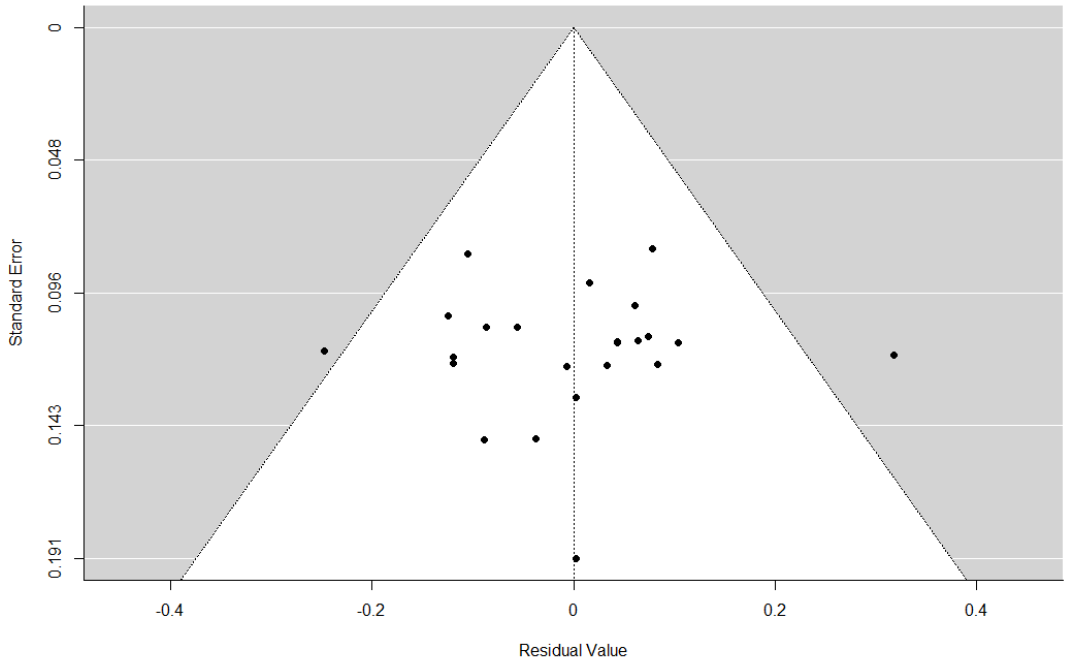

Figure 2: Loneliness and Academic Achievement Funnel Plot

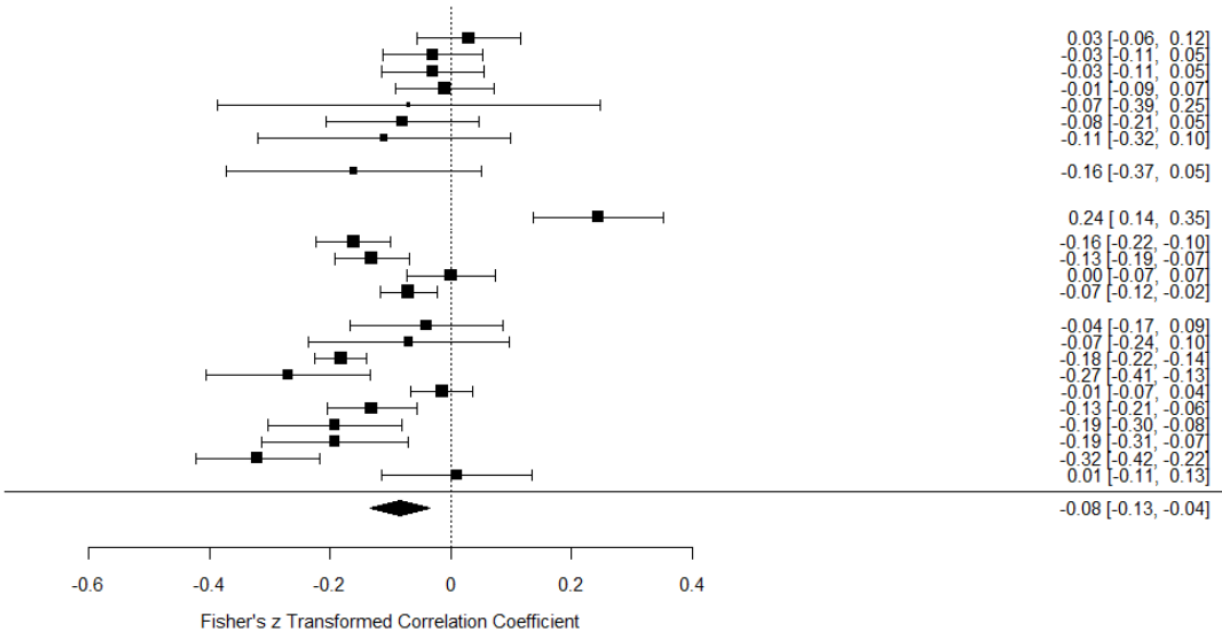

Figure 3: Loneliness and Academic Achievement Forrest Plot.

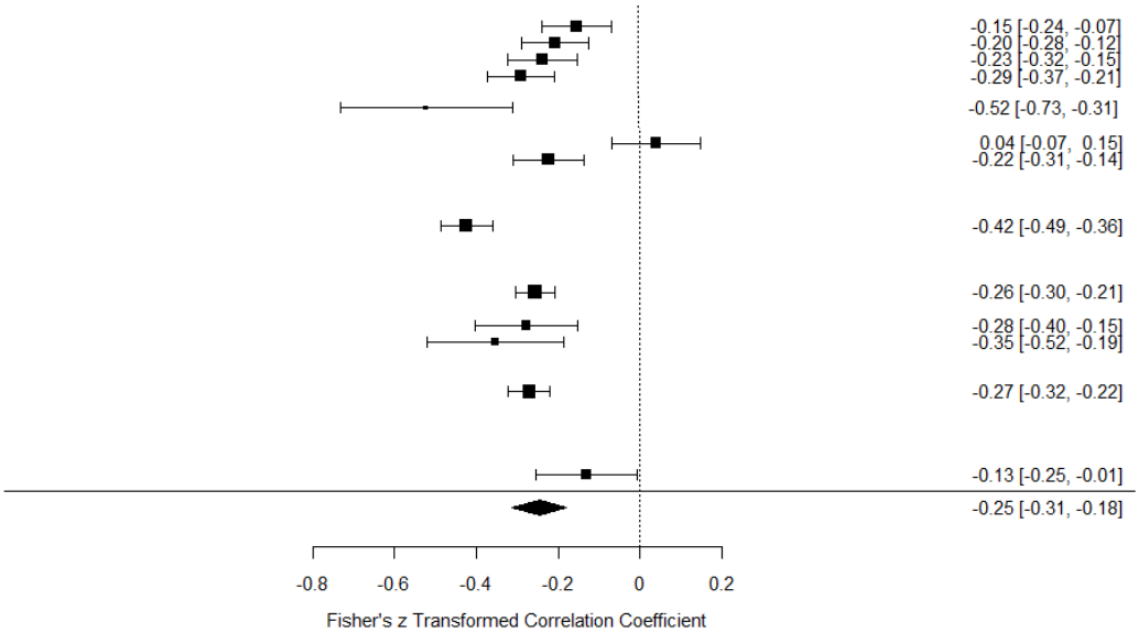

Figure 4: Loneliness and Academic Engagement Forrest Plot.

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