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Article

# Parental Homework Involvement and Students' Achievement: A Three-Level Meta-Analysis

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**ABSTRACT**

**Background:** Applying a three-level meta-analysis, the goal of our investigation was to examine the relationship between parental homework involvement and students' achievement, and to investigate whether certain study features could have resulted in the inconsistent results relating to this relationship from prior studies. **Method:** We identified a total of 28 studies (32 independent samples) with 252 effect sizes for a total of 378222 participants. **Results:** Our meta-analysis revealed an overall weak negative relationship between parental homework involvement and students' achievement ($r = -0.064$, $p < 0.001$). The overall relationship was moderated by the dimension of parental homework involvement. Specifically, students' achievement was positively related to autonomy support, but largely unrelated to content support, parental control, frequency, and mixed. Additionally, the overall relationship was moderated by achievement measure, grade level, and parent gender. **Conclusions:** Given that parental autonomy support was the only dimension that was positively related to students' achievement, it would be important to conduct qualitative research that provides longitudinal descriptions of parent-child interactions relating to homework tasks as children make their transition from elementary to middle and high school.

## Implicación de los Padres en los Deberes y Rendimiento Académico: un Meta-Análisis de Tres Niveles

***Palabras clave:***
Deberes escolares
Implicación parental
Rendimiento académico
Meta-análisis
Variables moderadoras

**RESUMEN**

**Antecedentes:** Mediante un meta-análisis de tres niveles, el objetivo de esta investigación fue examinar la relación entre la participación de los padres en los deberes escolares y el rendimiento académico de los estudiantes, así como estudiar el rol mediador en esta relación de ciertas variables que podrían haber estado relacionadas con algunos resultados inconsistentes en estudios primarios. **Método:** Se identificaron 28 estudios, con 252 tamaños del efecto, para un total de 378222 participantes. **Resultados:** Los resultados revelaron una débil relación negativa entre la implicación de los padres en los deberes y el rendimiento de los estudiantes ($r = -0{,}064$, $p < 0{,}001$). Esta relación fue moderada por el tipo de implicación parental. Específicamente, el rendimiento de los estudiantes se relacionó positivamente con el apoyo a la autonomía, pero no con el apoyo al contenido, el control de los padres, la frecuencia y la combinación de estas dimensiones. Además, dicha relación fue moderada por la medida de rendimiento, el curso de los estudiantes y el género de los padres. **Conclusiones:** Es necesaria más investigación cualitativa sobre lo que ocurre en torno a las interacciones entre padres e hijos a la hora de la realización de los deberes escolares.

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Commonly considered as "tasks assigned to students by school teachers that are meant to be carried out during non-school hours" (Cooper, 1989, p. 7), homework is a pervasive educational activity globally (Cooper et al., 2006; Xu & Corno, 2022; Xu & Núñez, 2023). As homework involves three major agents (students, parents, and teachers; Sun et al., 2021; Warton, 2001), and as it reflects a classic phenomenon known as "when school goes home" (McDermott et al., 1984, p. 391), one area that has attracted wide and growing attention is parental homework involvement (Fernández-Alonso et al., 2022; Patall et al., 2008; Suárez et al., 2022; Xu & Corno, 2022). Over the years, there have been various primary studies concerning the relationship between parental homework involvement and students' achievement. However, these studies have yielded inconsistent results. This is not surprising, as homework is highly complex and influenced by more variables than any other educational activity (Cooper, 2015; Corno, 1996; Trautwein et al., 2006), and because parental homework involvement is multidimensional and highly controversial (Dumont et al., 2014; Hill & Tyson, 2009; Moroni et al., 2015).

In this sense, several meta-analyses have tapped into the relationship between parental involvement and students' achievement (e.g., Castro et al., 2015; Fan & Chen, 2001; Hill & Tyson, 2009; Kim, 2020, 2022; Jeynes, 2007), in which homework involvement has been treated as one type of involvement for some of these meta-analyses. Two meta-analyses have focused on the relationship between parental homework involvement and students' achievement (Fernández-Alonso et al., 2022; Patall et al., 2008). However, none of these meta-analyses, to the best of our knowledge, has incorporated an emerging line of research pertaining to one important dimension of parental homework involvement – autonomy support – that is increasingly seen to have more beneficial effect on students' achievement (Dettmers et al., 2019; Gonida & Cortina, 2014; Kikas et al., 2022; Viljaranta et al., 2018; Xu & Corno, 2022).

Recent studies have paid increasing attention to the relationship between the quality of parental homework involvement and students' achievement (Benckwitz et al., 2023; Dettmers et al., 2019; Moroni et al., 2015; Silinskas & Kikas, 2019a; Tunkkari et al., 2021; Xu et al., 2017). For instance, involving 1,685 8th graders, Moroni et al. (2015) linked the quantity and quality of parental homework involvement to students' achievement. Results revealed that the frequency of parental homework involvement was negatively associated with students' achievement. Concerning the quality of parental homework involvement, results further indicated that students' achievement was associated negatively with intrusive involvement, and positively with supportive involvement.

As the items in supportive involvement (Moroni et al., 2015) include both content support and autonomy support, and as direct help or content support from parents can be perceived as controlling especially when students do not ask for help or support (Pomerantz et al., 2007), Xu et al. (2017) examined whether autonomy support and content support could be empirically distinguished. Involving 796 8th graders, factorial results revealed that they were empirically distinguishable (CFI = 0.993; SRMR = 0.031; RMSEA = 0.036). In a follow-up study involving 336 9th graders, Xu et al. (2018) further investigated reciprocal influences of content support, autonomy support, homework effort, and students' achievement. Results indicated that higher prior autonomy support resulted in higher subsequent achievement whereas higher prior content support led to lower subsequent achievement, thereby providing further empirical evidence on differentiating content support from autonomy support in research on parental homework involvement.

The need to pay particular attention to autonomy support is, to some degree, further supported by one recent meta-analysis on parental autonomy support and students' achievement (Vasquez et al., 2016). Based on 20 studies that related parental autonomy support to academic achievement, Vasquez et al. (2016) found that parental autonomy support was positively related to academic achievement, with an overall correlation $r = 0.12$ (95% CI [0.07, 0.16]).

Whereas several meta-analyses have examined the association between parental involvement and students' achievement (e.g., Castro et al., 2015; Fan & Chen, 2001; Hill & Tyson, 2009; Kim, 2020, 2022; Jeynes, 2007), two meta-analyses have explicitly examined the association between parental homework involvement and students' achievement (Fernández-Alonso et al., 2022; Patall et al., 2008). Patall et al. (2008) concluded that "the overall effect of parent involvement in homework was small and often not significant" (p. 1087), and that the overall effect was moderated by grade level, subject matter, and dimension of parent involvement. In a more recent meta-analysis based on results from PISA evaluations, Fernández-Alonso et al. (2022) have more specifically focused on one dimension of parental homework involvement – the frequency of parental help. Their findings indicated that more parental homework help was related to lower academic achievement, and that the overall effect was moderated by geographical region.

It is important to mention that while the above two meta-analyses (Fernández-Alonso et al., 2022; Patall et al., 2008) did not incorporate autonomy support as one dimension of involvement, both alluded to the potential promise of the quality of involvement or parental autonomy support in the homework process. Patall et al. (2008) observed "as students reach adolescence, it may be important that parents gradually withdraw from the homework process and shift their involvement more to support of the child's own autonomous efforts" (p. 1089). Similarly, Fernández-Alonso et al. (2022) argued that "in homework involvement, the 'how' is much more important than the 'how much'... there are forms of involvement that, whether by unskilled teaching on the part of the parents, or through the use of excessively controlling, meddling, or punitive styles, have negative repercussions on academic performance" (p. 63).

It is also important to consider the existence of a range of variables or study features that could contribute to inconsistent results in prior studies on parental homework involvement and students' achievement. Based on our review of primary studies and two prior meta-analyses on this topic (Fernández-Alonso et al., 2022; Patall et al., 2008), we identified the following factors as potential moderators. These include dimension of involvement, achievement measure, grade level, parent gender, geographical region, subject matter, research design, publication type, and sampling method.

Regarding the dimension of parental involvement, as discussed above, there are different dimensions and their influences on students' achievement may vary. In our meta-analysis, we coded parental homework involvement in a study into one of the five dimensions; autonomy support, content support, parental control, frequency, and

mixed. Parental involvement was coded as "autonomy support" when it attended to students' ideas and supported their homework initiatives (e.g., Xu et al., 2017). Parental involvement was coded as "content support" when it provided direct support on the content of assignments (e.g., Trautwein et al., 2006). Parental involvement was coded as "parental control" when it functioned to monitor, control, and interfere with homework assignments (e.g., Moroni et al., 2015; Núñez et al., 2021). Parental involvement was coded as "frequency" when it focused on the frequency or amount of its involvement (e.g., Fernández-Alonso et al., 2022). A study was coded as "mixed" when it included more than one dimension of involvement (e.g., Cunha et al., 2018; Driessen et al., 2005).

Regarding performance measures, achievement measures used in primary studies consist of standardized tests (e.g., Xu & Corno, 2022) and unstandardized tests (e.g., Lee & Bowen, 2006). As different assessment measures may contribute to inconsistent findings in meta-analyses (Andrews et al., 2006), it would be necessary to test whether achievement measure (i.e., standardized vs. unstandardized) moderates the association between parental homework involvement and students' achievement.

Besides, previous meta-analyses suggest that the relationship between parental homework involvement and students' achievement is moderated by grade level. For example, Patall et al. (2008) reported that parental homework involvement could benefit elementary and high school students, but not middle school students. By contrast, Jeynes (2005, 2007) found that parental homework involvement could benefit urban secondary school students, but not urban elementary school students. In this same direction, the data provided by the study by Núñez et al. (2015) showed that students' perceptions of their parents' involvement in homework (i.e., perceived parental support) were significantly related to their homework behaviors (time spent on homework completion, amount of homework completed, and homework time management), and with academic performance, only for the middle and high school samples. For elementary students these relationships were not statistically significant.This lack of relationship between homework parental involvement (i.e., responsiveness and structure) and academic performance in elementary school students has also been found in a recent longitudinal study (Benckwitz et al., 2023).

Regarding the gender role of parents, whereas the majority of primary studies on the relationship between parental homework involvement and students' achievement involve parents (e.g., Bembenutty, 2005), other studies involve mothers (e.g., Kikas et al., 2022) or fathers (e.g., Tan & Goldberg, 2009). As little is known about whether mothers and fathers differ regarding their homework involvement and influence on children's achievement (e.g., Silinskas et al., 2013), it would be intriguing to test parent gender as another moderator in our meta-analysis.

Regarding the geographical area, primary studies were conducted across different geographical regions, including American, Europe, and Asia. As one recent meta-analysis (Fernández-Alonso et al., 2022) reported that geographical region moderated the association between the frequency of parental homework involvement and students' achievement, there is a need to examine geographical region as a potential moderator in our meta-analysis.

In addition to the above, previous meta-analyses on parental homework involvement (Fernández-Alonso et al., 2022; Patall et al., 2008) included subject matter as a one of the moderators, as involvement in certain subjects (e.g., mathematics) may be more challenging for parents. Although a more recent meta-analyses (Fernández-Alonso et al., 2022) reported that the relationship between the frequency of parental homework involvement and students' achievement was not moderated by subject matter, it would be important to test this moderator in our meta-analysis that include other dimensions of involvement.

Regarding the type of design used, primary studies were conducted using both cross-sectional design (e.g., Dettmers et al., 2019) and longitudinal design (e.g., Kikas et al., 2022). As research design may contribute to inconsistent results in meta-analyses (De Matos et al., 2007; Vazsonyi et al., 2017), we incorporated it (i.e., cross-sectional vs. longitudinal) as a potential moderator in our study.

In addition, primary studies on the relationship between parental homework involvement and students' achievement are available in journal articles, conference papers, and dissertations.

As journal articles and certain conference papers are peer-reviewed, and as studies with significant findings are more likely to be published than those with insignificant findings (Card, 2015), publication type may contribute to inconsistent results across studies. Thus, there is a need to test publication type as a moderate variable in our meta-analysis.

Finally, another factor leading to inconsistent results regarding the association between parental homework help and students' achievement is sampling method, because sample representativeness could affect the accuracy and generalizability of results. Therefore, there is a need to include sampling method as a moderator in our study.

Accordingly with all of the above, the goal of our study is to provide an up-to-date meta-analysis of recent studies (particularly pertaining to autonomy support) on the association between parental homework involvement and students' achievement, by applying the most current meta-analytic model. In particular, we apply the three-level meta-analytic approach (Assink & Wibbelink, 2016; Cheung et al., 2014) to investigate the heterogeneity among studies and among effect sizes within the same study (i.e., to address non-independence among effect sizes within the same study), something that has not been used in prior meta-analyses on parental involvement, with parental homework involvement in particular. Thus, by decomposing the variance at different levels (i.e., at the sample level, at the within-study level, and at the between-study level), the three-level meta-analytic model is likely to provide a more accurate estimate of the association between parental homework involvement and students' achievement. In addition, it is intended to examine the moderating role of some variables that might have contributed to inconsistent results across studies, by incorporating an emerging line of recent studies on parental autonomy support, and by applying the three-level meta-analytic approach. Specifically, our study attempts to answer the following four questions:

1. What is the overall correlation between parental homework involvement and students' achievement?
2. Is this relationship influenced by the quality of primary studies?
3. Is this relationship invariant across different subject matter, grade level, or geographical region?

4. Is this relationship invariant or is affected by other study features including dimension of involvement, achievement measure, parent gender, research design, publication type, and sampling method?

## Method

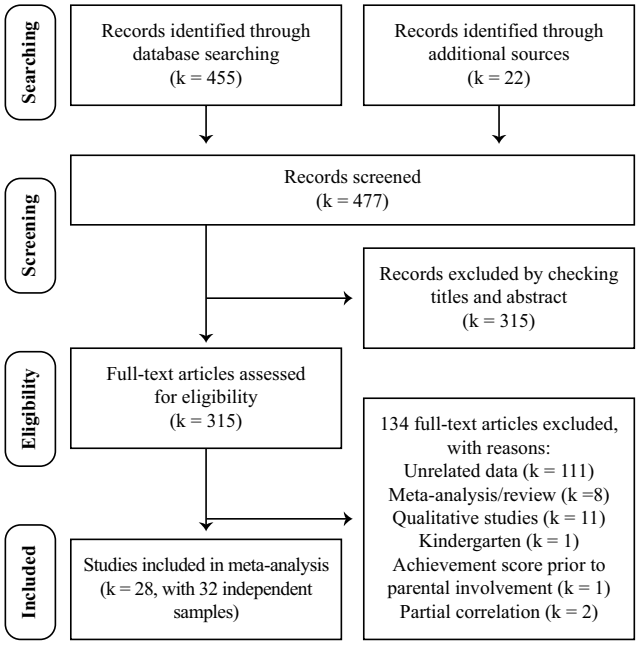
### Literature Search and Selection

To gather primary studies that linked parental homework involvement to academic achievement, we first searched the following databases: *Taylor & Francis, Sage, Elsevier, John Wiley, Spinger, PsycINFO, Education Resources Information Center (ERIC)*, and *JSTOR*. Specifically, we used the following terms and their combinations to search the title, abstract, and keyword: "parental" (or "paternal", "maternal", "mother", "father") "involvement" (or "assistance", "help"); "homework"; and "achievement".

To minimize publication biases, we further searched other databases (e.g., google scholar and ProQuest Dissertations & Theses Global) for grey literature such as dissertations, preprints, government reports, or conference proceedings. Moreover, to order not to miss relevant studies on parental homework involvement and achievement, we searched primary studies in meta-analyses and reviews, including Ariës et al. (2015), Boonk et al. (2018), Castro et al. (2015), Fan and Chen (2001), Henderson and Mapp (2002), Kim (2022), Patall et al. (2008), and Vasquez et al. (2016).

Our search included documents available as of October 31, 2022, yielding 477 unique records. Through our reading of the titles, abstracts, and keywords, we identified 162 primary studies as possible candidates for inclusion into our study. Figure 1 visually depicts our search process. These studies were retrieved and set aside for further scrutiny.

**Figure 1**
*Flowchart for Inclusion of Primary Studies in the Meta-analysis*




### Inclusion and Exclusion Criteria

To be included in our study, a primary study must meet the following criteria:

1. Participants of a primary study must be regular students in elementary, middle, or high school. For example, Del Río et al. (2017) involved kindergartners, and Longley (1993) involved students with attention deficit hyperactivity disorder. These studies were excluded from our study.
2. A primary study must focus on parental homework involvement, which may include the following dimensions: frequency of parental help; content support; autonomy support; parental control (or intrusive involvement, unwanted help, monitoring); and mixed (any combinations of the above dimensions). Excluded from our meta-analysis were primary studies on parental involvement in general (i.e., without specifically linking to parental homework involvement).
3. A primary study must include academic achievement (e.g., mathematics, science, reading, and language arts). For example, Bhanot and Jovanovic (2009) linked parental homework involvement to students' science achievement beliefs, not science achievement. As a result, it was excluded from our meta-analysis. In addition, a primary study must include academic achievement after parental homework involvement. For example, Núñez et al. (2017) linked prior achievement and homework behaviors to parental homework involvement. Hence, it was excluded from our meta-analysis.

When a study contained parental homework involvement and students' achievement more than one data point, we only included the relationship between parental homework involvement at data point one and subsequent students' achievement at data point two (or three). For example, Silinskas et al. (2022) linked maternal homework involvement to students' achievement across Grades 6, 7, and 9. We only included maternal homework involvement at data point one (Grade 6) and students' achievement at data point three (Grade 9).

4. A primary study must report zero-order correlations between parental homework involvement and students' achievement or supply sufficient data that could be converted to zero-correlations. As a result, studies applied regression analyses (Dumont et al., 2012; Strayhorn, 2010) or reported partial correlations (Pezdek et al., 2002) were excluded from our study.
5. A primary study must report some basic information. For instance, sample size and grade level were essential for our purpose. In addition, we focused on primary studies published in English; therefore non-English publications were excluded.

### Study Features Extracted from Primary Studies

To identify the study features that could serve as possible moderators to explain mixed results of primary studies, we implemented a systematic process to code pertinent features of primary studies included in our study. The final set of the study features is shown in Table 1. We described the process for coding these features below.

**Table 1**
*Study Features Extracted in the Primary Studies*

| Study features | | Independent samples | | Effect sizes | |
|---|---|---|---|---|---|
| | | k1 | % | k2 | % |
| Involvement dimension[a] | Autonomy support | 18 | 30.00 | 67 | 26.59 |
| | Content support | 9 | 15.00 | 47 | 18.65 |
| | Frequency | 7 | 11.67 | 7 | 2.78 |
| | Mixed | 6 | 10.00 | 10 | 3.97 |
| | Parental control | 20 | 33.33 | 121 | 48.02 |
| Achievement measure[a] | Unstandardized | 15 | 48.39 | 101 | 40.00 |
| | Standardized | 16 | 51.61 | 151 | 60.00 |
| Grade level[b] | Elementary school | 13 | 40.63 | 148 | 59.00 |
| | Junior high school | 7 | 21.88 | 58 | 23.00 |
| | Senior high school | 1 | 3.13 | 2 | 1.00 |
| | Mixed | 11 | 34.38 | 44 | 17.00 |
| Parent gender[a] | Fathers | 3 | 8.57 | 32 | 12.70 |
| | Mothers | 7 | 20.00 | 126 | 50.00 |
| | Parents | 25 | 71.43 | 94 | 37.30 |
| Geographical region[b] | America | 13 | 40.63 | 50 | 19.84 |
| | Asia | 5 | 15.63 | 18 | 7.14 |
| | Europe | 14 | 43.75 | 184 | 73.02 |
| Subject matter[a] | Mathematics | 21 | 51.22 | 125 | 50.00 |
| | Language arts | 7 | 17.07 | 33 | 13.00 |
| | Reading | 6 | 14.63 | 85 | 34.00 |
| | Social Sciences | 1 | 2.44 | 2 | 1.00 |
| | Mixed | 6 | 14.63 | 7 | 3.00 |
| Research design[b] | Cross-sectional | 29 | 90.63 | 87 | 35.00 |
| | Longitudinal | 3 | 9.38 | 165 | 65.00 |
| Publication type[b] | Conference | 1 | 3.13 | 2 | 0.79 |
| | Dissertation | 6 | 18.75 | 30 | 11.90 |
| | Journal | 25 | 60.98 | 220 | 87.30 |
| Sampling method[b] | Convenient | 27 | 84.38 | 187 | 74.00 |
| | Random | 5 | 15.63 | 65 | 26.00 |

*Note.* [a]Some studies reported several data sources simultaneously. [b]Other studies reported more than one independent sample. Please see Table S1 and the dataset for details.

## Coding Process and Reliability

The coding process included several steps. The first step was to make coding plan. According to the purpose and research question of the current study, the coding plan included variables listed in Table 1 and Table S1. Some variables such as research design (correlation vs. experiment), student gender, prior knowledge, reliability of measure of parental homework involvement, classroom type, and SES or educational level of parents were in the initial coding plan, but not presented here because the primary studies did not provide sufficient information.

The second step was to extract information the primary studies. Several graduate students in the author list received coding training from the first and the corresponding author which provided the basic information and requirement about the meta-analysis, and coding processing in particular. After coding five primary studies, they attended a conference to discuss about how to appropriately code relevant study features. Following that, they extracted information from the rest of the primary studies.

The third step was for cross checking and validation. It was conducted by two graduate assistants and the corresponding author. When encountering inconsistence, they discussed and re-extracted relevant information for corresponding primary studies. Following that, the corresponding author checked all the primary studies and cells of the coding table. Overall, the reliability (i.e., the coding consistency rate) was 96%, indicating a high degree of consistency between coders in meta-analyses.

## Statistical Computation

### *Effect Size Indicator*

The zero-order coefficient ($r$) served as effect size indicator our study (Borenstein et al., 2009). Because the zero-order coefficient is not normally distributed, its Fisher's Z transformation ($Z_r$) was used before the later weighted-average computation. To facilitate understanding, $Z_r$ was transformed into the zero-order correlation.

It is important to note that all effect size indicators were included if they met the criteria discussed above (i.e., regarding inclusion and exclusion criteria). Meanwhile, we did not average the effect sizes or choose one effect size from several dependent effect size indicators, because the three-level model introduced in the next section can deal with the issue of dependence and satisfy the independence requirement of statistical methods (Assink & Wibbelink, 2016).

### *Fixed-effects, Random-Effects, and Mixed-Effects Models*

The major difference between the fixed-effects model and random-effects model is the resource of the errors. In the fixed-effects model, the variation between effect sizes is caused only by the random error (from participants). In the random-effects model, however, the variation between effect sizes is caused by the random error and some systematical error (from a study feature, for example, type of publication). Because of the structure of errors, the results of fixed-effects model can not be generalized to other situations, but the results of random-effects model can (Borenstein et al., 2009).

As a revised version, the three-level model hypothesizes there are three types of errors: participants (level 1), outcomes (level 2; effect sizes), and studies (level 3; Assink & Wibbelink, 2016). The three-level model employed here belongs to the family of the mixed-effects model, because it used a random effect model to estimate the common shared effect size within each cluster, which hypothesizes the overall effect sizes in different clusters were different from each other (Assink & Wibbelink, 2016; Harrer et al., 2021).

The justification for employing the three-level model in our meta-analysis is that it can estimate the influence of the dependence between effect sizes. The influence of dependence cannot be removed or estimated in the traditional fixed-effects or random-effects model which can distort meta-analytic results. Second, our meta-analysis involved participants from different educational systems in America, Europe, and Asia, which may introduce systematical variations, not only a random error. Third, the three-level model uses the variation between effect sizes and decreases the type II error in statistical inference, thereby enhancing the power of

meta-analyses. As a result, our meta-analysis used the three-level model, which is mixed-effects model (Assink & Wibbelink, 2016).

### *Heterogeneity Test*

The Q test, the $I^2$ index, is defined as the percentage of variation in the primary studies that caused by between-study variance (Borenstein et al., 2009). Using a frequently cited "rule of thumb," 25%, 50%, and 75% are often considered as cut-off values for low heterogeneity, moderate heterogeneity, and substantial heterogeneity (Borenstein et al., 2009). Under the condition of the three-level model, the total value of I2 is divided into two parts: $I^2$ (level 2) and I2 (level 3) (Assink & Wibbelink, 2016).

$Tau^2$ refers to the variance caused by the variety from between-study which can be used to evaluate the size of variety between-study. When the three-level model is applied, the total value of $Tau^2$ equals the sum of two parts: $Tau^2$ (level 2) and $Tau^2$ (level 3; Assink & Wibbelink, 2016).

### *Detection of Publication Bias*

Publication bias is the errors caused by some invisible selection process in which those studies with significant results receive higher possibility to be published (Borenstein et al., 2009). Several methods are frequently used to detect publication bias. Rosenthal's (1979) Fail-safe *N* is defined as the number of primary studies retrieved and incorporated into the meta-analysis so that the mean effect in missing studies was zero (Borenstein et al., 2009).

A funnel plot is a scatter plot in which the observed effect sizes loaded on the x-axis and their standard error on the y-axis (Borenstein et al., 2009). The trim and fill method is often applied to adjust for funnel plot asymmetry (Duval & Tweedie, 2000). Its algorithm is simple. After imputing some "missing" results, this method re-estimates the total effect size based on the new datasets. Therefore, two groups of estimated total effect sizes can be generated after implementing the trim and fill method: one generated under the asymmetry, and the other under the condition of symmetry (because of adding some missing primary studies).

### *Assessment of Study Quality*

The quality of the primary studies was scored on the tool named as Basic Quality Assessment of Primary Study (BQAPS), which was based on the framework of Cochrane risk of biases (Higgins et al., 2011). The BQAPS can be used to evaluate quality of the basic aspects (including design, reliability, validity, statistic methods, and implementation process) of an individual study (see appendix for details: https://osf.io/u3syb/?view_only=c8894b14dd28406da57257bd9930a010). The BQAPS has 12 items, and each item can be scored on a three-point ordinal scale. The score of "0" indicates that there is not any information for judgement. The score of "1" indicates that the item does not satisfy the requirement of research methodology. The score of "2" indicates that there is adequate information and the item meets the requirement of research methodology. A higher score indicates lower risk of bias.

The BQAPS's total score ranges from 0 to 24. A total score ranging from zero to six indicates the primary study quality is low level; and a total score from six to 12 suggests that the study quality is medium-low level; and a total score from 12 to 18 locates in the category of medium-high level; and a score larger than 18 means very high level of quality. The total score of BQAPS can serve as a continuous variable.

### *Statistical Computation Tools*

All statistical computations were completed in the R environment (R Core Team, 2022). The metafor package was applied to carry out the main analyses under the three-level model (Viechtbauer, 2010; Harrer et al., 2021). Aditionally, the metafor package was applied to create the funnel plot (Assink & Wibbelink, 2016; Balduzzi et al., 2019; Harrer et al., 2021).

The moderators in our study included dimension of parental involvement, achievement measure, grade level, parent gender, geographical region, subject matter, research design, publication type, and sampling method. As these moderators are categorical variables, they were set as dummy variables (see Table 3 for reference groups) and were analyzed using the categorical meta-regression in the metafor package (Viechtbauer, 2010; Harrer et al., 2021).

## Results

### Study Characteristics

Based on the coding of 162 primary studies considered as potentially relevant, 28 studies satisfied the inclusion criteria as discussed above, therefore eligible for our study. These 28 studies involved 32 independent samples. Two studies (Dumont et al., 2012; Harris, 1991) involved two independent samples, one study (Schultz, 1999) involved three independent samples. The primary studies were published between 1988 and 2022. The total accumulated sample size was 378222. The sample sizes ranged from 79 to 343900, with median of 449. Table 1 lists study characteristics and their frequency distribution. Basic information of each primary study are included in Table S1 (see https://osf.io/u3syb/?view_only=c8894b14dd28406da57257bd9930a010).

### Heterogeneity Tests

As presented in Table 2, the Q test was statistically significant, indicating substantial heterogeneity across the effect sizes ($Q(251) = 12924.145$, $p < 0.001$). The total $I^2$ was 99%, indicating substantial heterogeneity among the included primary studies. Specifically, 1.0% of the total variance could be attributed to level 1 variation (at the sampling); 82.4% could be attributed to the level 2 variation (within-study); and 16.6% could be attributed to the level 3 variation (between-study). As commonly recommended (Borenstein et al., 2019; Hunter & Schmidt, 1990), investigating the moderation effects of other variables on the overall effect size can be meaningful if less than 75% of the variance is accounted for by the sampling variance. In our study, only 1.0% variance was attributed to the samples. As a result, there is a critical need to

examine and identify the potential moderators in our meta-analysis (see Table 3).

### Publications Bias

First, funnel plot analysis indicated it was somewhat asymmetric where more effect sizes located in the left side, and the missed effect sizes located in the right (see Figure 2). Second, trim and fill method identified that the number of missed effect sizes is 49. After adding 49 effect sizes, we found that re-estimated overall effect size was $r = -0.034$ (95% CI [−0.060, −0.080], $p < 0.001$), which was almost identical to the previous pooled effect size $r = -0.064$ (95% CI [−0.105, −0.023], $p < 0.001$). Third, Rosenthal's Fail-safe $N$ of our meta-analysis was 266869.7, which is much greater than the critical value that $5k + 10 = 5 \times 32 + 10 = 170$ (Card, 2015). Overall, these assessment results suggest that the publication bias would be small and negligible.

### Quality Assessment

Of the total of 32 independent samples, 3 (9.38%) were in the medium-low quality level (quality score ranging from 7 to 12); and 24 (75.00%) were in the medium-high quality level (quality score ranging from 13 to 17); and 5 (15.63%) were in high quality level (quality score ranging from 18 to 24). Of the total of 252 effect sizes, 13 (5.16%) were in the medium-low quality level; 223 (88.49%) were in the medium-high quality level; and 16 (6.35%) were in high quality level.

Taking the quality score as independent variable, the values of effect sizes as dependent variables, a meta-regression was conducted. Results revealed that $F_{(1, 250)} = 0.180$; $p = 0.671$; intercept = −0.116; se = 0.127; beta coefficient = 0.003; se = 0.008; $t = 0.425$; $p = 0.671$. The variance between primary studies = 0.006, and the variance among effect sizes = 0.029. These results showed a non-significant correlation between quality score and effect size, suggesting that the quality of the primary studies did not systematically influence the effect sizes.

### Main Effect

Table 2 presents results from the three-level meta-analysis. The overall relationship between parental homework involvement and students' achievement across all primary studies ($k1 = 28$) and effect sizes ($k2 = 252$) was $r = -0.064$ ($p < 0.001$), with 95% confidence interval varying from −0.105 to −0.023. This finding suggests that, in spite of inconsistent results across primary studies, overall, there was a negative, although weak, relationship between parental homework involvement and students' achievement.

About 82.4% of the total variance could be attributed to within-study differences in effect sizes (level 2) and about 16.6% could be attributed to between-study differences (level 3). Provided with the variability in effect sizes within and between studies (i.e., heterogeneity), it would be important to conduct follow up analysis for potential moderators that may contribute to the inconsistence among the effect sizes across primary studies.

### Effects of Moderators

Results of all moderator analysis are displayed in Table 3. These moderators included dimension of parental involvement, achievement measure, grade level, parent gender, geographical region, subject matter, research design, publication type, and sampling method.

**Figure 2**

*Funnel Plot of Effect Sizes*

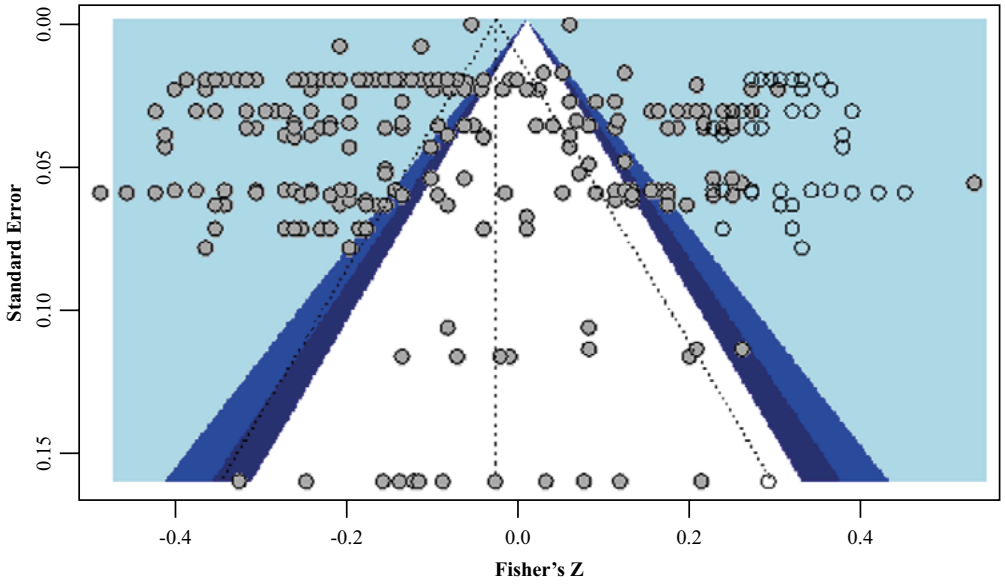


**Table 2**
*Results for the Overall Analysis*

| *K* | Fisher's Z (SE) | Zero-order r (95% CI) | *r* | *t* | $Q_{total}$ | Tau² (% in total variance) | |
|---|---|---|---|---|---|---|---|
| | | | | | | Level 2 | Level 3 |
| 252 | −0.064 (0.021) | −0.064 (−0.105, −0.023) | −0.064 | −3.073 | 12924.145*** | 0.0290 (82.401) | 0.0058 (16.602) |

*K* = number of effect sizes; Variance in level 2 = variance in effect sizes; Variance in level 3 = variance between the primary studies.
***$p < .001$

**Table 3**
*Results of Moderator Analyses*

| Moderators | | k2 | Fisher's Z (95% CI) | | Zero-order r (95% CI) [b] | | *F* | Tau² | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Level 2 (effect sizes) | Level 3 (studies) |
| Involvement dimension | Autonomy support[a] | 67 | 0.165 | (0.114, 0.216) | 0.164 | (0.114, 0.213) | 70.317*** | 0.012 | 0.010 |
| | Content support | 47 | −0.317 | (−0.373, −0.261) | −0.151 | (−0.094, 0.119) | | | |
| | Frequency | 7 | −0.345 | (−0.445, −0.244) | −0.178 | (−0.164, 0.136) | | | |
| | Parental control | 121 | −0.318 | (−0.356, −0.279) | −0.152 | (−0.077, 0.102) | | | |
| | Mixed | 10 | −0.218 | (−0.330, −0.105) | −0.053 | (−0.051, 0.269) | | | |
| Achievement measure | Standardized[a] | 151 | −0.114 | (−0.162, −0.066) | −0.114 | (−0.161, −0.066) | 7.150** | 0.029 | 0.003 |
| | Unstandardized | 101 | 0.096 | (0.025, 0.167) | −0.018 | (−0.136, 0.101) | | | |
| Grade level | Elementary school[a] | 148 | −0.143 | (−0.181, −0.104) | −0.142 | (−0.179, −0.104) | 7.362** | 0.029 | 0.001 |
| | Junior high school | 58 | 0.141 | (0.078, 0.204) | −0.002 | (−0.103, 0.100) | | | |
| | Senior high school | 3 | 0.160 | (−0.046, 0.367) | 0.017 | (−0.223, 0.257) | | | |
| | Mixed | 43 | 0.101 | (0.032, 0.170) | −0.042 | (−0.148, 0.066) | | | |
| Parent gender | Mothers[a] | 126 | −0.130 | (−0.202, −0.057) | −0.129 | (−0.199, −0.057) | 3.594* | 0.028 | 0.006 |
| | Fathers | 32 | 0.086 | (0.005, 0.166) | −0.044 | (−0.194, 0.109) | | | |
| | Parents | 94 | 0.090 | (0.002, 0.178) | −0.040 | (−0.197, 0.120) | | | |
| Geographical region | America[a] | 50 | −0.070 | (−0.138, −0.003) | −0.070 | (−0.137, −0.003) | 2.711 | 0.029 | 0.004 |
| | Europe | 184 | −0.022 | (−0.107, 0.063) | −0.092 | (−0.240, 0.537) | | | |
| | Asia | 18 | 0.114 | (−0.009, 0.237) | 0.044 | (−0.146, 0.230) | | | |
| Subject matter | Mathematics[a] | 125 | −0.074 | (−0.121, −0.026) | −0.074 | (−0.120, −0.026) | 0.512 | 0.029 | 0.006 |
| | Language arts | 33 | 0.046 | (−0.031, 0.124) | −0.028 | (−0.151, 0.098) | | | |
| | Reading | 85 | −0.009 | (−0.061, 0.042) | −0.083 | (−0.180, 0.016) | | | |
| | Social sciences | 2 | 0.038 | (−0.227, 0.302) | −0.036 | (−0.335, 0.269) | | | |
| | Mixed | 7 | 0.045 | (−0.130, 0.220) | −0.029 | (−0.246, 0.192) | | | |
| Research design | Cross-sectional[a] | 87 | −0.031 | (−0.080, 0.018) | −0.031 | (−0.080, 0.018) | 5.173* | 0.029 | 0.004 |
| | Longitudinal | 165 | −0.089 | (−0.167, −0.012) | −0.119 | (−0.242, 0.006) | | | |
| Publication type | Conference[a] | 2 | −0.008 | (−0.292, 0.277) | −0.008 | (−0.284, 0.270) | 0.221 | 0.029 | 0.006 |
| | Dissertation | 30 | −0.083 | (−0.386, 0.220) | −0.091 | (−0.590, 0.460) | | | |
| | Journal | 220 | −0.052 | (−0.340, 0.236) | −0.060 | (−0.559, 0.472) | | | |
| Sampling method | Non-random | 187 | −0.059 | (−0.107, −0.011) | −0.059 | (−0.107, −0.011) | 0.103 | 0.029 | 0.006 |
| | Random | 65 | −0.016 | (−0.112, 0.081) | −0.075 | (−0.216, 0.070) | | | |

*Notes.* [a]Reference group in multiple regression in the three-level model. [b]Zero-order r values of the reference group were computed using the following formula, zero-order r = $(e^{(2*\text{Fisher's Z})} - 1)/(e^{(2*\text{Fisher's Z})} + 1)$ (Borenstein et al., 2009, p. 42). Other groups must get their real Fisher's Z before using this formula above. The real Fisher's Z value of a non-reference group can be retrieved by adding the value of reference group into the value listed in its cell. For example, the real Fisher's Z value of content support = 0.165 + (−0.317) = −0.151. The value of lower- and upper-limit of 95% CI can be computed similarly.

### *Involvement Dimension*

Based on a categorical meta-regression, we found a significant moderating effect of dimension of parental homework involvement ($F_{(4, 247)} = 70.317$; $p < .001$). Specifically, autonomy support was positively associated with students' achievement ($r = 0.164$, 95% CI [0.114, 0.213]). By contrast, the relationship could not be statistically distinguished from zero (a 95% confidence interval including zero) for content support ($r = −0.151$, 95% CI [−0.094, 0.119]; frequency ($r = −0.178$, 95% CI [−0.164, 0.136]); parental control ($r = −0.152$, 95% CI [−0.077, 0.102]; and mixed ($r = −0.053$, 95% CI [−0.051, 0.269]. These results indicated that autonomy support could significantly improve students' achievement, while other dimensions of parental homework involvement (content support, parental control, frequency, and mixed) was largely unrelated to students' achievement.

### *Achievement Measure*

Results indicated significant differences ($F_{(1, 250)}$ = 7.150; $p$ = 0.008) between standardized measure and unstandardized measure. Specifically, the effect sizes of primary studies with standardized measure were $r$ = −0.114 (95% CI [−0.161, −0.066]), whereas the effect sizes of primary studies with unstandardized measure were statistically equal to zero ($r$ = −0.018, 95% CI [−0.136, 0.101]).

### *Grade Level*

We found significant differences when considering the moderator effect of grade level ($F_{(3, 248)}$ = 7.362; $p$ < 0.001). Specifically, the effect sizes of primary studies involving elementary school were $r$ = −0.142 (95% CI [−0.179, −0.104]). By contrast, the effect sizes of studies involving other grade levels were statistically equal to zero, including junior high school ($r$ = −0.002, 95% CI [−0.103, 0.100]); senior high school ($r$ = 0.017, 95% CI [−0.223, 0.257]); and mixed ($r$ = −0.042, 95% CI [−0.148, 0.066]).

### *Parent Gender*

As with grade level, we found a significant moderating effect of parent gender ($F_{(2, 249)}$ = 3.594; $p$ = 0.029). Specifically, the effect sizes of primary studies involving mothers were $r$ = −0.129 (95% CI [−0.199, −0.057]). On the other hand, the effect sizes of primary studies involving fathers ($r$ = −0.044, 95% CI [−0.194, 0.109]) and parents ($r$ = −0.040, 95% CI [−0.197, 0.120]) were statistically equal to zero and thus unrelated to students' achievement.

### *Geographical Region*

We did not find significant moderating effect of geographical region ($F_{(2, 249)}$ = 2.711, $p$ = 0.068). Specifically, the effect sizes of studies conducted in America were $r$ = −0.070 (95% CI [−0.137, −0.003], whereas the effect sizes of studies included in Europe ($r$ = −0.092, 95% CI [−0.240, 0.537]) and in Asia ($r$ = 0.044, 95% CI [−0.146, 0.230]) were statistically equal to zero.

### *Subject Matter*

Our meta-analysis included the effect sizes of primary studies in multiple subject areas, including mathematics, language arts, reading, social sciences, and mixed. We did not find statistically significant moderating effect of subject matter ($F_{(4, 247)}$ = 0.512; $p$ = 0.727).

### *Research Design*

Significant differences were found when observing the moderator effect of research design ($F_{(1, 250)}$ = 5.173, $p$ = 0.024). On the other hand, the effect sizes of studies applying cross-sectional design ($r$ = −0.031, 95% CI [−0.080, 0.018]) and longitudinal design ($r$ = −0.119, 95% CI [−0.242, 0.006]) were statistically equal to zero.

### *Publication Type*

Regarding publication type as a possible moderator, we did not find statistically difference among journal articles, dissertations, and conference papers ($F_{(2, 249)}$ = 0.221, $p$ = 0.802). It seemed that these results did not show any "file drawer problems" for the unpublished work (i.e., studies with nonsignificant findings being less likely to be published).

### *Sampling Method*

Our meta-analysis included the effect sizes of primary studies using nonrandom sampling and random sampling. We found no statistically significant moderating effect of sampling method ($F_{(1, 250)}$ = 0.103; $p$ = 0.749), indicating that the magnitude of effect sizes were stable over different sampling strategies.

## Discussion

Our study systematically synthesized the results of primary studies over the past four decades (i.e., 1988−2022) on the relationship between parental homework involvement and students' achievement, and sought to assess the magnitude of overall relationship between these two variables. Additionally, it assessed whether this relationship was influenced the quality of primary studies. Furthermore, it examined whether some study features or characteristics (dimension of involvement, achievement measure, grade level, parent gender, geographical region, subject matter, research design, publication type, and sampling method) could have contributed to some observed inconsistence concerning this relationship across primary studies.

Our meta-analysis revealed that, across primary studies carried out over the last four decades, the overall correlation between parental homework involvement and students' achievement was −0.064 ($p$ < 0.001). This result is largely in line with meta-analyses on the relationship between parental homework involvement and students' achievements (Fernández-Alonso et al., 2022; Patall et al., 2008). On the other hand, as the literature search in the meta-analysis by Patall et al. (2008) ended in 2004, our meta-analysis has extended Patall et al. (2008) meta-analysis to include primary studies up to 2022. In addition, as the recent meta-analysis by Fernández-Alonso et al. (2022) focused on the relationship between the frequency of parental homework involvement and students' achievement, our meta-analysis has expanded Fernández-Alonso et al. (2022) meta-analysis to include other dimensions of involvement. In both cases, our study used the three-level meta-analytic approach (Assink & Wibbelink, 2016; Cheung et al., 2014) to provide a more accurate estimate of the relationship between parental homework involvement and students' achievement, an approach that has not been previously used in meta-analyses on parental homework involvement.

Based on the BQAPS, our results revealed that the vast majority of independent samples and effect sizes included in our meta-analysis (over 90%) could be regarded as possessing either medium-high quality or high quality. Our results further revealed that the quality of primary studies did not systematically influence the magnitude of effect size. One plausible explanation for this finding is the lack of variability in quality ratings (Austin et al.,

2019; Stevens et al., 2021), thereby potentially limiting our ability to detect a systematic relationship between study quality and effect sizes. Another explanation is that primary studies are likely to have different quality ratings across indicators within studies and these quality indicators may interact (Austin et al., 2019; Feeley, 2020).

### Involvement Dimension

One of the most important findings in our study is that students' achievement was positively related to autonomy support, yet unrelated to other dimensions of parental homework involvement (content support, parental control, frequency, and mixed). A growing body of research, involving students from elementary schools to post-graduate institutions, has reported that autonomy support from parents (and teachers) lead to greater engagement and better performance (Ryan & Deci, 2020). Two previous meta-analyses on parental homework involvement (Fernández-Alonso et al., 2022; Patall et al., 2008) have alluded to the potential promise of parental autonomy support in the homework process.

No prior meta-analyses on this topic to the best of our knowledge, however, have incorporated parental autonomy support along with other dimensions of involvement (e.g., content support, parental control, and frequency or amount). Thus, it can be argued that our meta-analysis extends and expands extant literature, thereby providing empirical support to the proposition that autonomy support as one dimension of parent homework involvement that is distinctive from other dimensions of involvement. This is particularly revealing and has important implications for homework practice and research, as homework involvement is often viewed as the most common yet controversial aspect of parental involvement (Dumont et al., 2014; Hill & Tyson, 2009; Moroni et al., 2015).

### Grade Level

Our meta-analysis revealed that the association between parental homework involvement and students' achievement was negative for elementary school students and not significant from zero for middle and high school students. These findings are not consistent with the meta-analysis by Patall et al. (2008), in which the relationship was negative for middle school students, not significant from zero for elementary school students, and positive for high school students. One likely explanation for this discrepancy is that Patal et al.'s meta-analysis was based on a very small number of studies (i.e., 2-5) involving middle and high school students, whereas our meta-analysis was based on a very small number of studies (i.e., 3) involving high school students. Another plausible explanation is that, during the elementary school years, parents are more likely to react to poor mathematics and reading performance of their children (Silinskas et al., 2013). A related explanation is that, because of limited self-regulation skills (e.g., time management), elementary school students tend to receive more parental monitoring and control than autonomy support (Bronson, 2000; Núñez et al., 2015).

Still another possible explanation is that perceived parental homework involvement is associated with students' productive homework behaviors (e.g., homework time management) at the middle and high school level, yet not at the elementary school level (Núñez et al., 2015). These productive homework behaviors, in turn, influences students' achievement. Thus, it is likely that the lack of linkage between perceived parental homework involvement and productive homework behaviors may further contribute to the parental homework involvement – students' achievement relationship at the elementary school level.

### Subject Matter

Our meta-analysis did not find significant differences across different subjects (mathematics, language arts, reading, social sciences, and mixed). Our result is consistent with the meta-analysis by Fernández-Alonso et al. (2022) that showed the general relationship between parental homework involvement and students' achievement varied little across subjects (mathematics, reading, and science). On the other hand, our result is somewhat not in line with the meta-analysis by Patall et al. (2008) that reported that "involvement had a positive relationship with achievement in verbal subject matter but a negative relationship with achievement in mathematics" (p. 1091). Patall et al. posited that "involvement in mathematics homework may be more difficult for parents" (p. 1091). One likely explanation for this difference (i.e., Patall et al's meta-anallysis on the one hand, and Fernández-Alonso et al.'s and our meth-analyses on the other hand) is that involvement in mathematics homework may become relatively less challenging for parents over the last fifteen years since the meta-analysis by Patall et al. (2008). This explanation is, to some degree, substantiated by a recent literature review on parent involvement and mathematic outcome over the last decade (i.e., 2010 to 2019; Fiskerstrand, 2022), which showed the positive influence of parental involvement on children's mathematics activities. Have recently been exposed to new materials and strategies for learning mathematics, a new generation of parents may become less overwhelmed by the demands of helping their children's mathematics homework.

### Geographical Region

Our meta-analysis did not find significant difference across primary studies carried out in different geographical regions (American, Europe, and Asia) on the relationship between parental homework involvement and students' achievement. This result is not in line with a previous meta-analysis that showed the effects were greater in Europe than in Asia (Fernández-Alonso et al., 2022). Given that the meta-analysis by Fernández-Alonso et al. focused on one dimension of parental involvement (i.e., frequency), whereas our meta-analysis included multiple dimensions of involvement (e.g., autonomy support, content support, parental control, and frequency), it is necessary to include geographical region as a possible moderator in future meta-analyses on the relationship between parental homework involvement and students' achievement.

### Parent Gender

Our meta-analysis further examined whether parent gender moderated the association between parental homework involvement and students' achievement. Results revealed that the relationship was negative for mothers, and not significant from zero for fathers and parents. One possible explanation is that mothers, compared with fathers, are frequently more involved in all aspects of their children's schooling (e.g., homework; Kim & Hill, 2015; Lamb, 2010). Homework involvement in particular tends to be viewed as being the responsibility of mothers, and they more likely to react to

poor academic performance of their children "by providing more help than is typical of fathers" (Silinskas et al., 2013, p. 53). This explanation is to some degree further illustrated by interview data from the study by Kim and Fong (2014) in that mothers' homework involvement tends to be more remedial by focusing on what their children are struggling at school. For example, one student stated:

> My Ma helped me in subjects I wasn't so good at. So for instance, Chinese, English... she would test me on homework given by the teacher. My Ma would also later help me with areas I didn't understand well… When my grades were not stable, then she would get involved. (p.626)

By contrast, fathers get involved in homework when they feel competent and not necessarily because their children are struggling at school. Another student commented, "[My Pa] basically tutored me in math. He was better at math, so he tutored me in math. I was on my own studying Chinese" (p. 626).

### Other Moderate Variables

Aside from involvement dimension, grade level, subject matter, geographical region, and parent gender, our meta-analysis examined other study features that may moderate the association between parental homework involvement and students' achievement. These moderators include publication type, achievement measure, sampling method, and research design.

Our finding regarding publication type is in concordance with the corresponding finding from the metal-analysis by Patall et al. (2008) in that publication type was not significant when applying a random-effects model. As for achievement measure, our meta-analysis found that it moderated the relationship between parental homework involvement and students' achievement, whereas the meta-analysis by Patall et al. (2008) did not find significant difference between standardized and unstandardized measures. Hence, it would be important to include achievement measure as a possible moderator in future meta-analyses.

Concerning sampling method and research design, our analysis revealed no significant differences between studies using random and nonrandom sampling, and between studies based on cross-sectional and longitudinal design. As sampling method and research design were not examined as moderators in previous meta-analyses on parental homework involvement (Fernández-Alonso et al., 2022; Patall et al., 2008), these results extend previous work, by suggesting that the relationship between parental homework involvement and students' achievement would be comparable with what the general literature would suggest based on both correlational and longitudinal designs.

### Limitations and Future Directions

Our meta-analysis extends and expands extant literature on the relationship between parental homework involvement and students' achievement, by providing an up-to-date synthesis of recent findings (e.g., autonomy support), by applying the three-level meta-analytic approach, and by incorporating potential moderators that have not been explored in prior meta-analyses (e.g., parent gender and research design). Yet, certain limitations ought to be acknowledged. Even though our meta-analysis included studies carried out in different geographical regions, it was limited to primary studies written in English. The exclusion of primary studies in other languages may to some extent limit the generalizability of our results. Second, regarding student gender, we found too few studies that contained parental homework involvement – achievement correlations separately for boys and girls. Therefore, it is not clear whether the relationship between parental homework involvement and students' achievement is moderated by student gender. Third, a small number of primary studies were identified at the senior high school level or in subjects other than mathematics, language arts, and reading.

Consequently, it would be desirable to conduct a line of research concerning the relationship between parental homework involvement and students' achievement at the high school level and in other subject matters (e.g., science). Furthermore, the effect of parental homework involvement can be influenced by individual characteristics of children (e.g., prior knowledge; Núñez et al., 2017; Silinskas et al., 2013) and parents (e.g., educational level and pedagogical knowledge; Fernández-Alonso et al., 2022; Patall et al., 2008). Because of the lack of such information in primary studies included in our meta-analysis, we were not able to examine their potential influences on the effect of parental homework involvement in our meta-analysis. It would be informative to examine the interaction of parental homework involvement and individual characteristics of children and parents in further investigation.

In addition, given our finding that parental autonomy support was the only dimension that was positively related to students' achievement, it would be highly desirable to pursue a line of studies that randomly assign parents into different experimental conditions (e.g., autonomy support vs. content support) and then assesse their respective effects on students' achievement. Finally, consistent with the recommendation by Patall et al. (2008), it would be informative to conduct qualitative research that provide thick longitudinal descriptions of what occurs surrounding the parent-child interactions over homework tasks, as children make their transition from elementary to middle and high school.

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