

Component Meta-Regression Analyses of Teen Pregnancy Prevention Evidence Review Studies: Technical Appendices

Appendix to Brief April 2025

Submitted to: Office of Population Affairs, U.S. Department of Health and Human Services

Contract Number: HHSP233201500035I/75P00123F37073

Project Director: Jean Knab

This report appendix is in the public domain. Permission to reproduce is not necessary.

Suggested Citation: Streke, A., Denk, E., Forrester, E., & Cole, R. (2025). Component meta-regression of Teen Pregnancy Prevention Evidence Review studies: Technical appendices. Office of Population Affairs, U.S. Department of Health and Human Services.

Disclaimer: The views expressed in this publication do not necessarily reflect the views or policies of the Office of Population Affairs, U.S. Department of Health and Human Services.



This document contains four appendices to the main brief, which summarized content-related components as predictors of evidence-based programs from the Teen Pregnancy Prevention Evidence Review (TPPER) (Cole et al., 2025). It largely follows the same structure and uses similar approaches to the technical appendix for a recent meta-analysis of TPPER data (Streke et al., 2024).

Another document, the technical appendix for the TPPER meta-analysis by Streke and colleagues (2024), provides details on (1) the TPPER review process; (2) the technical details used to calculate effect sizes, variances, and standard errors for the analysis; and (3) the statistical analytic approaches used (random effects meta-analytic approach, weighting approaches for combining evidence across studies, handling within-study dependence in effect sizes). Because this meta-regression used the same data and several of the same analytic approaches, these details are not repeated here.

The technical appendices for this document include the following:

- Appendix A: TPPER Component Data provides information on how the TPPER collected component data on evidence-based teen pregnancy prevention (TPP) programs.
- **Appendix B: Technical Details** provides information on the underlying data that informed the analysis, including a description of the component-level data and the analytic approaches used in the meta-regression.
- Appendix C: Supplemental Materials provides the full results for each analysis presented in the brief (Exhibit C.1). It also includes three tables of sensitivity analyses to demonstrate the robustness of the benchmark findings (Exhibits C.2 to C.4).



Appendix A: TPPER Component Data



Under the TPPER protocol (version 7.0), programs deemed to have evidence of effectiveness are presented on the TPPER website with detailed information about their components. To obtain consistent information about the components of all evidence-based programs, TPPER requests that program developers complete a checklist to fully enumerate them.

As part of a contract for the Office of Population Affairs, Mathematica developed a standardized checklist for program developers and distributors to organize their TPP programs into seven broad component types: (1) content, (2) delivery mechanism (activity), (3) format, (4) staffing, (5) dosage, (6) environment (referred to as context in this brief), and (7) intended population characteristics (see Forrester & Cole [2023a] for more details about component types and Forrester & Cole [2023b] for the checklist itself). There are a total of 169 individual components across the seven component types in the checklist. Program developers and distributors are expected to document information about the presence or absence of each of these program components.

During the initial development of this checklist in 2021, we shared it with a panel of TPP experts to vet its utility and appropriateness. The experts included program developers, practitioners, researchers, and youth participants of TPP programs. The experts pilot tested the checklist using an evidence-based program they were most familiar with. We worked with them over the course of two meetings to produce successive iterations and enhancements to the components checklist. We then revised the checklist in response to their feedback and prepared it for dissemination. Additional details about the checklist's development can be found in Forrester and colleagues (2024).

For each individual component in the checklist, there are response options for the user to indicate whether the component is (1) present and intended to be offered as part of one or more versions of the program, (2) optional, or (3) not part of the program. For every component selected as present, the developer completing the checklist differentiates its relative importance within the program by indicating whether the component is core to the program. The instructions accompanying the checklist explain that core is a designation that developers or distributors might make if they have a hypothesis based on existing theories, frameworks, or evidence from research that these components influence program outcomes.

We contacted the developers or distributors of the 57 programs on the TPPER list of evidence-based programs from 2022 and 2023 and asked them to document the components of their program using the checklist. We received a total of 51 completed checklists. Three program developers or distributors declined to complete the checklist, and three did not respond to our initial or follow-up requests.



Appendix B: Technical Details



This appendix provides further technical details on the meta-regression methods used to identify content components that were predictive of variation in effect sizes in the TPPER. Descriptions of the approaches used to calculate effect sizes, variances, and standard errors for the analysis and the statistical analytic approaches used (random effects meta-analytic approaches, weighting approaches for combining evidence across studies, and handling within-study dependence in effect sizes) are found in Streke and colleagues (2024). This section provides details about the specific data preparation approaches and analyses used for the meta-regression focused on program components as predictors of TPPER effect sizes.

A. Description of data set

The recent TPPER meta-analysis (Cole et al., 2024) included a total of 99 studies of 79 programs with findings with a moderate or high rating and data collection in the past 20 years. This data set included a total of 618 observations where effect sizes and associated standard errors were non-missing.

As noted in Appendix A, we obtained component-level data for 51 of 57 programs with recent evidence of effectiveness. When we merged the TPPER effect size data with the component-level data from these 51 programs, our merged data set included a total of 56 studies of 41 programs and 405 effect sizes (Exhibit B.1 includes the list of programs included in the meta-regression). Studies of the additional 10 evidence-based programs not included in the merged data set had either missing effect size or standard error information and thus could not be included in the meta-regression.

| 2gether | Peer Group Connection–High School (PGC-HS) |
|-----------------------------------------------------------------|--------------------------------------------------------------------------------------|
| AIM 4 Teen Moms | Plan A |
| All4You! | Positive Potential |
| All4You2! | Positive Prevention PLUS |
| Be Proud! Be Responsible! | Possessing Your Power |
| Children's Aid Society (CAS) Carera Program | POWER Through Choices |
| Choosing the Best JOURNEY | Prime Time |
| Familias Unidas | Project IMAGE |
| Families Talking Together (FTT) | Promoting Health Among Teens! Abstinence-Only Intervention |
| Generations | Promoting Health Among Teens! Comprehensive Abstinence and Safer Sex Intervention |
| Get Real | Pulse |
| Girl2Girl | Reducing the Risk |
| Health Improvement Project for Teens (HIP Teens) | Safer Sex Intervention (SSI) |
| Healthy Futures | Seventeen Days (formerly What Could You Do?) |
| Heritage Keepers Abstinence Education | Sisters Saving Sisters |
| High School FLASH | STRIVE |
| IN clued: Inclusive Healthcare—Youth and Providers Empowered | Teen Options to Prevent Pregnancy (T.O.P.P.) |
| It's Your Game: Keep It Real (IYG) | Teen Outreach Program (TOP) |
| | |

Exhibit B.1. List of programs included in the meta-regression

HHS Office of Population Affairs



| LeadHer | Vision of You |
|-----------------------|---------------|
| Love Notes | Your Move |
| Making Proud Choices! | |

Exhibit B.2 provides an overview of the characteristics of the studies and the findings included in this meta-regression:

- About two-thirds of the findings were rated high. The remaining one-third were rated moderate. (Findings rated low are not deemed credible and therefore not reported on in the TPPER nor included in this meta-analysis).
- Most of the findings (72.1 percent) were full-sample analyses, while the remaining 27.9 percent were from TPPER-eligible subgroups (defined by sex [male/female] or sexual experience at baseline).
- The majority of findings were from studies that included youth of all sexes (57.8 percent). The next most common sample characteristic was young women only (38.3 percent).
- The most common findings were for outcomes related to sexual activity (38.0 percent) or contraceptive use (33.8 percent).
- Impact findings were most commonly examined between six months and 12 months after the end of the program (33.1 percent). They were examined much less often at 18 months or more after the end of the program (8.9 percent).
- Sexual health education programs were the most commonly examined (65.9 percent of all findings), and positive youth development programs were the next most common (13.6 percent of all findings).
- The overwhelming majority of the evidence (86.4 percent) was obtained in studies that conducted data collection within the past 15 years (since 2009). All studies included in the meta-analysis had data collection in 2004 or later, because TPPER has a 20-year study inclusion window.

| Characteristic | Number of studies | Percent of studies | Number of findings | Percent of findings |
|-----------------------------|----------------------|--------------------|-----------------------|------------------------|
| Study rating | | | | |
| High Quality | 35 | 62.5% | 273 | 67.4% |
| Moderate Quality | 21 | 37.5% | 132 | 32.6% |
| Sample ^a | | | | |
| Full sample | 50 | 89.3% | 292 | 72.1% |
| Subgroup | 21 | 37.5% | 113 | 27.9% |
| Sample characteristics | | | | |
| Young women only | 18 | 32.1% | 155 | 38.3% |
| Young men only | 0 | 0.0% | 0 | 0.0% |
| All sexes (male and female) | 37 | 66.1% | 234 | 57.8% |
| Other | 1 | 1.8% | 16 | 4.0% |

Exhibit B.2. Characteristics of studies and findings in the TPPER components meta-regression



| Office of | |
|-----------|-----------|
| Populatio | n Affairs |

| Characteristic | Number of studies | Percent of studies | Number of findings | Percent of findings | | | | | | |
|-------------------------------|----------------------|--------------------|-----------------------|---------------------|--|--|--|--|--|--|
| Outcome domain ^a | | | | | | | | | | |
| Contraceptive use | 37 | 66.1% | 137 | 33.8% | | | | | | |
| Number of sexual partners | 16 | 28.6% | 54 | 13.3% | | | | | | |
| Pregnancy | 13 | 23.2% | 40 | 9.9% | | | | | | |
| Sexual activity | 45 | 80.4% | 154 | 38.0% | | | | | | |
| STIs or HIV | 7 | 12.5% | 20 | 4.9% | | | | | | |
| Follow-up timing ^a | | | | | | | | | | |
| Short term (< 6 months) | 32 | 57.1% | 114 | 28.1% | | | | | | |
| Medium term (6–11.9 months) | 26 | 46.4% | 134 | 33.1% | | | | | | |
| Long term (12–17.9 months) | 26 | 46.4% | 121 | 29.9% | | | | | | |
| Very long term (18+ months) | 6 | 10.7% | 36 | 8.9% | | | | | | |
| Program focus | | | | | | | | | | |
| Clinic-based | 5 | 8.9% | 25 | 6.2% | | | | | | |
| Sexual health education | 31 | 55.4% | 267 | 65.9% | | | | | | |
| Positive youth development | 13 | 23.2% | 55 | 13.6% | | | | | | |
| Healthy relationships | 3 | 5.4% | 28 | 6.9% | | | | | | |
| Sexual risk avoidance | 5 | 8.9% | 30 | 7.4% | | | | | | |
| Data collection timing | | | | | | | | | | |
| Since 2009 | 50 | 89.3% | 350 | 86.4% | | | | | | |
| Between 2004 and 2009 | 6 | 10.7% | 55 | 13.6% | | | | | | |
| Total | 56 | | 405 | | | | | | | |

^a The number of studies for this category sums to greater than 56 (or greater than 100%) because several studies report findings in multiple categories.

References for all studies included in this analysis are available upon request.

B. Component data details

As noted previously, we received component-level data for 169 individual components across 51 TPP programs. Each component was coded into one of three categories: (1) not present, (2) present, or (3) present and core. The third category differentiates those components highlighted by the developers and distributors as very important to the program. For the analyses presented in this brief, we coarsened the fine-grained content components into seven categories: (1) social health, (2) emotional health, (3) sexuality, (4) sexual behavior, (5) individual values, (6) substance use, and (7) academic success:

- Academic success content addresses youth's options and plans for pathways to academic success.
- Emotional health content addresses intrapersonal processes and strengths.
- Individual values content addresses youth's personal identity and belief systems.
- **Sexual behavior content** includes content that addresses the physical behaviors related to sexual activity, its preconditions (such as puberty), and its potential consequences (such as pregnancy).



- **Sexuality content** addresses the nonphysical behaviors and experiences related to healthy sexual behavior, its preconditions (such as consent), and its potential consequences (such as healthy relationships).
- Social health content addresses interpersonal skills, relationships, and belief systems.
- Substance use content addresses the avoidance of, reduction of, and risks related to using substances.

To operationalize our analysis, we counted the number of fine-grained components that were found within a given content category. Specifically, we created the following versions of variables for each of the seven categories:

- Count of content components. We coded each content category predictor as a count variable. The count reflected the number of individual content components within the category that were selected as present in the evaluated version of the program. For example, within the sexual behavior category, which included 19 individual components, the variable was coded as 1 if only one component was present, 2 if two components were present, 3 if three components were present, and so on. We also created an indicator for each content category, which took on a value of 1 if the count was > 0 and of 0 otherwise.
- Count of core content components. We coded each core content category predictor as a count variable. The count reflected the number of individual content components within the category that were selected as present and core in the evaluated version of the program. We also created an indicator for each core content category, which again took on a value of 1 if the count was > 0 and of 0 otherwise.

Additionally, we created two other variables that provided insight across the content component categories.

- Content variety. We coded each content variety predictor as a count variable, where the count reflected the number of content categories represented in the count of content components variable. For example, if a program contained content in the academic success, emotional health, and individual values categories, it would receive a score of 3 for the content variety predictor.
- **Core content variety.** We coded each core content variety predictor as a count variable, where the count reflected the number of content categories represented in the count of core content components variable. If a program contained core content components in the emotional health, sexual behavior, sexuality, and substance use categories, it would receive a score of 4 in the core content variety predictor.

C. Statistical analyses

The TPPER meta-analysis provided an average estimate of impacts and allowed us to investigate differences in program impacts across a specific dimension of interest (Cole et al. 2024). Meta-regression, on the other hand, enables us to investigate potential drivers of variation in impacts. It builds on standard regression models, where an outcome variable (for example, an effect size representing a program's impact on sexual behavior) is analyzed in relation to one or more explanatory variables (for



example, program features or characteristics of the evaluation). However, there are key differences between regression and meta-regression. While regression analyzes outcomes from different individuals, meta-regression analyzes outcomes from different studies. In meta-regression, the outcome variable is the effect size and the explanatory variables are study characteristics that might influence the magnitude of that effect.

We employed a components-based meta-regression for the statistical analyses in this brief. In addition to the traditional strengths of meta-analysis—such as the ability to generalize across various research designs, sample characteristics, and operational definitions of variables (Cooper & Hedges, 1994)—a components-based approach aims to identify the specific program aspects or characteristics that predict significant reductions in sexual behavior outcomes. By linking components to effect sizes, our approach seeks to provide guidance about which ingredients of TPPER programs are associated with large and small effects.

1. Benchmark analyses

Our benchmark analytic approach examined all seven component category variables as predictors of TPPER effect sizes. In these analyses, we interpreted the beta for each variable as representing a oneunit increase in the observed effect size for each additional component within the category. We used the variables described in Section B and performed these analyses separately for both program components and core components within the content domain.

Our final benchmark analytic approach examined the variety predictor, which captured the range of content types within a single variable. This analysis was conducted separately for program components and core components.

These findings are presented in Appendix Exhibit C.1.

2. Sensitivity analyses

To understand the robustness of these findings to different analytic approaches, we conducted a number of sensitivity analyses. In one set of analyses that examined the content categories, instead of using count variables for each category, we used a binary indicator variable for each category that represented whether or not any components in that category were observed in a given program. In a second set of analyses that examined the content categories, instead of examining each category net of the other categories in a single model, we estimated bivariate relationships between each content category and the dependent variable. In a final set of analyses, we extended the benchmark analytic approach to include different covariate sets:

• **Program type.** Clinic-based, sexual health education, positive youth development, healthy relationships, or sexual risk avoidance. This covariate set was examined because Cole et al. (2024) noted that there were significant differences in effect sizes by program type.



• Study characteristics

- Outcome domain (contraceptive use, number of sexual partners, pregnancy, sexual activity, STIs, or HIV)
- Full sample or subgroup contrast
- Follow-up timing (short term, medium term, long term, and very long term)
- Study last data collection year (prior to 2009 or 2009 to 2023)

Selected results are presented in Appendix Exhibits C.2 to C.4.

3. Approach for reporting

Our method for highlighting a finding was designed to ensure that only the most robust results were emphasized. It emphasized statistically significant findings that were consistent across multiple specifications and validated through sensitivity analyses (Wasserstein & Lazar, 2016; Angrist & Pischke, 2009; Leamer, 1983). This methodology is tailored to exploratory studies, where the power to detect effects is limited and the risk of false positives is higher. In particular, the approach relies on three heuristic principles to determine the significance and reliability of the findings:

- 1. Benchmark analysis statistical significance. A finding is considered notable if the beta coefficient (the estimated effect size) has a *p*-value of less than 0.10 in the primary benchmark analysis. This threshold indicates that there is less than a 10 percent probability that the observed effect is due to random chance (under the assumption that there is no relationship between the component and the outcome), suggesting a potential underlying relationship.
- 2. Consistency across model specifications. The direction of the beta coefficient (positive or negative) must be consistent across all benchmark and sensitivity specifications. This consistency ensures that the observed effect is not an artifact of a particular model setup but rather a stable result that persists under different assumptions and analytical conditions.
- **3. Sensitivity analysis validation.** The beta coefficient must also achieve a *p*-value of less than 0.15 in at least one of the sensitivity analyses. Sensitivity analyses are conducted to test the robustness of the findings under various assumptions and alternative scenarios. This step verifies that the finding holds up when tested against different conditions.

By ensuring that highlighted findings meet these criteria, we increase the likelihood that these results are reliable and not due to chance or model-specific quirks.



Appendix B References

- Angrist, J. D., & Pischke, J. S. (2009). *Mostly harmless econometrics: An empiricist's companion*. Princeton University Press.
- Cole, R., Lugo-Gil, J., & Streke, A. (2024). *The effectiveness of teen pregnancy prevention programs—a metaanalysis*. Office of the Assistant Secretary for Planning and Evaluation, Office of Human Services Policy, U.S. Department of Health and Human Services.
- Cooper, H. M., & Hedges, L.V. (Eds.). (1994). The handbook of research synthesis. Russell Sage Foundation.
- Forrester, E., D. Aharpour, R. Cole, and J. Knab. (2024). Core Components of Evidence-Based Teen Pregnancy Prevention Programs. Washington, DC: Office of the Assistant Secretary for Planning and Evaluation, Office of Human Services Policy, U.S. Department of Health and Human Services.
- Forrester, E., & Cole, R. (2023a). *Core components of teen pregnancy prevention programs*. Office of Population Affairs, U.S. Department of Health and Human Services.
- Forrester, E., & Cole, R. (2023b). *Core component checklist tool*. Office of Population Affairs, U.S. Department of Health and Human Services.
- Learmer, E. E. (1983). Let's take the con out of econometrics. The American Economic Review, 73(1), 31-43.
- Streke, A., Denk, E., Lugo-Gil, J., & Cole, R. (2024). Meta-analysis report of Teen Pregnancy Prevention Evidence Review (TPPER) studies: Technical appendices. Assistant Secretary for Planning and Evaluation, Office of Human Services Policy, U.S. Department of Health and Human Services.
- Wasserstein, R. L., & Lazar, N. A. (2016). The ASA's statement on p-values: Context, process, and purpose. *The American Statistician*, *70*(2), 129–133.



Appendix C: Supplemental Materials



| Exhibit C.1. | Main | benchmark | analyses: | Parameter | estimates f | or program | ns with o | r without s | specific |
|--------------|------|-----------|-----------|-----------|-------------|------------|-----------|-------------|----------|
| components | 5 | | | | | | | | |

| | Parameter | | 95 percent confidence interval | 95 percent confidence interval | | |
|---------------------------|-----------------------|----------|--------------------------------------|--------------------------------------|---------|---------|
| Variables | estimates (β) | Standard | lower | upper bound | n-value | Tau- |
| Content component categor | ту У | chor | bound | bound | p-value | Squarea |
| Constant | 0.252** | 0.095 | 0.032 | 0.473 | 0.030 | |
| Sexual behavior | -0.013 | 0.008 | -0.031 | 0.005 | 0.135 | |
| Sexuality | 0.023 | 0.016 | -0.014 | 0.059 | 0.194 | |
| Emotional health | 0.004 | 0.011 | -0.022 | 0.031 | 0.704 | |
| Academic success | -0.083** | 0.034 | -0.161 | -0.005 | 0.041 | |
| Substance use | 0.048* | 0.023 | -0.005 | 0.100 | 0.070 | |
| Social health | -0.006 | 0.012 | -0.033 | 0.021 | 0.612 | |
| Individual values | -0.005 | 0.027 | -0.067 | 0.058 | 0.872 | 0.030 |
| Content core component ca | tegory | | | | | |
| Constant | 0.265** | 0.073 | 0.105 | 0.424 | 0.004 | |
| Sexual behavior | -0.014* | 0.007 | -0.029 | 0.000 | 0.055 | |
| Sexuality | -0.007 | 0.013 | -0.036 | 0.022 | 0.606 | |
| Emotional health | 0.002 | 0.013 | -0.026 | 0.031 | 0.856 | |
| Academic success | -0.080** | 0.029 | -0.144 | -0.016 | 0.018 | |
| Substance use | 0.055** | 0.020 | 0.012 | 0.099 | 0.017 | |
| Social health | 0.012 | 0.015 | -0.020 | 0.045 | 0.432 | |
| Individual values | -0.029 | 0.034 | -0.102 | 0.045 | 0.410 | 0.030 |
| Variety predictors | | | | | | |
| Content variety | -0.026 | 0.023 | -0.074 | 0.023 | 0.274 | 0.025 |
| Core content variety | -0.043* | 0.021 | -0.093 | 0.008 | 0.084 | 0.024 |

Source: TPPER database.

Note: To ensure consistency and interpretability in the meta-regression results, all parameter estimates (betas) are coded so that positive values indicate a favorable treatment effect.



Exhibit C.2. Sensitivity analyses: Content component category

| | Sensitivity A | | ty A Sensitivity B Se | | Sensit | ivity C | Sensitivity D | | Sensitivity E | |
|-------------------|-------------------------------|-----------------|---------------------------------|-----------------|-------------------------------|-----------------|-------------------------------|-----------------|-------------------------------|-----------------|
| Variables | Parameter estimates (eta) | <i>p</i> -value | Parameter estimates (β) | <i>p</i> -value | Parameter estimates (eta) | <i>p</i> -value | Parameter estimates (eta) | <i>p</i> -value | Parameter estimates (eta) | <i>p</i> -value |
| Sexual behavior | -0.010 | 0.266 | 0.061 | 0.276 | -0.049 | 0.410 | -0.012** | 0.046 | -0.013 | 0.144 |
| Sexuality | 0.002 | 0.872 | -0.137 | 0.324 | 0.181 | 0.562 | 0.032* | 0.061 | 0.027 | 0.164 |
| Emotional health | -0.002 | 0.810 | -0.139 | 0.477 | -0.138 | 0.356 | -0.006 | 0.572 | 0.005 | 0.636 |
| Academic success | -0.051 | 0.115 | -0.090* | 0.081 | -0.137 | 0.237 | -0.065* | 0.050 | -0.071* | 0.048 |
| Substance use | 0.004 | 0.896 | 0.074 | 0.361 | 0.121 | 0.324 | 0.038 | 0.110 | 0.034 | 0.130 |
| Social health | -0.002 | 0.800 | -0.350 | 0.223 | -0.540 | 0.177 | 0.002 | 0.850 | -0.008 | 0.631 |
| Individual values | -0.012 | 0.596 | -0.028 | 0.581 | 0.057 | 0.387 | 0.000 | 0.998 | -0.010 | 0.750 |

| | Sensitivity A | Sensitivity B | Sensitivity C | Sensitivity D | Sensitivity E |
|--------------------------------|---------------------|---------------------|-------------------|-------------------|-------------------|
| Coding type | Count | Binary | Binary | Count | Count |
| Component analytic approach | Analyzed separately | Analyzed separately | All in same model | All in same model | All in same model |
| Covariates | None | None | None | Program type | Other covariates |

Source: TPPER database.

Note: To ensure consistency and interpretability in the meta-regression results, all parameter estimates (betas) are coded so that positive values indicate a favorable treatment effect.



Exhibit C.3. Sensitivity analyses: Content core component category

| | Sensitivity A | | Sensitivity A Sensitivity B | | Sensit | Sensitivity C | | ivity D | Sensitivity E | |
|-------------------|-------------------------------|-----------------|-------------------------------|---------|---------------------------------|---------------|-------------------------------|-----------------|-------------------------------|---------|
| Variables | Parameter estimates (eta) | <i>p</i> -value | Parameter estimates (eta) | p-value | Parameter estimates (β) | p-value | Parameter estimates (eta) | <i>p</i> -value | Parameter estimates (eta) | p-value |
| Sexual behavior | -0.012 | 0.111 | -0.024 | 0.769 | 0.111 | 0.572 | -0.016** | 0.007 | -0.013* | 0.069 |
| Sexuality | -0.016 | 0.178 | -0.198** | 0.047 | -0.210 | 0.159 | 0.007 | 0.588 | -0.005 | 0.753 |
| Emotional health | -0.019* | 0.096 | -0.163 | 0.303 | -0.038 | 0.867 | -0.002 | 0.809 | 0.001 | 0.931 |
| Academic success | -0.047 | 0.171 | -0.074 | 0.349 | 0.030 | 0.802 | -0.081** | 0.010 | -0.063** | 0.045 |
| Substance use | -0.006 | 0.864 | -0.049 | 0.683 | -0.062 | 0.689 | 0.054** | 0.017 | 0.039* | 0.088 |
| Social health | -0.007 | 0.384 | -0.156 | 0.104 | 0.009 | 0.931 | 0.018 | 0.151 | 0.012 | 0.511 |
| Individual values | -0.048 | 0.157 | -0.103** | 0.040 | -0.071 | 0.301 | -0.016 | 0.642 | -0.037 | 0.355 |

| | Sensitivity A | Sensitivity B | Sensitivity C | Sensitivity D | Sensitivity E |
|--------------------------------|---------------------|---------------------|-------------------|-------------------|-------------------|
| Coding type | Count | Binary | Binary | Count | Count |
| Component analytic approach | Analyzed separately | Analyzed separately | All in same model | All in same model | All in same model |
| Covariates | None | None | None | Program type | Other covariates |

Source: TPPER database.

Note: To ensure consistency and interpretability in the meta-regression results, all parameter estimates (betas) are coded so that positive values indicate a favorable treatment effect.



Exhibit C.4. Sensitivity analyses: Variety predictors

| | Sensit | ivity D | Sensitivity E | | |
|----------------------|-------------------------------|-----------------|-------------------------------|-----------------|--|
| Variables | Parameter estimates (eta) | <i>p</i> -value | Parameter estimates (eta) | <i>p</i> -value | |
| Content variety | 0.016 | 0.520 | -0.024 | 0.259 | |
| Core content variety | -0.018 | 0.293 | -0.044* | 0.051 | |

| | Sensitivity D | Sensitivity E |
|-----------------------------|-------------------|-------------------|
| Coding type | Count | Count |
| Component analytic approach | All in same model | All in same model |
| Covariates | Program type | Other covariates |

Source: TPPER database.

Note: To ensure consistency and interpretability in the meta-regression results, all parameter estimates (betas) are coded so that positive values indicate a favorable treatment effect.