

# Associations Between Exposures and Education Outcomes

| Outcome  | Specific Outcome      | Exposure  | Age Group | Pop.         | Study Design     | Lead Author, Date      | r with 95% CI        | I <sup>2</sup> | K  | N      |  |
|----------|-----------------------|---|-----------|--------------|------------------|------------------------|----------------------|----------------|----|--------|--|
| Learning | General               | TV programs and movies: General                           | Mixed     | General      | Cross-sectional  | Adelantado-Renau, 2019 | -0.10 [-0.15, -0.04] | 98%            | 18 | 62,135 |  |
|          | General               | TV programs and movies: General                           | Mixed     | General      | Mixed or unclear | Williams, 1982         | -0.09 [-0.13, -0.04] | 96%            | 23 | 86,507 |  |
|          | General               | Video games: Educational (with instructional support)     | Children  | General      | Experimental     | Wouters, 2013          | 0.15 [0.05, 0.25]    | 66%            | 16 | 1,287  |  |
|          | General               | Video games: General                                      | Mixed     | General      | Cross-sectional  | Adelantado-Renau, 2019 | -0.08 [-0.12, -0.04] | 40%            | 10 | 4,276  |  |
|          | General               | e-Books: Narration  | Mixed     | General      | Experimental     | Takacs, 2014           | 0.11 [0.05, 0.17]    | 56%            | 50 | 2,288  |  |
|          | Literacy and numeracy | Screen use: Educational apps                              | Young     | General      | Experimental     | Kim, 2021              | 0.11 [0.07, 0.16]    | 0%             | 15 | 2,011  |  |
|          | Motivation            | Video games: Educational                                  | Children  | General      | Experimental     | Wouters, 2013          | 0.16 [0.02, 0.31]    | 84%            | 10 | 1,183  |  |
|          | Motivation            | Video games: Educational (with competition)               | Children  | General      | Mixed or unclear | Arztmann, 2022         | 0.26 [0.17, 0.35]    | 82%            | 15 | 9,318  |  |
|          | General               | Screen use: General                                       | Mixed     | General      | Cross-sectional  | Adelantado-Renau, 2019 | -0.11 [-0.24, 0.01]  | 98%            | 18 | 13,100 |  |
|          | General               | Screen-based intervention: Augmented reality (in schools) | Mixed     | General      | Mixed or unclear | Tekedere, 2016         | 0.33 [0.25, 0.42]    | 68%            | 15 | 1,474  |  |
|          | General               | Screen-based intervention: Education (via touch screen)   | Young     | General      | Experimental     | Xie, 2018              | 0.21 [0.15, 0.28]    | 86%            | 79 | 5,810  |  |
|          | General               | Screen-based intervention: Literacy (Abracadabra)         | Mixed     | General      | Experimental     | Major, 2021            | 0.09 [0.06, 0.12]    | 90%            | 15 | 52,377 |  |
| Literacy | General               | Screen use: Educational apps                              | Children  | General      | Experimental     | Kim, 2021              | 0.12 [0.06, 0.18]    | 0%             | 12 | 1,095  |  |
|          | General               | Screen use: General                                       | Mixed     | General      | Observational    | Madigan, 2020          | -0.14 [-0.20, -0.09] | 90%            | 38 | 18,318 |  |
|          | General               | Screen use: General (covieving)                           | Mixed     | General      | Observational    | Madigan, 2020          | 0.15 [0.02, 0.28]    | 96%            | 12 | 6,083  |  |
|          | General               | TV programs and movies: Educational                       | Mixed     | General      | Observational    | Madigan, 2020          | 0.13 [0.03, 0.23]    | 82%            | 13 | 1,955  |  |
|          | Phonics               | Screen-based intervention: Literacy (Abracadabra)         | Children  | General      | Experimental     | Abrami, 2020           | 0.09 [0.01, 0.17]    | 82%            | 11 | 4,954  |  |
|          | Reading               | Screen-based intervention: Reading (technology supported) | Children  | Poor readers | Experimental     | Neitzel, 2022          | 0.04 [0.01, 0.06]    | 0%             | 27 | 5,736  |  |
|          | Reading comprehension | e-Books: General  | Young     | General      | Experimental     | Furenes, 2021          | -0.02 [-0.08, 0.03]  | 0%             | 26 | 1,192  |  |
| Numeracy | General               | Screen-based intervention: Mathematics                    | Mixed     | General      | Experimental     | Li, 2010               | 0.27 [0.21, 0.33]    | 98%            | 85 | 36,793 |  |
|          | General               | Video games: Numeracy                                     | Mixed     | General      | Mixed or unclear | Byun, 2018             | 0.32 [0.21, 0.43]    | 88%            | 25 | 2,008  |  |
|          | Mathematics           | Video games: Educational                                  | Mixed     | General      | Experimental     | Tokac, 2019            | 0.06 [0.00, 0.12]    | 84%            | 39 | 6,557  |  |

-0.2 0.0 0.2 0.4  
r with 95% and 99.9% CIs