

PubMed Search Strategy

((infant[MeSH Terms] OR child[MeSH Terms] OR minors[MeSH Terms] OR school age population[MeSH Terms] OR pediatrics[MeSH Terms] OR adolescen*[MeSH Terms]) **OR** (boy*[Title/Abstract] OR child*[Title/Abstract] OR girl*[Title/Abstract] OR kindergarten[Title/Abstract] OR paediatric[Title/Abstract] OR pediatric[Title/Abstract] OR infan* OR baby[Title/Abstract] OR babies[Title/Abstract] OR toddler*[Title/Abstract] OR "young child*" [Title/Abstract] OR "early childhood" [Title/Abstract] OR "early years" [Title/Abstract] OR pre-school*[Title/Abstract] OR preschool*[Title/Abstract] OR "pre school*" [Title/Abstract] OR "school age*" [Title/Abstract] OR school-age*[Title/Abstract] OR youth*[Title/Abstract] OR adolescen*[Title/Abstract] OR "young pe*" [Title/Abstract] OR teen*[Title/Abstract] OR preadolescen*[Title/Abstract])) **AND** ((television[MeSH Terms] OR computers[MeSH Terms] OR video games[MeSH Terms] OR sedentary lifestyle[MeSH Terms] OR smartphone[MeSH Terms] OR cell phones[MeSH Terms] OR computers, handheld[MeSH Terms]) **OR** (Television[Title/Abstract] OR TV[Title/Abstract] OR "Screen viewing" [Title/Abstract] OR "Screen time" [Title/Abstract] OR "Screen exposure" [Title/Abstract] OR Computer*[Title/Abstract] OR "Video gam*" [Title/Abstract] OR Sedentary[Title/Abstract] OR Inactivity[Title/Abstract] OR "E gam*" [Title/Abstract] OR e-gam*[Title/Abstract] OR Tablet*[Title/Abstract] OR "Cell phone*" [Title/Abstract] OR "Mobile Phone*" [Title/Abstract] OR "Mobile us*" [Title/Abstract] OR "Media time" [Title/Abstract] OR "Media us*" [Title/Abstract] OR "handheld device*" [Title/Abstract] OR "game device*" [Title/Abstract] OR "gaming device*" [Title/Abstract] OR "game console*" [Title/Abstract] OR "gaming console*" [Title/Abstract] OR "electronic media" [Title/Abstract] OR smartphone*[Title/Abstract] OR "smart phone*" [Title/Abstract])) **AND** ((Review[Title] OR meta-analysis[Title] OR meta-regression[Title] OR synthesis [Title] OR meta-synthesis[Title] OR "meta analysis" [Title] OR "meta regression" [Title] OR "meta synthesis" [Title]) **OR** (Review[Publication Type] OR Meta-Analysis[Publication Type])))

Version 1= Above

Version 2 = delete terms following final "AND", limit results "Review" after search

MEDLINE Search Strategy

(MH ("child" OR "minors" OR Infant OR "school age population" OR "pediatrics" OR "Adolescen*") **OR** TI (boy* OR girl* OR kindergarten OR paediatric OR pediatric OR infan* OR baby OR babies OR toddler* OR "young child*" OR child* OR "early childhood" OR "early years" OR pre-school* OR preschool* OR "pre school*" OR "school age*" OR school-age* OR adolescen* OR youth* OR "young pe*" OR teen* OR preadolescen*) **OR** AB (boy* OR girl* OR kindergarten OR paediatric OR pediatric OR infan* OR baby OR babies OR toddler* OR "young child*" OR child* OR "early childhood" OR "early years" OR pre-school* OR preschool* OR "pre school*" OR "school age*" OR school-age* OR adolescen* OR youth* OR "young pe*" OR teen* OR preadolescen*)) **AND** (MH ("television" OR "computers" OR "video games" OR "sedentary lifestyle" OR "smartphone" OR "cell phones" OR "computers, handheld") **OR** TI (Television OR TV OR "Screen viewing" OR Screen time OR Screen exposure OR Computer* OR Video gam* OR

Sedentary OR Inactivity OR "E gam*" OR e-gam* OR Tablet* OR "Cell phone*" OR "Mobile Phone*" OR "Mobile us**" OR "Media time" OR "Media us**" OR "handheld device**" OR "game device**" OR "gaming device**" OR "game console**" OR "gaming console**" OR "electronic media" OR smartphone* OR "smart phone**") **OR AB** (Television OR TV OR "Screen viewing" OR Screen time OR Screen exposure OR Computer* OR Video gam* OR Sedentary OR Inactivity OR "E gam*" OR e-gam* OR Tablet* OR "Cell phone*" OR "Mobile Phone*" OR "Mobile us**" OR "Media time" OR "Media us**" OR "handheld device**" OR "game device**" OR "gaming device**" OR "game console**" OR "gaming console**" OR "electronic media" OR smartphone* OR "smart phone**")) **AND** (TI (Review OR meta-analysis OR "meta analysis" OR meta-regression OR "meta regression" OR synthesis OR meta-synthesis OR "meta synthesis"))

Version 1 = above

Version 2 = delete terms following final "AND". Restrict results to review articles.

CINAHL Search Strategy

((MH ("child" OR "Minors (Legal)" OR "pediatrics" OR "Infant")) **OR** TI ("boy*" OR "child*" OR "girl*" OR "kindergarten" OR "paediatric" OR "pediatric" OR "infan*" OR "baby" OR "babies" OR "toddler*" OR "young child**" OR "early childhood" OR "early years" OR "pre-school**" OR "preschool*" OR "pre school*" OR "school age**" OR "school-age**" OR "adolescen**" OR "youth*" OR "young pe*" OR teen* OR "preadolescen**") **OR AB** ("boy*" OR "child*" OR "girl*" OR "kindergarten" OR "paediatric" OR "pediatric" OR "infan*" OR "baby" OR "babies" OR "toddler*" OR "young child**" OR "early childhood" OR "early years" OR "pre-school**" OR "preschool*" OR "pre school*" OR "school age**" OR "school-age**" OR "adolescen**" OR "youth*" OR "young pe*" OR teen* OR "preadolescen**")) **AND** (MH ("television" OR "computers" OR "video games" OR "lifestyle, sedentary" OR "smartphone" OR "cellular phone" OR "computers, hand-held") **OR** TI ("Television" OR "TV" OR "Screen viewing" OR "Screen time" OR "Screen exposure" OR "Computer*" OR "Video gam*" OR "Sedentary" OR "Inactivity" OR "E gam*" OR "e-gam*" OR "Tablet**" OR "Cell phone*" OR "Mobile Phone*" OR "Mobile us*" OR "Media time" OR "Media us*" OR "handheld device**" OR "game device**" OR "gaming device**" OR "game console**" OR "gaming console**" OR "electronic media" OR "smartphone**" OR "smart phone**") **OR AB** ("Television" OR "TV" OR "Screen viewing" OR "Screen time" OR "Screen exposure" OR "Computer**" OR "Video gam*" OR "Sedentary" OR "Inactivity" OR "E gam*" OR "e-gam**" OR "Tablet**" OR "Cell phone**" OR "Mobile Phone**" OR "Mobile us**" OR "Media time" OR "Media us**" OR "handheld device**" OR "game device**" OR "gaming device**" OR "game console**" OR "gaming console**" OR "electronic media" OR "smartphone**" OR "smart phone**")) **AND** (TI("Review" OR "meta-analysis" OR "meta analysis" OR "meta-regression" OR "meta regression" OR "synthesis" OR "meta-synthesis" OR "meta synthesis"))

PsycINFO Search Strategy

((MA("pediatrics")) **OR** (TI (boy* OR girl* OR kindergarten OR paediatric OR pediatric OR infan* OR baby OR babies OR toddler* OR "young child**" OR child* OR "early childhood" OR "early years" OR

pre-school* OR preschool* OR pre school* OR school age* OR school-age* OR adolescen* OR youth* OR young pe* OR teen* OR preadolescen*)) **OR** (AB (boy* OR girl* OR kindergarten OR paediatric OR pediatric OR infan* OR baby OR babies OR toddler* OR "young child**" OR child* OR "early childhood" OR "early years" OR pre-school* OR preschool* OR pre school* OR school age* OR school-age* OR adolescen* OR youth* OR young pe* OR teen* OR preadolescen*)) **OR** (KW (boy* OR OR girl* OR kindergarten OR paediatric OR pediatric OR infan* OR baby OR babies OR toddler* OR "young child**" OR child* OR "early childhood" OR "early years" OR pre-school* OR preschool* OR pre school* OR school age* OR school-age* OR adolescen* OR youth* OR young pe* OR teen* OR preadolescen*)) **AND** ((MA("Television" OR "Television Viewing" OR "Screen Time" OR "Mobile Devices" OR "Sedentary behavior" OR "computers" OR "computer games" OR "cellular phones")) **OR** (TI(Television OR TV OR Screen viewing OR Screen time OR Screen exposure OR Computer* OR Video gam* OR Sedentary OR Inactivity OR E gam* OR e-gam* OR Tablet* OR Cell phone* OR Mobile Phone* OR Mobile us* OR Media time OR Media us* OR handheld device* OR game device* OR gaming device* OR game console* OR gaming console* OR electronic media OR smartphone* OR smart phone*)) **OR** (AB(Television OR TV OR Screen viewing OR Screen time OR Screen exposure OR Computer* OR Video gam* OR Sedentary OR Inactivity OR E gam* OR e-gam* OR Tablet* OR Cell phone* OR Mobile Phone* OR Mobile us* OR Media time OR Media us* OR handheld device* OR game device* OR gaming device* OR game console* OR gaming console* OR electronic media OR smartphone* OR smart phone*)) **OR** (KW(Television OR TV OR Screen viewing OR Screen time OR Screen exposure OR Computer* OR Video gam* OR Sedentary OR Inactivity OR E gam* OR e-gam* OR Tablet* OR Cell phone* OR Mobile Phone* OR Mobile us* OR Media time OR Media us* OR handheld device* OR game device* OR gaming device* OR game console* OR gaming console* OR electronic media OR smartphone* OR smart phone*)) **AND** (TI(Review OR systematic review OR meta-analysis OR meta-regression OR synthesis OR meta-synthesis OR "meta analysis" OR "meta regression" OR "meta synthesis")))

SPORTDiscus search strategy

((SU ("infant" OR "children" OR "school children" OR "pediatrics" OR "youth" OR "teenagers**"))**OR** (TI (boy* OR girl* OR kindergarten OR paediatric OR pediatric OR infan* OR baby OR babies OR toddler* OR "young child**" OR child* OR "early childhood" OR "early years" OR pre-school* OR preschool* OR pre school* OR school age* OR school-age* OR adolescen* OR youth* OR young pe* OR teen* OR preadolescen*)) **OR** (AB (boy* OR girl* OR kindergarten OR paediatric OR pediatric OR infan* OR baby OR babies OR toddler* OR "young child**" OR child* OR "early childhood" OR "early years" OR pre-school* OR preschool* OR pre school* OR school age* OR school-age* OR adolescen* OR youth* OR young pe* OR teen* OR preadolescen*)) **OR** (KW (boy* OR girl* OR kindergarten OR paediatric OR pediatric OR infan* OR baby OR babies OR toddler* OR "young child**" OR child* OR "early childhood" OR "early years" OR pre-school* OR preschool* OR pre school* OR school age* OR school-age* OR adolescen* OR youth* OR young pe* OR teen* OR preadolescen*)) **AND** ((SU ("Video games" OR "SEDENTARY behavior in children" OR "SEDENTARY lifestyles" OR "COMPUTER games")) **OR** (TI (Television OR TV OR Screen viewing OR Screen time OR Screen exposure OR Computer* OR Video gam* OR Sedentary OR Inactivity OR E gam* OR e-gam* OR Tablet* OR Cell phone* OR Mobile Phone* OR Mobile us* OR Media time OR Media us* OR handheld device* OR game device* OR gaming device* OR

game console* OR gaming console* OR electronic media OR smartphone* OR smart phone*)) **OR** (AB (Television OR TV OR Screen viewing OR Screen time OR Screen exposure OR Computer* OR Video gam* OR Sedentary OR Inactivity OR E gam* OR e-gam* OR Tablet* OR Cell phone* OR Mobile Phone* OR Mobile us* OR Media time OR Media us* OR handheld device* OR game device* OR gaming device* OR game console* OR gaming console* OR electronic media OR smartphone* OR smart phone*)) **OR** (KW (Television OR TV OR Screen viewing OR Screen time OR Screen exposure OR Computer* OR Video gam* OR Sedentary OR Inactivity OR E gam* OR e-gam* OR Tablet* OR Cell phone* OR Mobile Phone* OR Mobile us* OR Media time OR Media us* OR handheld device* OR game device* OR gaming device* OR game console* OR gaming console* OR electronic media OR smartphone* OR smart phone*)) **AND** (TI(Review OR Systematic review OR meta-analysis OR meta-regression OR synthesis OR meta-synthesis OR meta analysis OR meta regression OR meta synthesis))

Education Source Search Strategy

((SU (Children OR Youth OR adolescence)) **OR** (TI (boy* OR child* OR girl* OR kindergarten OR paediatric OR pediatric OR infan* OR baby OR babies OR toddler* OR "young child*" OR child* OR "early childhood" OR "early years" OR pre-school* OR preschool* OR "pre school*" OR "school age*" OR "school-age*" OR adolescen* OR youth* OR "young pe*" OR teen* OR preadolescen*))) **OR** (AB (boy* OR child* OR girl* OR kindergarten OR paediatric OR pediatric OR infan* OR baby OR babies OR toddler* OR "young child*" OR child* OR "early childhood" OR "early years" OR pre-school* OR preschool* OR "pre school*" OR "school age*" OR "school-age*" OR adolescen* OR youth* OR "young pe*" OR teen* OR preadolescen*))) **OR** (KW (boy* OR child* OR girl* OR kindergarten OR paediatric OR pediatric OR infan* OR baby OR babies OR toddler* OR "young child*" OR child* OR "early childhood" OR "early years" OR pre-school* OR preschool* OR "pre school*" OR "school age*" OR "school-age*" OR adolescen* OR youth* OR "young pe*" OR teen* OR preadolescen*))) **AND** ((SU (computers OR video games)) **OR** (TI (Television OR TV OR "Screen viewing" OR "Screen time" OR "Screen exposure" OR Computer* OR "Video gam*" OR Sedentary OR Inactivity OR "E gam*" OR "e-gam*" OR Tablet* OR "Cell phone*" OR "Mobile Phone*" OR "Mobile us*" OR "Media time" OR "Media us*" OR "handheld device*" OR "game device*" OR "gaming device*" OR "game console*" OR "gaming console*" OR "electronic media" OR smartphone* OR "smart phone*")) **OR** (AB (Television OR TV OR "Screen viewing" OR "Screen time" OR "Screen exposure" OR Computer* OR "Video gam*" OR Sedentary OR Inactivity OR "E gam*" OR "e-gam*" OR Tablet* OR "Cell phone*" OR "Mobile Phone*" OR "Mobile us*" OR "Media time" OR "Media us*" OR "handheld device*" OR "game device*" OR "gaming device*" OR "game console*" OR "gaming console*" OR "electronic media" OR smartphone* OR "smart phone*")) **OR** (KW (Television OR TV OR "Screen viewing" OR "Screen time" OR "Screen exposure" OR Computer* OR "Video gam*" OR Sedentary OR Inactivity OR "E gam*" OR "e-gam*" OR Tablet* OR "Cell phone*" OR "Mobile Phone*" OR "Mobile us*" OR "Media time" OR "Media us*" OR "handheld device*" OR "game device*" OR "gaming device*" OR "game console*" OR "gaming console*" OR "electronic media" OR smartphone* OR "smart phone*"))) **AND** (TI(Review OR "meta-analysis" OR "meta analysis" OR "meta-regression" OR "meta regression" OR synthesis OR "meta-synthesis" OR "meta synthesis"))

Version 1= as above

Version 2 = delete terms following final "AND", limit results "Review" after search

Embase Search Strategy

(child or pediatrics or adolescent or "minor (person)").sh. **OR** (boy* or girl* or kindergarten or paediatric or pediatric or infan* or baby or babies or toddler* or young child* or child or early childhood or early

years or pre-school* or preschool* or pre school* or school age* or school-age* or adolescen* or youth* or young pe* or teen* or preadolescen*).ti,ab,kw.

AND

(television or computer or video game or sedentary lifestyle or smartphone or mobile phone or television viewing).sh. **OR** (Television or TV or Screen viewing or Screen time or Screen exposure or Computer* or Video gam* or Sedentary or Inactivity or E gam* or e-gam* or Tablet* or Cell phone* or Mobile Phone* or Mobile us* or Media time or Media us* or handheld device* or game device* or gaming device* or game console* or gaming console* or electronic media or smartphone* or smart phone*).ti,ab,kw.

AND

(Review or meta?analysis or meta?regression or synthesis or meta?synthesis).ti. **OR** (review).pt.

Note: Run each block of searches separately and then combine with AND afterwards. A single, combined search generates an error message.

Cochrane Search Strategy

((minor* OR "school age population" OR boy* OR child* OR girl* OR kindergarten OR paediatric OR pediatric OR infan* OR baby OR babies OR "young child*" OR "early childhood" OR "early years" OR pre-school* OR preschool* OR pre school* OR school age* OR school-age* OR toddler* OR adolescen* OR youth* OR young pe* OR teen* OR preadolescen*):ti,ab,kw **OR** MESH(child OR minors OR school age population OR pediatrics OR adolescent)) **AND** ((television OR computers OR "video games" OR "sedentary lifestyle" OR smartphone OR "cell phones" OR TV OR "Screen viewing" OR "Screen time" OR "Screen exposure" OR Computer* OR "Video gam*" OR "Sedentary" OR Inactivity OR "E gam*" OR e-gam* OR Tablet* OR "Cell phone*" OR "Mobile Phone*" OR "Mobile us*" OR "Media time" OR "Media us*" OR "handheld device*" OR "game device*" OR "gaming device*" OR "game console*" OR "gaming console*" OR "electronic media" OR smartphone* OR "smart phone*"):ti,ab,kw **OR** MESH (television OR computers OR video games OR sedentary lifestyle OR smartphone OR cell phones OR computers, handheld)) **AND** ((Review OR "meta analysis" OR "meta regression" OR synthesis OR "meta synthesis"):ti)

Version 1: as above

Version 2: Delete terms after final 'AND' and restrict results to reviews using Cochrane's tagging of studies.

Scopus Search Strategy

Version 1:

(TITLE-ABS-KEY(minor* OR "school age population" OR boy* OR girl* OR kindergarten OR paediatric OR pediatric OR infan* OR baby OR babies OR toddler* OR "young child*" OR child* OR "early childhood" OR "early years" OR pre-school* OR preschool* OR pre school* OR school age* OR "school-age*" OR adolescen* OR youth* OR "young pe*" OR teen* OR preadolescen*)) **AND** (TITLE-ABS-KEY(television OR computers OR "video games" OR "sedentary lifestyle" OR smartphone OR "cell phones" OR TV OR "Screen viewing" OR "Screen time" OR "Screen exposure" OR Computer* OR "Video gam*" OR "Sedentary" OR Inactivity OR "E gam*" OR e-gam* OR Tablet* OR "Cell phone*" OR "Mobile Phone*" OR "Mobile us*" OR "Media time" OR "Media us*" OR "handheld device*" OR "game device*" OR "gaming device*" OR "game console*" OR "gaming console*" OR "electronic media" OR smartphone* OR "smart phone*")) **AND** (TITLE(Review OR "meta analysis" OR "meta-analysis" OR "meta-regression" OR "meta regression" OR synthesis OR "meta synthesis" OR "meta-synthesis"))

Version 2:

(TITLE-ABS-KEY (minor* OR "school age population" OR boy* OR girl* OR kindergarten OR paediatric OR pediatric OR infan* OR baby OR babies OR toddler* OR "young child*" OR child* OR "early childhood" OR "early years" OR pre-school* OR preschool* OR pre AND school* OR school AND age* OR "school-age*" OR adolescen* OR youth* OR "young pe*" OR teen* OR preadolescen*)) **AND** (TITLE-ABS-KEY (television OR computers OR "video games" OR "sedentary lifestyle" OR smartphone OR "cell phones" OR tv OR "Screen viewing" OR "Screen time" OR "Screen exposure" OR computer* OR "Video gam*" OR "Sedentary" OR inactivity OR "E gam*" OR e-gam* OR tablet* OR "Cell phone*" OR "Mobile Phone*" OR "Mobile us*" OR "Media time" OR "Media us*" OR "handheld device*" OR "game device*" OR "gaming device*" OR "game console*" OR "gaming console*" OR "electronic media" OR smartphone* OR "smart phone*")) **AND** (LIMIT-TO (DOCTYPE , "re"))

Web of Science Search Strategy

(TS= ("boy*" OR "girl*" OR "kindergarten" OR "paediatric" OR "pediatric" OR "infan*" OR "baby" OR "babies" OR "toddler*" OR "young child*" OR "child*" OR "early childhood" OR "early years" OR "pre-school*" OR "preschool*" OR "pre school*" OR "school age*" OR "school-age*" OR "adolescen*" OR "youth*" OR "young pe*" OR "teen*" OR "pre#adolescen*") **AND** (TS= ("Television" OR "TV" OR "Screen viewing" OR "Screen time" OR "Screen exposure" OR "Computer*" OR "Video gam*" OR "Sedentary" OR "Inactivity" OR "E gam*" OR "e-gam*" OR "Tablet*" OR "Cell phone*" OR "Mobile Phone*" OR "Mobile us*" OR "Media time" OR "Media us*" OR "handheld device*" OR "game device*" OR "gaming device*" OR "game console*" OR "gaming console*" OR "electronic media" OR "smartphone*" OR "smart phone*")) **AND** (TI= ("Review" OR "systematic review" OR "meta-analysis" OR "meta analysis" OR "meta-regression" OR "meta-regression" OR "synthesis" OR "meta-synthesis" OR "meta synthesis"))

ProQuest Social Science Premium Collection Search Strategy

((su(Children OR babies OR boys OR girls OR preschool children OR teenagers OR adolescents OR pediatrics)) **OR** (ab(boy* OR child* OR girl* OR kindergarten OR paediatric OR pediatric OR infan* OR baby OR babies OR toddler* OR young child* OR early childhood OR early years OR pre-school* OR preschool* OR school age* OR school-age* OR adolescen* OR youth* OR young pe* OR teen* OR pre-adolescen*)) **OR** (ti(boy* OR child* OR girl* OR kindergarten OR paediatric OR pediatric OR infan* OR baby OR babies OR toddler* OR young child* OR early childhood OR early years OR pre-school* OR preschool* OR school age* OR school-age* OR adolescen* OR youth* OR young pe* OR teen* OR pre-adolescen*))) **AND** ((SU(television OR computers OR video games OR mobile phone)) **OR** (ab(Television OR TV OR Screen viewing OR Screen time OR Screen exposure OR Computer* OR Video gam* OR Sedentary OR Inactivity OR E gam* OR e-gam* OR Tablet* OR Cell phone* OR Mobile Phone* OR Mobile us* OR Media time OR Media us* OR handheld device* OR game device* OR gaming device* OR game console* OR gaming console* OR electronic media OR smartphone* OR smart phone*)) **OR** (ti(Television OR TV OR Screen viewing OR Screen time OR Screen exposure OR Computer* OR Video gam* OR Sedentary OR Inactivity OR E gam* OR e-gam* OR Tablet* OR Cell phone* OR Mobile Phone* OR Mobile us* OR Media time OR Media us* OR handheld device* OR game device* OR gaming device* OR game console* OR gaming console* OR electronic media OR smartphone* OR smart phone*))) **AND** (TI(review OR meta-analysis OR meta-regression OR synthesis OR meta-synthesis OR meta analysis OR meta regression OR meta synthesis))

ERIC Search Strategy

((SU(child) OR SU(youth) OR SU(minor) OR SU(adolescent) OR SU(school) OR SU(pediatrics)) **OR** (AB, TI(minor*) OR AB, TI("school age population") OR AB, TI(boy*) OR AB, TI(child*) OR AB, TI(girl*) OR AB, TI(kindergarten) OR AB, TI(paediatric) OR AB, TI(pediatric) OR AB, TI(infan*) OR AB, TI(baby) OR AB, TI(babies) OR AB, TI(toddler*) OR AB, TI("young child*") OR AB, TI("early childhood") OR AB, TI("early years") OR AB, TI(pre-school*) OR AB, TI(preschool*) OR AB, TI("pre school*") OR AB, TI("school age*") OR AB, TI(school-age*) OR AB, TI(adolescen*) OR AB, TI(youth*) OR AB, TI("young pe*") OR AB, TI(teen*) OR AB, TI(preadolescen*))) **AND** ((SU(television) OR SU(computers) OR SU(video games) OR SU(sedentary lifestyle) OR SU(cell phone) OR SU(mobile phone)) **OR** (AB, TI(television) OR AB, TI(computers) OR AB, TI("video games") OR AB, TI("sedentary lifestyle") OR AB, TI(smartphone) OR AB, TI("cell phones") OR AB, TI(TV) OR AB, TI("Screen viewing") OR AB, TI("Screen time") OR AB, TI("Screen exposure") OR AB, TI(Computer*) OR AB, TI("Video gam*") OR AB, TI("Sedentary") OR AB, TI(Inactivity) OR AB, TI("E gam*") OR AB, TI(e-gam*) OR AB, TI(Tablet*) OR AB, TI("Cell phone*") OR AB, TI("Mobile Phone*") OR AB, TI("Mobile us*") OR AB, TI("Media time") OR AB, TI("Media us*") OR AB, TI("handheld device*") OR AB, TI("game device*") OR AB, TI("gaming device*") OR AB, TI("game console*") OR AB, TI("gaming console*") OR AB, TI("electronic media") OR AB, TI(smartphone*) OR AB, TI("smart phone*"))) **AND**

(TI(Review) OR TI("meta analysis") OR TI("meta regression") OR TI(synthesis) OR TI("meta synthesis") OR
TI("meta-analysis") OR TI("meta-regression") OR TI("meta-synthesis"))

Codebook for the Complete Effects Data

Autogenerated data summary from dataReporter

2023-03-12 15:46:47

Data report overview

The dataset examined has the following dimensions:

Feature	Result
Number of observations	452
Number of variables	32

Variable list

author_year

First author and publication year of meta-analysis.

Feature	Result
Variable type	character
Number of missing obs.	0 (0 %)
Number of unique values	134
Mode	"Oh, 2022"

outcome_category

Category the outcome belongs to.

Feature	Result
Variable type	character
Number of missing obs.	1 (0.22 %)
Number of unique values	4
Mode	"education"

plain_language_outcome

Specific outcome for the effect.

Feature	Result
Variable type	character
Number of missing obs.	0 (0 %)
Number of unique values	140
Mode	"Learning: General"

plain_language_exposure

Specific exposure for the effect.

Feature	Result
Variable type	character
Number of missing obs.	0 (0 %)
Number of unique values	93
Mode	"Screen use: General"

age_group

Broad age group of the participants, if specified.

Feature	Result
Variable type	character
Number of missing obs.	0 (0 %)
Number of unique values	4
Mode	"Mixed"

original_effect_size_metric

Type of effect size original_effect_size refers to.

Feature	Result
Variable type	character
Number of missing obs.	6 (1.33 %)
Number of unique values	7
Mode	"d"

original_effect_size

Effect size reported in the original meta-analysis.

Feature	Result
Variable type	numeric
Number of missing obs.	0 (0 %)
Number of unique values	286
Median	0.22
1st and 3rd quartiles	0.01; 0.68
Min. and max.	-788.59; 1185

original_cilb

Lower bound for the 95% confidence interval of the reported effect size.

Feature	Result
Variable type	numeric
Number of missing obs.	19 (4.2 %)
Number of unique values	265
Median	0.06
1st and 3rd quartiles	-0.15; 0.35
Min. and max.	-2146.87; 303

original_ciub

Upper bound for the 95% confidence interval of the reported effect size.

Feature	Result
Variable type	numeric
Number of missing obs.	19 (4.2 %)
Number of unique values	290
Median	0.44
1st and 3rd quartiles	0.12; 1.2
Min. and max.	-5.68; 2068

original_k

Number of studies reported as contributing to the reported effect size.

Feature	Result
Variable type	numeric

Feature	Result
Number of missing obs.	14 (3.1 %)
Number of unique values	52
Median	7
1st and 3rd quartiles	4; 12.75
Min. and max.	1; 274

original_n

Number of participants reported as contributing to the reported effect size.

Feature	Result
Variable type	numeric
Number of missing obs.	0 (0 %)
Number of unique values	422
Median	1857.5
1st and 3rd quartiles	643.75; 7388.5
Min. and max.	3; 527696

original_i2

Reported heterogeneity (as I-Squared) for the reported effect size.

Feature	Result
Variable type	numeric
Number of missing obs.	157 (34.73 %)
Number of unique values	198
Median	67.75
1st and 3rd quartiles	24.7; 82.9
Min. and max.	0; 99.8

converted_r

Effect size as converted to Pearson's r (where possible).

Feature	Result
Variable type	numeric
Number of missing obs.	197 (43.58 %)
Number of unique values	179
Median	0.1
1st and 3rd quartiles	-0.02; 0.2
Min. and max.	-0.26; 0.82

converted_cilb

Lower bound for the 95% confidence interval of the converted effect size.

Feature	Result
Variable type	numeric
Number of missing obs.	206 (45.58 %)
Number of unique values	181
Median	0.02
1st and 3rd quartiles	-0.11; 0.09
Min. and max.	-0.54; 0.76

converted_ciub

Upper bound for the 95% confidence interval of the converted effect size.

Feature	Result
Variable type	numeric
Number of missing obs.	206 (45.58 %)
Number of unique values	196
Median	0.19
1st and 3rd quartiles	0.06; 0.3
Min. and max.	-0.2; 0.87

reanalysis_estimate

Effect size from the reanalysis of the study-level data (where possible).

Feature	Result
Variable type	numeric
Number of missing obs.	204 (45.13 %)
Number of unique values	244
Median	0.08
1st and 3rd quartiles	-0.04; 0.18
Min. and max.	-0.47; 0.61

reanalysis_cilb

Lower bound for the 95% confidence interval of the reanalysed effect size.

Feature	Result
Variable type	numeric

Feature	Result
Number of missing obs.	204 (45.13 %)
Number of unique values	244
Median	-0.01
1st and 3rd quartiles	-0.16; 0.07
Min. and max.	-0.67; 0.45

reanalysis_ciub

Upper bound for the 95% confidence interval of the reanalysed effect size.

Feature	Result
Variable type	numeric
Number of missing obs.	204 (45.13 %)
Number of unique values	244
Median	0.16
1st and 3rd quartiles	0.05; 0.29
Min. and max.	-0.35; 0.79

reanalysis_cilb999

Lower bound for the 99.9% confidence interval of the reanalysed effect size.

Feature	Result
Variable type	numeric
Number of missing obs.	204 (45.13 %)
Number of unique values	244
Median	-0.1
1st and 3rd quartiles	-0.22; 0.02
Min. and max.	-1; 0.35

reanalysis_ciub999

Upper bound for the 99.9% confidence interval of the reanalysed effect size.

Feature	Result
Variable type	numeric
Number of missing obs.	204 (45.13 %)
Number of unique values	244
Median	0.22
1st and 3rd quartiles	0.1; 0.39
Min. and max.	-0.27; 1

reanalysis_k

Number of studies contributing to the reanalysed effect size.

Feature	Result
Variable type	integer
Number of missing obs.	204 (45.13 %)
Number of unique values	48
Median	7
1st and 3rd quartiles	4; 13
Min. and max.	1; 122

reanalysis_n

Number of participants contributing to the reanalysed effect size.

Feature	Result
Variable type	numeric
Number of missing obs.	204 (45.13 %)
Number of unique values	234
Median	1842
1st and 3rd quartiles	690.25; 5658.75
Min. and max.	26; 527696

reanalysis_i2

Heterogeneity (as I-Squared) for the reanalysed effect size.

Feature	Result
Variable type	numeric
Number of missing obs.	204 (45.13 %)
Number of unique values	199
Median	74.4
1st and 3rd quartiles	27.49; 88.44
Min. and max.	0; 99.51

reanalysis_eggers_p

P-value for the Egger's test for publication bias.

Feature	Result
Variable type	numeric

Feature	Result
Number of missing obs.	365 (80.75 %)
Number of unique values	86
Median	0.23
1st and 3rd quartiles	0.03; 0.5
Min. and max.	0; 0.98

reanalysis_eggers_cilb

Lower bound for the 95% confidence interval for the Egger's test for publication bias.

Feature	Result
Variable type	numeric
Number of missing obs.	365 (80.75 %)
Number of unique values	86
Median	-0.04
1st and 3rd quartiles	-0.19; 0.11
Min. and max.	-2.05; 0.65

reanalysis_eggers_ciub

Upper bound for the 95% confidence interval for the Egger's test for publication bias.

Feature	Result
Variable type	numeric
Number of missing obs.	365 (80.75 %)
Number of unique values	86
Median	0.29
1st and 3rd quartiles	0.11; 0.64
Min. and max.	-0.96; 1.56

reanalysis_tes_obsr

Number of observed significant tests (from Test of Excess Significance).

Feature	Result
Variable type	integer
Number of missing obs.	204 (45.13 %)
Number of unique values	32
Median	3
1st and 3rd quartiles	1; 6
Min. and max.	0; 110

reanalysis_tes_expect

Number of expected significant tests (from Test of Excess Significance).

Feature	Result
Variable type	numeric
Number of missing obs.	204 (45.13 %)
Number of unique values	244
Median	3.21
1st and 3rd quartiles	1.63; 6.78
Min. and max.	0.05; 108.26

reanalysis_tes_ratio

Ratio of observed to expected significant tests (from Test of Excess Significance).

Feature	Result
Variable type	numeric
Number of missing obs.	204 (45.13 %)
Number of unique values	219
Median	0.91
1st and 3rd quartiles	0.57; 1.09
Min. and max.	0; 2.9

reanalysis_tes_p

P-value for the Test of Excess Significance.

Feature	Result
Variable type	numeric
Number of missing obs.	204 (45.13 %)
Number of unique values	222
Median	0.8
1st and 3rd quartiles	0.58; 0.95
Min. and max.	0.01; 1

reanalysis_tes_power

Power for each of the tests (from the Test of Excess Significance).

Feature	Result
Variable type	character

Feature	Result
Number of missing obs.	204 (45.13 %)
Number of unique values	244
Mode	"0.793; 0.52; 0.463"

reanalysis_tes_theta

Value of theta used to compute the tests (from the Test of Excess Significance).

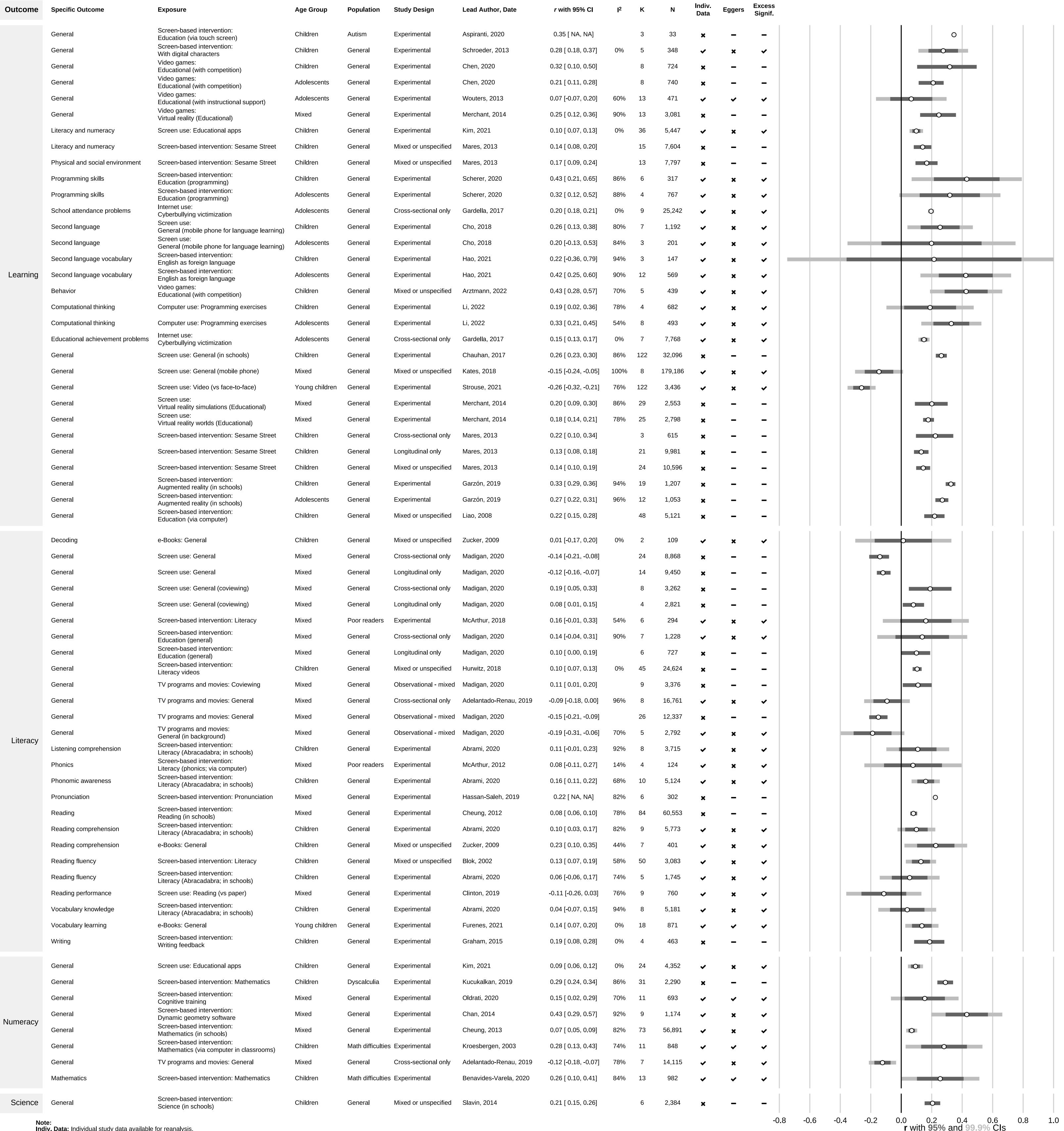
Feature	Result
Variable type	numeric
Number of missing obs.	204 (45.13 %)
Number of unique values	244
Median	0.08
1st and 3rd quartiles	-0.04; 0.18
Min. and max.	-0.47; 0.61

Report generation information:

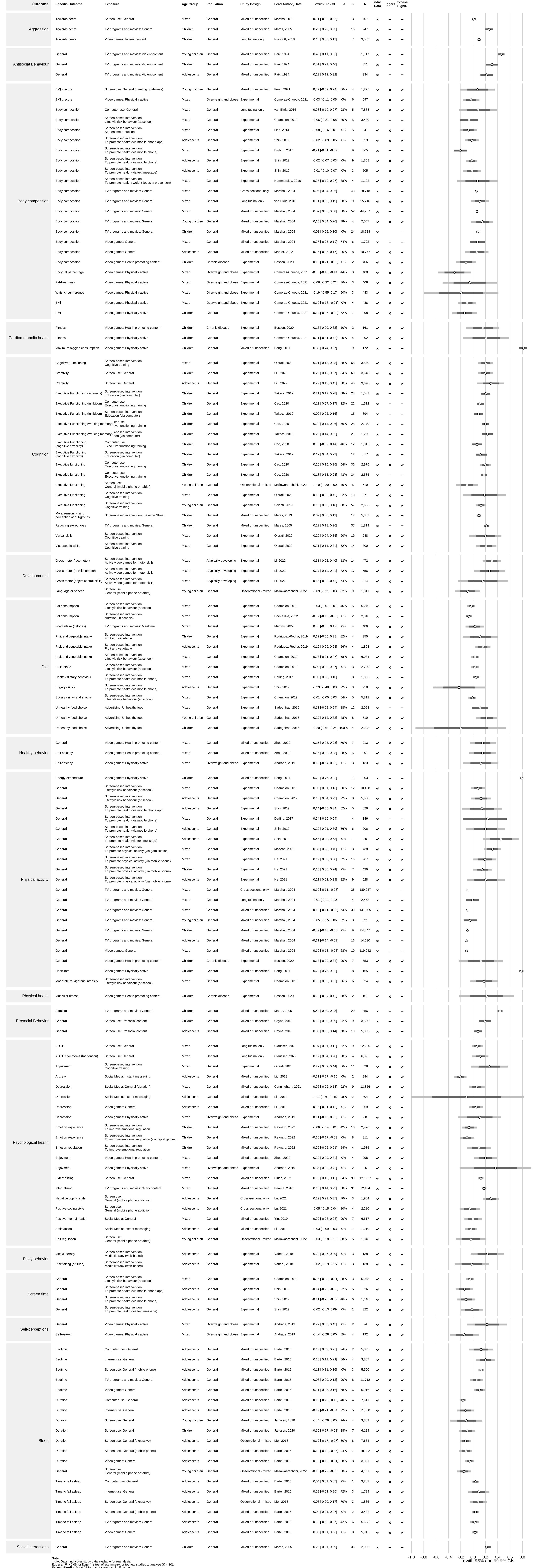
- Created by: Taren Sanders (username: taren).
- Report creation time: Sun Mar 12 2023 15:46:47
- Report was run from directory: /home/taren/Github/screen_umbrella
- dataReporter v1.0.2 [Pkg: 2021-11-11 from CRAN (R 4.2.2)]
- R version 4.2.2 Patched (2022-11-10 r83330).
- Platform: x86_64-pc-linux-gnu (64-bit)(Ubuntu 22.04.1 LTS).
- Function call:

```
dataReporter::makeDataReport(data = out_effects, output = "pdf", mode = "summarize", smartNum = FALSE, file = "supplementary_files/codebook.Rmd", replace = TRUE, openResult = FALSE, checks = list(character = "showAllFactorLevels", factor = "showAllFactorLevels", labelled = "showAllFactorLevels", haven_labelled = "showAllFactorLevels", numeric = NULL, integer = NULL, logical = NULL, Date = NULL), listChecks = FALSE, maxProbVals = Inf, addSummaryTable = FALSE, codebook = TRUE, reportTitle = "Codebook for the Complete Effects Data")
```

Associations Between Exposures and Education Outcomes



Associations Between Exposures and Health-related Outcomes



Included Studies

1. Abrami, P., Borohkovski, E. & Lysenko, L. The effects of ABRACADABRA on reading outcomes: A meta-analysis of applied field research. *Journal of Interactive Learning Research* **26**, 337–367 (2015).
2. Adelantado-Renau, M. *et al.* Association Between Screen Media Use and Academic Performance Among Children and Adolescents: A Systematic Review and Meta-analysis. *JAMA Pediatrics* **173**, 1058 (2019).
3. Aghasi, M., Matinfar, A., Golzarand, M., Salari-Moghaddam, A. & Ebrahimpour-Koujan, S. Internet Use in Relation to Overweight and Obesity: A Systematic Review and Meta-Analysis of Cross-Sectional Studies. *Advances in Nutrition* **11**, 349–356 (2019).
4. Ameryoun, A., Sanaeinab, H., Saffari, M. & Koenig, H. G. Impact of Game-Based Health Promotion Programs on Body Mass Index in Overweight/Obese Children and Adolescents: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. *Childhood Obesity* **14**, 67–80 (2018).
5. Anderson, C. A. *et al.* Violent video game effects on aggression, empathy, and prosocial behavior in Eastern and Western countries: A meta-analytic review. *Psychological Bulletin* **136**, 151–173 (2010).
6. Andrade, A., Correia, C. K. & Coimbra, D. R. The Psychological Effects of Exergames for Children and Adolescents with Obesity: A Systematic Review and Meta-Analysis. *Cyberpsychology, Behavior, and Social Networking* **22**, 724–735 (2019).
7. Aspiranti, K. B., Larwin, K. H. & Schade, B. P. iPads/tablets and students with autism: A meta-analysis of academic effects. *Assistive Technology* **32**, 23–30 (2020).
8. Barnett, A., Cerin, E. & Baranowski, T. Active Video Games for Youth: A Systematic Review. *Journal of Physical Activity and Health* **8**, 724–737 (2011).
9. Bartel, K. A., Gradisar, M. & Williamson, P. Protective and risk factors for adolescent sleep: A meta-analytic review. *Sleep Medicine Reviews* **21**, 72–85 (2015).
10. Blok, H., Oostdam, R., Otter, M. E. & Overmaat, M. Computer-assisted instruction in support of beginning reading instruction: A review. *Review of educational research* **72**, 101–130 (2002).
11. Bochner, R. E., Sorensen, K. M. & Belamarich, P. F. The Impact of Active Video Gaming on Weight in Youth: A Meta-Analysis. *Clinical Pediatrics* **54**, 620–628 (2015).
12. Bossen, D. *et al.* Effectiveness of Serious Games to Increase Physical Activity in Children With a Chronic Disease: Systematic Review With Meta-Analysis. *Journal of Medical Internet Research* **22**, e14549 (2020).
13. Boyland, E. J. *et al.* Advertising as a cue to consume: A systematic review and meta-analysis of the effects of acute exposure to unhealthy food and nonalcoholic beverage advertising on intake in children and adults. *American Journal of Clinical Nutrition* **103**, 519–533 (2016).
14. Byun, J. & Joung, E. Digital game-based learning for K-12 mathematics education: A meta-analysis. *School Science and Mathematics* **118**, 113–126 (2018).
15. Champion, K. E. *et al.* Effectiveness of school-based eHealth interventions to prevent multiple lifestyle risk behaviours among adolescents: A systematic review and meta-analysis. *The Lancet Digital Health* **1**, e206–e221 (2019).
16. Chan, K. K. & Leung, S. W. Dynamic Geometry Software Improves Mathematical Achievement: Systematic Review and Meta-Analysis. *Journal of Educational Computing Research* **51**, 311–325 (2014).
17. Chen, L., Ho, S. S. & Lwin, M. O. A meta-analysis of factors predicting cyberbullying perpetration and victimization: From the social cognitive and media effects approach. *New Media & Society* **19**, 1194–1213 (2017).
18. Cheung, A. C. K. & Slavin, R. E. The effectiveness of educational technology applications for enhancing mathematics achievement in K-12 classrooms: A meta-analysis. *Educational Research Review* **9**, 88–113 (2013).

19. Cheung, A. C. K. & Slavin, R. E. Effects of Educational Technology Applications on Reading Outcomes for Struggling Readers: A Best-Evidence Synthesis. *Reading Research Quarterly* **48**, 277–299 (2013).
20. Cheung, A. C. K. & Slavin, R. E. How features of educational technology applications affect student reading outcomes: A meta-analysis. *Educational Research Review* **7**, 198–215 (2012).
21. Chodura, S., Kuhn, J.-T. & Holling, H. Interventions for Children With Mathematical Difficulties: A Meta-Analysis. *Zeitschrift für Psychologie* **223**, 129–144 (2015).
22. Cox, R., Skouteris, H., Rutherford, L. & Fuller-Tyszkiewicz, M. The Association between Television Viewing and Preschool Child Body Mass Index: A systematic review of English papers published from 1995 to 2010. *Journal of Children and Media* **6**, 198–220 (2012).
23. Coyne, S. M. *et al.* A meta-analysis of prosocial media on prosocial behavior, aggression, and empathic concern: A multidimensional approach. *Developmental Psychology* **54**, 331–347 (2018).
24. Cushing, C. C. & Steele, R. G. A Meta-Analytic Review of eHealth Interventions for Pediatric Health Promoting and Maintaining Behaviors. *Journal of Pediatric Psychology* **35**, 937–949 (2010).
25. Darling, K. E. & Sato, A. F. Systematic Review and Meta-Analysis Examining the Effectiveness of Mobile Health Technologies in Using Self-Monitoring for Pediatric Weight Management. *Childhood Obesity* **13**, 347–355 (2017).
26. Davey, S. & Davey, A. Assessment of Smartphone Addiction in Indian Adolescents: A Mixed Method Study by Systematic-review and Meta-analysis Approach. *International Journal of Preventive Medicine* **5**, 1500–1511 (2014).
27. Oliveira, R. G. de & Guedes, D. P. Physical Activity, Sedentary Behavior, Cardiorespiratory Fitness and Metabolic Syndrome in Adolescents: Systematic Review and Meta-Analysis of Observational Evidence. *PLOS ONE* **11**, e0168503 (2016).
28. de Ribera, O. S., Trajtenberg, N., Shenderovich, Y. & Murray, J. Correlates of youth violence in low- and middle-income countries: A meta-analysis. *Aggression and Violent Behavior* **49**, 101306 (2019).
29. Fang, K., Mu, M., Liu, K. & He, Y. Screen time and childhood overweight/obesity: A systematic review and meta-analysis. *Child: Care, Health and Development* **45**, 744–753 (2019).
30. Fedele, D. A., Cushing, C. C., Fritz, A., Amaro, C. M. & Ortega, A. Mobile Health Interventions for Improving Health Outcomes in Youth: A Meta-analysis. *JAMA Pediatrics* **171**, 461 (2017).
31. Ferguson, C. J., Nielsen, R. K. L. & Markey, P. M. Does Sexy Media Promote Teen Sex? A Meta-Analytic and Methodological Review. *Psychiatric Quarterly* **88**, 349–358 (2017).
32. Ferguson, C. J. Do Angry Birds Make for Angry Children? A Meta-Analysis of Video Game Influences on Children's and Adolescents' Aggression, Mental Health, Prosocial Behavior, and Academic Performance. *Perspectives on Psychological Science* **10**, 646–666 (2015).
33. Ferguson, C. J. 13 Reasons Why Not: A Methodological and Meta-Analytic Review of Evidence Regarding Suicide Contagion by Fictional Media. *Suicide and Life-Threatening Behavior* **49**, 1178–1186 (2019).
34. Fischer, P., Greitemeyer, T., Kastenmüller, A., Vogrincic, C. & Sauer, A. The effects of risk-glorifying media exposure on risk-positive cognitions, emotions, and behaviors: A meta-analytic review. *Psychological Bulletin* **137**, 367–390 (2011).
35. Folkvord, F. & van 't Riet, J. The persuasive effect of advergames promoting unhealthy foods among children: A meta-analysis. *Appetite* **129**, 245–251 (2018).
36. Gao, Z., Chen, S., Pasco, D. & Pope, Z. A meta-analysis of active video games on health outcomes among children and adolescents: A meta-analysis of active video games. *Obesity Reviews* **16**, 783–794 (2015).
37. Gardella, J. H., Fisher, B. W. & Teurbe-Tolon, A. R. A Systematic Review and Meta-Analysis of Cyber-Victimization and Educational Outcomes for Adolescents. *Review of Educational Research* **87**, 283–308 (2017).

38. Ghobadi, S. *et al.* Association of eating while television viewing and overweight/obesity among children and adolescents: A systematic review and meta-analysis of observational studies: Television viewing, overweight, obesity, children. *Obesity Reviews* **19**, 313–320 (2018).
39. Grabe, S., Ward, L. M. & Hyde, J. S. The role of the media in body image concerns among women: A meta-analysis of experimental and correlational studies. *Psychological Bulletin* **134**, 460–476 (2008).
40. Graham, S., Hebert, M. & Harris, K. R. Formative Assessment and Writing: A Meta-Analysis. *The Elementary School Journal* **115**, 523–547 (2015).
41. Mahdi, H. S. & Al Khateeb, A. A. The effectiveness of computer-assisted pronunciation training: A meta-analysis. *Review of Education* **7**, 733–753 (2019).
42. Hernández-Jiménez, C. *et al.* Impact of Active Video Games on Body Mass Index in Children and Adolescents: Systematic Review and Meta-Analysis Evaluating the Quality of Primary Studies. *International Journal of Environmental Research and Public Health* **16**, 2424 (2019).
43. Huang, Q., Peng, W. & Ahn, S. When media become the mirror: A meta-analysis on media and body image. *Media Psychology* **24**, 437–489 (2021).
44. Hurwitz, L. B. Getting a Read on Ready To Learn Media: A Meta-analytic Review of Effects on Literacy. *Child Development* **90**, 1754–1771 (2019).
45. Janssen, X. *et al.* Associations of screen time, sedentary time and physical activity with sleep in under 5s: A systematic review and meta-analysis. *Sleep Medicine Reviews* **49**, 101226 (2020).
46. Kates, A. W., Wu, H. & Coryn, C. L. S. The effects of mobile phone use on academic performance: A meta-analysis. *Computers & Education* **127**, 107–112 (2018).
47. Kroesbergen, E. H. & Van Luit, J. E. H. Mathematics Interventions for Children with Special Educational Needs: A Meta-Analysis. *Remedial and Special Education* **24**, 97–114 (2003).
48. Küçükalkan, K., Beyazsağlı, M. & Öz, A. S. Examination of the effects of computer-based mathematics instruction methods in children with mathematical learning difficulties: A meta-analysis. *Behaviour & Information Technology* **38**, 913–923 (2019).
49. Lanca, C. & Saw, S.-M. The association between digital screen time and myopia: A systematic review. *Ophthalmic and Physiological Optics* **40**, 216–229 (2020).
50. Larwin, K. H. & Aspiranti, K. B. Measuring the Academic Outcomes of iPads for Students with Autism: A Meta-Analysis. *Review Journal of Autism and Developmental Disorders* **6**, 233–241 (2019).
51. Lee, J., Piao, M., Byun, A. & Kim, J. A systematic review and meta-analysis of intervention for pediatric obesity using mobile technology. *Nursing Informatics 2016* **225**, 491–494 (2016).
52. Li, Q. & Ma, X. A Meta-analysis of the Effects of Computer Technology on School Students' Mathematics Learning. *Educational Psychology Review* **22**, 215–243 (2010).
53. Liao, Y., Liao, J., Durand, C. P. & Dunton, G. F. Which type of sedentary behaviour intervention is more effective at reducing body mass index in children? A meta-analytic review: Sedentary behaviour intervention effects. *Obesity Reviews* **15**, 159–168 (2014).
54. Liao, Y.-k. C., Chang, H.-w. & Chen, Y.-w. Effects of Computer Application on Elementary School Student's Achievement: A Meta-Analysis of Students in Taiwan. *Computers in the Schools* **24**, 43–64 (2007).
55. Liao, Y.-K. Effects of Computer-Assisted Instruction on Cognitive Outcomes: A Meta-Analysis. *Journal of Research on Computing in Education* **24**, 367–80 (1992).
56. Liu, M., Wu, L. & Yao, S. DoseResponse association of screen time-based sedentary behaviour in children and adolescents and depression: A meta-analysis of observational studies. *British Journal of Sports Medicine* **50**, 1252–1258 (2016).
57. Liu, D., Baumeister, R. F., Yang, C.-c. & Hu, B. Digital Communication Media Use and Psychological Well-Being: A Meta-Analysis. *Journal of Computer-Mediated Communication* **24**, 259–273 (2019).

58. Luckner, H., Moss, J. R. & Gericke, C. A. Effectiveness of interventions to promote healthy weight in general populations of children and adults: A meta-analysis. *European Journal of Public Health* **22**, 491–497 (2012).
59. Madigan, S., McArthur, B. A., Anhorn, C., Eirich, R. & Christakis, D. A. Associations Between Screen Use and Child Language Skills: A Systematic Review and Meta-analysis. *JAMA Pediatrics* **174**, 665 (2020).
60. Mares, M.-L. & Pan, Z. Effects of Sesame Street: A meta-analysis of children's learning in 15 countries. *Journal of Applied Developmental Psychology* **34**, 140–151 (2013).
61. Mares, M.-L. & Woodard, E. Positive Effects of Television on Children's Social Interactions: A Meta-Analysis. *Media Psychology* **7**, 301–322 (2005).
62. Marshall, S. J., Biddle, S. J. H., Gorely, T., Cameron, N. & Murdey, I. Relationships between media use, body fatness and physical activity in children and youth: A meta-analysis. *International Journal of Obesity* **28**, 1238–1246 (2004).
63. Martins, N. & Weaver, A. The role of media exposure on relational aggression: A meta-analysis. *Aggression and Violent Behavior* **47**, 90–99 (2019).
64. McArthur, G. *et al.* Phonics training for English-speaking poor readers. *Cochrane Database of Systematic Reviews* (2012) doi:10.1002/14651858.CD009115.pub2.
65. McArthur, G. *et al.* Phonics training for English-speaking poor readers. *Cochrane Database of Systematic Reviews* **2018**, (2018).
66. Moran, J., Ferdig, R. E., Pearson, P. D., Wardrop, J. & Blomeyer, R. L. Technology and Reading Performance in the Middle-School Grades: A Meta-Analysis with Recommendations for Policy and Practice. *Journal of Literacy Research* **40**, 6–58 (2008).
67. Nikkelen, S. W. C., Valkenburg, P. M., Huizinga, M. & Bushman, B. J. Media use and ADHD-related behaviors in children and adolescents: A meta-analysis. *Developmental Psychology* **50**, 2228–2241 (2014).
68. Oldrati, V. *et al.* Effectiveness of Computerized Cognitive Training Programs (CCTP) with Game-like Features in Children with or without Neuropsychological Disorders: A Meta-Analytic Investigation. *Neuropsychology Review* **30**, 126–141 (2020).
69. Oliveira, C. B. *et al.* Effects of active video games on children and adolescents: A systematic review with meta-analysis. *Scandinavian Journal of Medicine & Science in Sports* **30**, 4–12 (2020).
70. Ozdemir, M., Sahin, C., Arcagok, S. & Demir, M. K. The Effect of Augmented Reality Applications in the Learning Process: A MetaAnalysis Study. *Eurasian Journal of Educational Research* **18**, 1–22 (2018).
71. Paik, H. & Comstock, G. The Effects of Television Violence on Antisocial Behavior: A Meta-Analysis. *Communication Research* **21**, 516–546 (1994).
72. Pearce, L. J. & Field, A. P. The Impact of 'Scary' TV and Film on Children's Internalizing Emotions: A Meta-Analysis. *Human Communication Research* **42**, 98–121 (2016).
73. Peng, W., Lin, J.-H. & Crouse, J. Is Playing Exergames Really Exercising? A Meta-Analysis of Energy Expenditure in Active Video Games. *Cyberpsychology, Behavior, and Social Networking* **14**, 681–688 (2011).
74. Poorolajal, J., Sahraei, F., Mohammadi, Y., Doosti-Irani, A. & Moradi, L. Behavioral factors influencing childhood obesity: A systematic review and meta-analysis. *Obesity Research & Clinical Practice* **14**, 109–118 (2020).
75. Prescott, A. T., Sargent, J. D. & Hull, J. G. Metaanalysis of the relationship between violent video game play and physical aggression over time. *Proceedings of the National Academy of Sciences* **115**, 9882–9888 (2018).
76. Prizant-Passal, S., Shechner, T. & Aderka, I. M. Social anxiety and internet use A meta-analysis: What do we know? What are we missing? *Computers in Human Behavior* **62**, 221–229 (2016).

77. Rodriguez Rocha, N. P. & Kim, H. eHealth Interventions for Fruit and Vegetable Intake: A Meta-Analysis of Effectiveness. *Health Education & Behavior* **46**, 947–959 (2019).
78. Russell, S. J., Croker, H. & Viner, R. M. The effect of screen advertising on children's dietary intake: A systematic review and meta-analysis. *Obesity Reviews* **20**, 554–568 (2019).
79. Ryan, A. W. Meta-Analysis of Achievement Effects of Microcomputer Applications in Elementary Schools. *Educational Administration Quarterly* **27**, 161–184 (1991).
80. Sadeghirad, B., Duhaney, T., Motaghipisheh, S., Campbell, N. R. C. & Johnston, B. C. Influence of unhealthy food and beverage marketing on children's dietary intake and preference: A systematic review and meta-analysis of randomized trials. *Obesity Reviews* **17**, 945–959 (2016).
81. Scherer, R., Siddiq, F. & Sánchez Viveros, B. The cognitive benefits of learning computer programming: A meta-analysis of transfer effects. *Journal of Educational Psychology* **111**, 764–792 (2019).
82. Schroeder, N. L., Adesope, O. O. & Gilbert, R. B. How Effective are Pedagogical Agents for Learning? A Meta-Analytic Review. *Journal of Educational Computing Research* **49**, 1–39 (2013).
83. Scionti, N., Cavallero, M., Zogmaister, C. & Marzocchi, G. M. Is Cognitive Training Effective for Improving Executive Functions in Preschoolers? A Systematic Review and Meta-Analysis. *Frontiers in Psychology* **10**, 2812 (2020).
84. Shahab, L. & McEwen, A. Online support for smoking cessation: A systematic review of the literature. *Addiction* **104**, 1792–1804 (2009).
85. Shin, Y., Kim, S. K. & Lee, M. Mobile phone interventions to improve adolescents' physical health: A systematic review and meta-analysis. *Public Health Nursing* **36**, 787–799 (2019).
86. Slavin, R. E. Reading Effects of IBM's "Writing to Read" Program: A Review of Evaluations. *Educational Evaluation and Policy Analysis* **13**, 1 (1991).
87. Slavin, R. E., Lake, C. & Groff, C. Effective Programs in Middle and High School Mathematics: A Best-Evidence Synthesis. *Review of Educational Research* **79**, 839–911 (2009).
88. Slavin, R. E. & Lake, C. Effective Programs in Elementary Mathematics: A Best-Evidence Synthesis. *Review of Educational Research* **78**, 427–515 (2008).
89. Slavin, R. E., Lake, C., Hanley, P. & Thurston, A. Experimental evaluations of elementary science programs: A best-evidence synthesis. *Journal of Research in Science Teaching* **51**, 870–901 (2014).
90. Stavrinos, D., Pope, C. N., Shen, J. & Schwebel, D. C. Distracted Walking, Bicycling, and Driving: Systematic Review and Meta-Analysis of Mobile Technology and Youth Crash Risk. *Child Development* **89**, 118–128 (2018).
91. Steele, J. L., Bozick, R. & Davis, L. M. Education for Incarcerated Juveniles: A Meta-Analysis. *Journal of Education for Students Placed at Risk (JESPAR)* **21**, 65–89 (2016).
92. Strong, G. K., Torgerson, C. J., Torgerson, D. & Hulme, C. A systematic meta-analytic review of evidence for the effectiveness of the 'Fast ForWord' language intervention program. *Journal of Child Psychology and Psychiatry* **52**, 224–235 (2011).
93. Takacs, Z. K., Swart, E. K. & Bus, A. G. Can the computer replace the adult for storybook reading? A meta-analysis on the effects of multimedia stories as compared to sharing print stories with an adult. *Frontiers in Psychology* **5**, (2014).
94. Takacs, Z. K., Swart, E. K. & Bus, A. G. Benefits and Pitfalls of Multimedia and Interactive Features in Technology-Enhanced Storybooks: A Meta-Analysis. *Review of Educational Research* **85**, 698–739 (2015).
95. Takacs, Z. K. & Kassai, R. The efficacy of different interventions to foster children's executive function skills: A series of meta-analyses. *Psychological Bulletin* **145**, 653–697 (2019).
96. Tamim, R. M., Bernard, R. M., Borokhovski, E., Abrami, P. C. & Schmid, R. F. What Forty Years of Research Says About the Impact of Technology on Learning: A Second-Order Meta-Analysis and Validation Study. *Review of Educational Research* **81**, 4–28 (2011).

97. Tekedere, H. & Göke, H. Examining the Effectiveness of Augmented Reality Applications in Education: A Meta-Analysis. *International Journal of Environmental and Science Education* **11**, 9469–9481 (2016).
98. Tingir, S., Cavlazoglu, B., Caliskan, O., Koklu, O. & Intepe-Tingir, S. Effects of mobile devices on K-12 students' achievement: A meta-analysis: Effects of mobile devices. *Journal of Computer Assisted Learning* **33**, 355–369 (2017).
99. Tremblay, M. S. *et al.* Systematic review of sedentary behaviour and health indicators in school-aged children and youth. *International Journal of Behavioral Nutrition and Physical Activity* **8**, 98 (2011).
100. Vahedi, Z., Sibalis, A. & Sutherland, J. E. Are media literacy interventions effective at changing attitudes and intentions towards risky health behaviors in adolescents? A meta-analytic review. *Journal of Adolescence* **67**, 140–152 (2018).
101. van 't Riet, J., Crutzen, R. & Lu, A. S. How Effective Are Active Videogames Among the Young and the Old? Adding Meta-analyses to Two Recent Systematic Reviews. *Games for Health Journal* **3**, 311–318 (2014).
102. van Ekris, E. *et al.* An evidence-update on the prospective relationship between childhood sedentary behaviour and biomedical health indicators: A systematic review and meta-analysis. *Obesity Reviews* **17**, 833–849 (2016).
103. van Grieken, A., Ezendam, N. P., Paulis, W. D., van der Wouden, J. C. & Raat, H. Primary prevention of overweight in children and adolescents: A meta-analysis of the effectiveness of interventions aiming to decrease sedentary behaviour. *International Journal of Behavioral Nutrition and Physical Activity* **9**, 61 (2012).
104. Vannucci, A., Simpson, E. G., Gagnon, S. & Ohannessian, C. M. Social media use and risky behaviors in adolescents: A meta-analysis. *Journal of Adolescence* **79**, 258–274 (2020).
105. Villegas-Navas, V., Montero-Simo, M.-J. & Araque-Padilla, R. A. The Effects of Foods Embedded in Entertainment Media on Children's Food Choices and Food Intake: A Systematic Review and Meta-Analyses. *Nutrients* **12**, 964 (2020).
106. Wahi, G. Effectiveness of Interventions Aimed at Reducing Screen Time in Children: A Systematic Review and Meta-analysis of Randomized Controlled Trials. *Archives of Pediatrics & Adolescent Medicine* **165**, 979 (2011).
107. Weng, P.-L., Maeda, Y. & Bouck, E. C. Effectiveness of Cognitive Skills-Based Computer-Assisted Instruction for Students With Disabilities: A Synthesis. *Remedial and Special Education* **35**, 167–180 (2014).
108. Williams, P. A., Haertel, E. H., Haertel, G. D. & Walberg, H. J. The Impact of Leisure-Time Television on School Learning: A Research Synthesis. *American Educational Research Journal* **19**, 19–50 (1982).
109. Wood, W., Wong, F. Y. & Chachere, J. G. Effects of media violence on viewers' aggression in unconstrained social interaction. *Psychological Bulletin* **109**, 371–383 (1991).
110. Xie, H. *et al.* Can Touchscreen Devices be Used to Facilitate Young Children's Learning? A Meta-Analysis of Touchscreen Learning Effect. *Frontiers in Psychology* **9**, 2580 (2018).
111. Zhang, G., Wu, L., Zhou, L., Lu, W. & Mao, C. Television watching and risk of childhood obesity: A meta-analysis. *The European Journal of Public Health* **26**, 13–18 (2016).
112. Zhou, C., Occa, A., Kim, S. & Morgan, S. A Meta-analysis of Narrative Game-based Interventions for Promoting Healthy Behaviors. *Journal of Health Communication* **25**, 54–65 (2020).
113. Zucker, T. A., Moody, A. K. & McKenna, M. C. The Effects of Electronic Books on Pre-Kindergarten-to-Grade 5 Students' Literacy and Language Outcomes: A Research Synthesis. *Journal of Educational Computing Research* **40**, 47–87 (2009).
114. Foreman, J. *et al.* Association between digital smart device use and myopia: A systematic review and meta-analysis. *The Lancet Digital Health* **3**, e806–e818 (2021).

115. Comeras-Chueca, C. *et al.* The Effects of Active Video Games on Health-Related Physical Fitness and Motor Competence in Children and Adolescents with Healthy Weight: A Systematic Review and Meta-Analysis. *International Journal of Environmental Research and Public Health* **18**, 6965 (2021).
116. Li, C., Cheng, G., Sha, T., Cheng, W. & Yan, Y. The Relationships between Screen Use and Health Indicators among Infants, Toddlers, and Preschoolers: A Meta-Analysis and Systematic Review. *International Journal of Environmental Research and Public Health* **17**, 7324 (2020).
117. Comeras-Chueca, C. *et al.* Effects of Active Video Games on Health-Related Physical Fitness and Motor Competence in Children and Adolescents With Overweight or Obesity: Systematic Review and Meta-Analysis. *JMIR Serious Games* **9**, e29981 (2021).
118. Lu, G.-L. *et al.* The correlation between mobile phone addiction and coping style among Chinese adolescents: A meta-analysis. *Child and Adolescent Psychiatry and Mental Health* **15**, 60 (2021).
119. Wang, J., Li, M., Zhu, D. & Cao, Y. Smartphone Overuse and Visual Impairment in Children and Young Adults: Systematic Review and Meta-Analysis. *Journal of Medical Internet Research* **22**, e21923 (2020).
120. Suleiman-Martos, N. *et al.* Gamification for the Improvement of Diet, Nutritional Habits, and Body Composition in Children and Adolescents: A Systematic Review and Meta-Analysis. *Nutrients* **13**, 2478 (2021).
121. Nesi, J. *et al.* Social media use and self-injurious thoughts and behaviors: A systematic review and meta-analysis. *Clinical Psychology Review* **87**, 102038 (2021).
122. He, Z. *et al.* Effects of Smartphone-Based Interventions on Physical Activity in Children and Adolescents: Systematic Review and Meta-analysis. *JMIR mHealth and uHealth* **9**, e22601 (2021).
123. Cao, Y., Huang, T., Huang, J., Xie, X. & Wang, Y. Effects and Moderators of Computer-Based Training on Children's Executive Functions: A Systematic Review and Meta-Analysis. *Frontiers in Psychology* **11**, 580329 (2020).
124. Ivie, E. J., Pettitt, A., Moses, L. J. & Allen, N. B. A meta-analysis of the association between adolescent social media use and depressive symptoms. *Journal of Affective Disorders* **275**, 165–174 (2020).
125. David, O. A., Costescu, C., Cardos, R. & Mogoaşe, C. How Effective are Serious Games for Promoting Mental Health and Health Behavioral Change in Children and Adolescents? A Systematic Review and Meta-analysis. *Child & Youth Care Forum* **49**, 817–838 (2020).
126. Ferguson, C. J. *et al.* Like this meta-analysis: Screen media and mental health. *Professional Psychology: Research and Practice* **53**, 205–214 (2022).
127. Burkhardt, J. & Lenhard, W. A Meta-Analysis on the Longitudinal, Age-Dependent Effects of Violent Video Games on Aggression. *Media Psychology* **25**, 499–512 (2022).
128. Feng, J., Zheng, C., Sit, C. H.-P., Reilly, J. J. & Huang, W. Y. Associations between meeting 24-hour movement guidelines and health in the early years: A systematic review and meta-analysis. *Journal of Sports Sciences* **39**, 2545–2557 (2021).
129. Park, J., Park, M.-J. & Seo, Y.-G. Effectiveness of Information and Communication Technology on Obesity in Childhood and Adolescence: Systematic Review and Meta-analysis. *Journal of Medical Internet Research* **23**, e29003 (2021).
130. Benavides-Varela, S. *et al.* Effectiveness of digital-based interventions for children with mathematical learning difficulties: A meta-analysis. *Computers & Education* **157**, 103953 (2020).
131. Major, L., Francis, G. A. & Tsapali, M. The effectiveness of technology-supported personalised learning in low- and middle-income countries: A meta-analysis. *British Journal of Educational Technology* **52**, 1935–1964 (2021).
132. Sun, L., Hu, L. & Zhou, D. Which way of design programming activities is more effective to promote K-12 students' computational thinking skills? A meta-analysis. *Journal of Computer Assisted Learning* **37**, 1048–1062 (2021).

133. Hao, T., Wang, Z. & Ardasheva, Y. Technology-Assisted Vocabulary Learning for EFL Learners: A Meta-Analysis. *Journal of Research on Educational Effectiveness* **14**, 645–667 (2021).
134. Abrami, P. C., Lysenko, L. & Borokhovski, E. The effects of ABRACADABRA on reading outcomes: An updated meta-analysis and landscape review of applied field research. *Journal of Computer Assisted Learning* **36**, 260–279 (2020).
135. Kristensen, J. H., Pallesen, S., King, D. L., Hysing, M. & Erevik, E. K. Problematic Gaming and Sleep: A Systematic Review and Meta-Analysis. *Frontiers in Psychiatry* **12**, 675237 (2021).
136. Fowler, L. A. *et al.* Harnessing technological solutions for childhood obesity prevention and treatment: A systematic review and meta-analysis of current applications. *International Journal of Obesity* **45**, 957–981 (2021).
137. Beneria, A. *et al.* Online interventions for cannabis use among adolescents and young adults: Systematic review and meta-analysis. *Early Intervention in Psychiatry* **16**, 821–844 (2022).
138. Chan, G. *et al.* The impact of eSports and online video gaming on lifestyle behaviours in youth: A systematic review. *Computers in Human Behavior* **126**, 106974 (2022).
139. Zhang, Y., Li, S. & Yu, G. The relationship between social media use and fear of missing out: A meta-analysis. *Acta Psychologica Sinica* **53**, 273–290 (2021).
140. Ferguson, C. J., Copenhaver, A. & Markey, P. Reexamining the Findings of the American Psychological Association's 2015 Task Force on Violent Media: A Meta-Analysis. *Perspectives on Psychological Science* **15**, 1423–1443 (2020).
141. Cunningham, S., Hudson, C. C. & Harkness, K. Social Media and Depression Symptoms: A Meta-Analysis. *Research on Child and Adolescent Psychopathology* **49**, 241–253 (2021).
142. Strouse, G. A. & Samson, J. E. Learning From Video: A Meta-Analysis of the Video Deficit in Children Ages 0 to 6 Years. *Child Development* **92**, E20–E38 (2021).
143. Chen, C.-H., Shih, C.-C. & Law, V. The Effects of Competition in Digital Game-Based Learning (DGBL): A Meta-Analysis. *Educational Technology Research and Development* **68**, 1855–1873 (2020).
144. Furenes, M. I., Kucirkova, N. & Bus, A. G. A Comparison of Children's Reading on Paper versus Screen: A Meta-Analysis. *Review of Educational Research* **91**, 483–517 (2021).
145. Öztop, F. & Nayci, Ö. Does the Digital Generation Comprehend Better from the Screen or from the Paper?: A Meta-Analysis. *International Online Journal of Education and Teaching* **8**, 1206–1224 (2021).
146. Ho, R. S.-T., Chan, E. K.-Y., Liu, K. K.-Y. & Wong, S. H.-S. Active video game on children and adolescents' physical activity and weight management: A network meta-analysis. *Scandinavian Journal of Medicine & Science in Sports* **32**, 1268–1286 (2022).
147. Claussen, A. H. *et al.* All in the Family? A Systematic Review and Meta-analysis of Parenting and Family Environment as Risk Factors for Attention-Deficit/Hyperactivity Disorder (ADHD) in Children. *Prevention Science* (2022) doi:10.1007/s11121-022-01358-4.
148. Li, S., Song, Y., Cai, Z. & Zhang, Q. Are active video games useful in the development of gross motor skills among non-typically developing children? A meta-analysis. *BMC Sports Science, Medicine and Rehabilitation* **14**, 140 (2022).
149. Baradaran Mahdavi, S., Riahi, R., Vahdatpour, B. & Kelishadi, R. Association between sedentary behavior and low back pain; A systematic review and meta-analysis. *Health Promotion Perspectives* **11**, 393–410 (2021).
150. Yang, Q., Liu, J. & Rui, J. Association between social network sites use and mental illness: A meta-analysis. *Cyberpsychology: Journal of Psychosocial Research on Cyberspace* **16**, (2022).
151. Boyland, E. *et al.* Association of Food and Nonalcoholic Beverage Marketing With Children and Adolescents' Eating Behaviors and Health: A Systematic Review and Meta-analysis. *JAMA Pediatrics* **176**, e221037 (2022).

152. Eirich, R. *et al.* Association of Screen Time With Internalizing and Externalizing Behavior Problems in Children 12 Years or Younger: A Systematic Review and Meta-analysis. *JAMA Psychiatry* **79**, 393 (2022).
153. Mallawaarachchi, S. R., Anglim, J., Hooley, M. & Horwood, S. Associations of smartphone and tablet use in early childhood with psychosocial, cognitive and sleep factors: A systematic review and meta-analysis. *Early Childhood Research Quarterly* **60**, 13–33 (33AD).
154. Cai, Y., Pan, Z. & Liu, M. Augmented reality technology in language learning: A meta-analysis. *Journal of Computer Assisted Learning* **38**, 929–945 (2022).
155. Reynard, S., Dias, J., Mitic, M., Schrank, B. & Woodcock, K. A. Digital Interventions for Emotion Regulation in Children and Early Adolescents: Systematic Review and Meta-analysis. *JMIR Serious Games* **10**, e31456 (2022).
156. Oh, C., Carducci, B., Vaivada, T. & Bhutta, Z. A. Digital Interventions for Universal Health Promotion in Children and Adolescents: A Systematic Review. *Pediatrics* **149**, e2021053852H (2022).
157. Marciano, L., Ostroumova, M., Schulz, P. J. & Camerini, A.-L. Digital Media Use and Adolescents' Mental Health During the Covid-19 Pandemic: A Systematic Review and Meta-Analysis. *Frontiers in Public Health* **9**, 793868 (2022).
158. Erçelik, Z. E. & Çağlar, S. Effectiveness of active video games in overweight and obese adolescents: A systematic review and meta-analysis of randomized controlled trials. *Annals of Pediatric Endocrinology & Metabolism* **27**, 98–104 (2022).
159. Li, F., Wang, X., He, X., Cheng, L. & Wang, Y. The effectiveness of unplugged activities and programming exercises in computational thinking education: A Meta-analysis. *Education and Information Technologies* **27**, 7993–8013 (2022).
160. Beck Silva, K. B., Miranda Pereira, E., Santana, M. L. P. de, Costa, P. R. F. & Silva, R. de C. R. Effects of computer-based interventions on food consumption and anthropometric parameters of adolescents: A systematic review and metanalysis. *Critical Reviews in Food Science and Nutrition* 1–13 (2022) doi:10.1080/10408398.2022.2118227.
161. Arztmann, M., Hornstra, L., Jeuring, J. & Kester, L. Effects of games in STEM education: A meta-analysis on the moderating role of student background characteristics. *Studies in Science Education* **59**, 109–145 (2022).
162. Mazeas, A., Duclos, M., Pereira, B. & Chalabaev, A. Evaluating the Effectiveness of Gamification on Physical Activity: Systematic Review and Meta-analysis of Randomized Controlled Trials. *Journal of Medical Internet Research* **24**, e26779 (2022).
163. Marker, C., Gnamb, T. & Appel, M. Exploring the myth of the chubby gamer: A meta-analysis on sedentary video gaming and body mass. *Social Science & Medicine* **301**, 112325 (2022).
164. Martins, N. C. *et al.* Influence of eating with distractors on caloric intake of children and adolescents: A systematic review and meta-analysis of interventional controlled studies. *Critical Reviews in Food Science and Nutrition* 1–10 (2022) doi:10.1080/10408398.2022.2055525.
165. Zhang, J., Yang, S. X., Wang, L., Han, L. H. & Wu, X. Y. The influence of sedentary behaviour on mental health among children and adolescents: A systematic review and meta-analysis of longitudinal studies. *Journal of Affective Disorders* **306**, 90–114 (2022).
166. Luo, Y. *et al.* Is Increased Video Game Participation Associated With Reduced Sense of Loneliness? A Systematic Review and Meta-Analysis. *Frontiers in Public Health* **10**, 898338 (2022).
167. Kim, J., Gilbert, J., Yu, Q. & Gale, C. Measures Matter: A Meta-Analysis of the Effects of Educational Apps on Preschool to Grade 3 Children's Literacy and Math Skills. *AERA Open* **7**, 233285842110041 (2021).
168. Liu, M., Pang, W., Guo, J. & Zhang, Y. A Meta-analysis of the Effect of Multimedia Technology on Creative Performance. *Education and Information Technologies* **27**, 8603–8630 (2022).

169. Di, X. & Zheng, X. A meta-analysis of the impact of virtual technologies on students' spatial ability. *Educational technology research and development* **70**, 73–98 (2022).
170. Casale, S. *et al.* A meta-analysis on the association between self-esteem and problematic smartphone use. *Computers in Human Behavior* **134**, 107302 (2022).
171. Shin, M., Juventin, M., Wai Chu, J. T., Manor, Y. & Kemps, E. Online media consumption and depression in young people: A systematic review and meta-analysis. *Computers in Human Behavior* **128**, 107129 (2022).
172. Shannon, H., Bush, K., Villeneuve, P. J., Hellemans, K. G. & Guimond, S. Problematic Social Media Use in Adolescents and Young Adults: Systematic Review and Meta-analysis. *JMIR Mental Health* **9**, e33450 (2022).
173. Cao, X. *et al.* Risk of Accidents or Chronic Disorders From Improper Use of Mobile Phones: A Systematic Review and Meta-analysis. *Journal of Medical Internet Research* **24**, e21313 (2022).
174. Wu, Y., Amirkhahraei, A., Ebrahimzadeh, F., Jahangiry, L. & Abbasalizad-Farhangi, M. Screen Time and Body Mass Index Among Children and Adolescents: A Systematic Review and Meta-Analysis. *Frontiers in Pediatrics* **10**, 822108 (2022).
175. Zhang, Y., Tian, S., Zou, D., Zhang, H. & Pan, C.-W. Screen time and health issues in Chinese school-aged children and adolescents: A systematic review and meta-analysis. *BMC Public Health* **22**, 810 (2022).
176. Garzón, J. & Acevedo, J. Meta-analysis of the impact of Augmented Reality on students' learning gains. *Educational Research Review* **27**, 244–260 (2019).
177. Soo Jung, K. & Yan Ping, X. A Synthesis of Computer-Assisted Mathematical Word Problem-Solving Instruction for Students with Learning Disabilities or Difficulties. *Learning Disabilities: A Contemporary Journal* **20**, 27–45 (2022).
178. Neitzel, A. J., Lake, C., Pellegrini, M. & Slavin, R. E. A Synthesis of Quantitative Research on Programs for Struggling Readers in Elementary Schools. *Reading Research Quarterly* **57**, 149–179 (2022).
179. Liu, M. *et al.* Time Spent on Social Media and Risk of Depression in Adolescents: A DoseResponse Meta-Analysis. *International Journal of Environmental Research and Public Health* **19**, 5164 (2022).
180. Zhang, J. *et al.* An updated of meta-analysis on the relationship between mobile phone addiction and sleep disorder. *Journal of Affective Disorders* **305**, 94–101 (2022).
181. Alimoradi, Z. *et al.* Internet addiction and sleep problems: A systematic review and meta-analysis. *Sleep Medicine Reviews* **47**, 51–61 (2019).
182. Cho, K., Lee, S., Joo, M.-H. & Becker, B. The Effects of Using Mobile Devices on Student Achievement in Language Learning: A Meta-Analysis. *Education Sciences* **8**, 105 (2018).
183. Ferguson, C. J. & Kilburn, J. The Public Health Risks of Media Violence: A Meta-Analytic Review. *The Journal of Pediatrics* **154**, 759–763 (2009).
184. Garzón, J., Pavón, J. & Baldiris, S. Systematic review and meta-analysis of augmented reality in educational settings. *Virtual Reality* **23**, 447–459 (2019).
185. Kong, Y., Seo, Y. S. & Zhai, L. Comparison of reading performance on screen and on paper: A meta-analysis. *Computers & Education* **123**, 138–149 (2018).
186. Saiphoo, A. N., Dahoah Halevi, L. & Vahedi, Z. Social networking site use and self-esteem: A meta-analytic review. *Personality and Individual Differences* **153**, 109639 (2020).
187. Scherer, R., Siddiq, F. & Sánchez Viveros, B. A meta-analysis of teaching and learning computer programming: Effective instructional approaches and conditions. *Computers in Human Behavior* **109**, 106349 (2020).

188. Marino, C., Gini, G., Vieno, A. & Spada, M. M. The associations between problematic Facebook use, psychological distress and well-being among adolescents and young adults: A systematic review and meta-analysis. *Journal of Affective Disorders* **226**, 274–281 (2018).
189. Clinton, V. Reading from paper compared to screens: A systematic review and meta-analysis. *Journal of Research in Reading* **42**, 288–325 (2019).
190. Wouters, P., van Nimwegen, C., van Oostendorp, H. & van der Spek, E. D. A meta-analysis of the cognitive and motivational effects of serious games. *Journal of Educational Psychology* **105**, 249–265 (2013).
191. Shudong Wang, Hong Jiao, Young, M. J., Brooks, T. & Olson, J. Comparability of Computer-Based and Paper-and-Pencil Testing in K Reading Assessments: A Meta-Analysis of Testing Mode Effects. *Educational and Psychological Measurement* **68**, 5–24 (2008).
192. Powers, K. L., Brooks, P. J., Aldrich, N. J., Palladino, M. A. & Alfieri, L. Effects of video-game play on information processing: A meta-analytic investigation. *Psychonomic Bulletin & Review* **20**, 1055–1079 (2013).
193. Sung, Y.-T., Chang, K.-E. & Yang, J.-M. How effective are mobile devices for language learning? A meta-analysis. *Educational Research Review* **16**, 68–84 (2015).
194. Vahedi, Z. & Zannella, L. The association between self-reported depressive symptoms and the use of social networking sites (SNS): A meta-analysis. *Current Psychology* **40**, 2174–2189 (2021).
195. Mei, X. *et al.* Sleep problems in excessive technology use among adolescent: A systemic review and meta-analysis. *Sleep Science and Practice* **2**, 9 (2018).
196. Tsai, Y.-L. & Tsai, C.-C. Digital game-based second-language vocabulary learning and conditions of research designs: A meta-analysis study. *Computers & Education* **125**, 345–357 (2018).
197. Marciano, L., Schulz, P. J. & Camerini, A.-L. Cyberbullying Perpetration and Victimization in Youth: A Meta-Analysis of Longitudinal Studies. *Journal of Computer-Mediated Communication* **25**, 163–181 (2020).
198. Zheng, B., Warschauer, M., Lin, C.-H. & Chang, C. Learning in One-to-One Laptop Environments: A Meta-Analysis and Research Synthesis. *Review of Educational Research* **86**, 1052–1084 (2016).
199. Lamb, R. L., Annetta, L., Firestone, J. & Etopio, E. A meta-analysis with examination of moderators of student cognition, affect, and learning outcomes while using serious educational games, serious games, and simulations. *Computers in Human Behavior* **80**, 158–167 (2018).
200. Liu, D. & Baumeister, R. F. Social networking online and personality of self-worth: A meta-analysis. *Journal of Research in Personality* **64**, 79–89 (2016).
201. Liu, D., Ainsworth, S. E. & Baumeister, R. F. A Meta-Analysis of Social Networking Online and Social Capital. *Review of General Psychology* **20**, 369–391 (2016).
202. Merchant, Z., Goetz, E. T., Cifuentes, L., Keeney-Kennicutt, W. & Davis, T. J. Effectiveness of virtual reality-based instruction on students' learning outcomes in K-12 and higher education: A meta-analysis. *Computers & Education* **70**, 29–40 (2014).
203. Mori, C., Temple, J. R., Browne, D. & Madigan, S. Association of Sexting With Sexual Behaviors and Mental Health Among Adolescents: A Systematic Review and Meta-analysis. *JAMA Pediatrics* **173**, 770 (2019).
204. Tokac, U., Novak, E. & Thompson, C. G. Effects of game-based learning on students' mathematics achievement: A meta-analysis. *Journal of Computer Assisted Learning* **35**, 407–420 (2019).
205. Tokunaga, R. S. A meta-analysis of the relationships between psychosocial problems and internet habits: Synthesizing internet addiction, problematic internet use, and deficient self-regulation research. *Communication Monographs* **84**, 423–446 (2017).
206. Wang, C.-p., Lan, Y.-J., Tseng, W.-T., Lin, Y.-T. R. & Gupta, K. C.-L. On the effects of 3D virtual worlds in language learning a meta-analysis. *Computer Assisted Language Learning* **33**, 891–915 (2020).

207. Wouters, P. & van Oostendorp, H. A meta-analytic review of the role of instructional support in game-based learning. *Computers & Education* **60**, 412–425 (2013).
208. Yin, X.-Q., de Vries, D. A., Gentile, D. A. & Wang, J.-L. Cultural Background and Measurement of Usage Moderate the Association Between Social Networking Sites (SNSs) Usage and Mental Health: A Meta-Analysis. *Social Science Computer Review* **37**, 631–648 (2019).
209. Yoon, S., Kleinman, M., Mertz, J. & Brannick, M. Is social network site usage related to depression? A meta-analysis of FacebookDepression relations. *Journal of Affective Disorders* **248**, 65–72 (2019).

Effect Size Characteristics

Characteristics of included and excluded effect sizes

Variable	Effect Size Used	
	Not Used, N = 197 ¹	Used, N = 255 ¹
Review Year		
1982	0 (0%)	1 (0.4%)
1994	0 (0%)	3 (1.2%)
2002	0 (0%)	1 (0.4%)
2003	0 (0%)	1 (0.4%)
2004	4 (2.0%)	13 (5.1%)
2005	0 (0%)	4 (1.6%)
2008	0 (0%)	1 (0.4%)
2009	0 (0%)	2 (0.8%)
2010	0 (0%)	2 (0.8%)
2011	3 (1.5%)	3 (1.2%)
2012	1 (0.5%)	2 (0.8%)
2013	4 (2.0%)	12 (4.7%)
2014	1 (0.5%)	7 (2.7%)
2015	8 (4.1%)	16 (6.3%)
2016	16 (8.1%)	9 (3.5%)
2017	10 (5.1%)	8 (3.1%)
2018	6 (3.0%)	16 (6.3%)
2019	38 (19%)	50 (20%)
2020	25 (13%)	49 (19%)
2021	28 (14%)	24 (9.4%)
2022	53 (27%)	31 (12%)
Outcome Category		
Education	41 (21%)	89 (35%)
Health Behaviour	55 (28%)	64 (25%)
Physical Health	62 (31%)	32 (13%)
Psychology	39 (20%)	69 (27%)
(missing)	0	1
Broad Outcome		
Aggression	0 (0%)	4 (1.6%)
Antisocial Behaviour	0 (0%)	3 (1.2%)
Body composition	45 (23%)	26 (10%)
Cardiometabolic health	4 (2.0%)	3 (1.2%)
Cognition	10 (5.1%)	21 (8.2%)
Developmental	0 (0%)	5 (2.0%)
Diet	17 (8.6%)	15 (5.9%)
Eye health	10 (5.1%)	0 (0%)
Healthy behavior	1 (0.5%)	4 (1.6%)
Learning	29 (15%)	44 (17%)
Literacy	10 (5.1%)	33 (13%)
Numeracy	2 (1.0%)	11 (4.3%)
Physical activity	18 (9.1%)	21 (8.2%)
Physical health	3 (1.5%)	1 (0.4%)
Prosocial Behavior	0 (0%)	3 (1.2%)
Psychological health	23 (12%)	26 (10%)
Risky behavior	10 (5.1%)	7 (2.7%)
Science	0 (0%)	1 (0.4%)
Screen time	3 (1.5%)	4 (1.6%)
Self-perceptions	1 (0.5%)	2 (0.8%)
Sleep	11 (5.6%)	20 (7.8%)
Social interactions	0 (0%)	1 (0.4%)
Broad Exposure		
Advertising	14 (7.1%)	5 (2.0%)
Computer use	9 (4.6%)	11 (4.3%)
e-Books	0 (0%)	5 (2.0%)
Internet use	1 (0.5%)	7 (2.7%)
Screen use	77 (39%)	48 (19%)
Screen-based intervention	56 (28%)	92 (36%)
Social Media	6 (3.0%)	10 (3.9%)
TV advertising	1 (0.5%)	0 (0%)
TV programs and movies	10 (5.1%)	32 (13%)
Video games	23 (12%)	45 (18%)
Number of Contributing Studies	5 (3, 9)	9 (5, 16)
(missing)	9	3
Pooled Sample Size	1,884 (665, 8,487)	2,053 (744, 5,990)
Age Group		
Adolescents	21 (11%)	57 (22%)
Children	47 (24%)	76 (30%)
Mixed	114 (58%)	102 (40%)
Young children	15 (7.6%)	20 (7.8%)
Sample Type		
Atypically developing	1 (0.5%)	3 (1.2%)
Autism	6 (3.0%)	1 (0.4%)
Chronic disease	1 (0.5%)	4 (1.6%)
Dyscalculia	0 (0%)	1 (0.4%)
General	184 (93%)	231 (91%)
Math difficulties	1 (0.5%)	2 (0.8%)
Overweight and obese	4 (2.0%)	10 (3.9%)
Poor readers	0 (0%)	3 (1.2%)
Study Design		
Cross-sectional only	4 (2.0%)	16 (6.3%)
Experimental	108 (55%)	130 (51%)
Longitudinal only	8 (4.1%)	12 (4.7%)
Mixed or unspecified	48 (24%)	81 (32%)
Observational - mixed	29 (15%)	16 (6.3%)
Study-level Data Available	150 (76%)	188 (74%)
Meets Statistical Certainty Criteria		
Meets Criteria	8 (4.1%)	44 (17%)
Unclear	189 (96%)	211 (83%)

¹ n (%); Median (IQR)