Supporting Information

Table S1. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist

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| --- | --- | --- | --- |
| **Section/ topic** | **#** | **Checklist item** | **Location reported** |
| **TITLE** |
| Title  | 1 | Identify the report as a systematic review, meta-analysis, or both.  | Title page |
| **ABSTRACT** |
| Structured summary  | 2 | Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.  | Abstract |
| **INTRODUCTION** |
| Rationale  | 3 | Describe the rationale for the review in the context of what is already known.  | Introduction |
| Objectives  | 4 | Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).  | Introduction |
| **METHODS**  |
| Protocol and registration  | 5 | Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.  | Protocol (methods) |
| Eligibility criteria  | 6 | Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.  | Inclusion criteria (methods, article selection) |
| Information sources  | 7 | Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.  | Search strategy (methods) |
| Search  | 8 | Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.  | Supporting information: Search terms and search strategy |
| Study selection  | 9 | State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).  | Inclusion criteria and screening process (methods) |
| Data collection process  | 10 | Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.  | Data extraction (methods) |
| Data items  | 11 | List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.  | Supporting information: Narrative review data extraction sheet headings; Meta-analysis data extraction sheet headings |

*Table S1 continued below.*

| Table S1 (continued). Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist |
| --- |
| **Section/ topic** | **#** | **Checklist item** | **Location reported** |
| Risk of bias in individual studies  | 12 | Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.  | Risk of bias assessment (methods) and Supporting information: Risk of bias assessment |
| Summary measures  | 13 | State the principal summary measures (e.g., risk ratio, difference in means).  | Data extraction (methods) |
| Synthesis of results  | 14 | Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I2) for each meta-analysis.  | Statistical analyses (methods) |
| Risk of bias across studies  | 15 | Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).  | Analyses (methods) |
| Additional analyses  | 16 | Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.  | Statistical analyses (methods) |
| **RESULTS**  |
| Study selection  | 17 | Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.  | Results and Figure 1 |
| Study characterist-ics  | 18 | For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.  | Description of articles (results, narrative review) and Supporting information: Table S3 |
| Risk of bias within studies  | 19 | Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).  | Description of articles (results, narrative review) and Supporting information: Table S4 |
| Results of individual studies  | 20 | For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.  | Associations between social norms and smoking initiation and escalation (results, narrative review) and Supporting information: Table S5-S7 |
| Synthesis of results  | 21 | Present results of each meta-analysis done, including confidence intervals and measures of consistency.  | Associations between social norms and smoking initiation (results, meta-analyses) |
| Risk of bias across studies  | 22 | Present results of any assessment of risk of bias across studies (see Item 15).  | Publication bias (results, meta-analyses) |
| Additional analysis  | 23 | Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).  | Meta-regression (results, meta-analyses) |
| **DISCUSSION**  |
| Summary of evidence  | 24 | Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).  | Discussion |
| Limitations  | 25 | Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).  | Limitations (discussion) |
| Conclusions  | 26 | Provide a general interpretation of the results in the context of other evidence, and implications for future research. | Conclusions (discussion) |
| **FUNDING**  |
| Funding  | 27 | Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review. | Title page |

*From:* Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097. [www.prisma-statement.org](http://www.prisma-statement.org).

Search terms and search strategy

*MEDLINE (via PubMed):* (Smok\*[MeSH]) OR Tobacco[MeSH] OR Cigarette[MeSH] or Cigarettes[MeSH]) AND (attitude\*[tiab] OR belief\*[tiab] OR believe\*[tiab] OR perception\*[tiab] OR perceive\*[tiab] OR norm\*[tiab] OR renorm\*[tiab] OR denorm\*[tiab] OR opinion\*[tiab] OR motivat\* [tiab] OR approv\*[tiab] OR disapprov\*[tiab] OR accept\*[tiab] OR societ\*[tiab] OR social\*[tiab] OR \*stigma\*[tiab] OR prejudice\*[tiab] OR stereotyp\*[tiab]) AND (youth\*[tiab] OR school\*[tiab] OR adolescen\*[tiab] OR young people\*[tiab] OR young person\*[tiab] OR young adult\*[tiab] OR child\*[tiab] OR teenage\*[tiab]) AND (longitudinal\*[tiab] OR prospective[tiab] OR cohort\*[tiab] OR follow-up\*[tiab] OR follow up\*[tiab] OR baseline[tiab] OR wave\*[tiab] OR panel\*[tiab] OR predict\*[tiab])

*EMBASE and PsycINFO (via Ovid):* (Smok\* or tobacco\* or cigarette\*).sh. and (attitude\* or belief\* or believe\* or perception\* or perceive\* or norm\* or renorm\* or denorm\* or opinion\* or motivat\* or approv\* or disapprov\* or accept\* or societ\* or social\* or \*stigma\* or prejudice\* or stereotyp\*).ti,ab. and (youth\* or school\* or adolescen\* or young people or young person\* or young adult\* or child\* or teenage\*).ti,ab. and (longitudinal\* or prospective or cohort\* or follow-up\* or follow up\* or baseline or wave\* or panel\* or predict\*).ti,ab.

*CINAHL (via EbscoHost):* (MW smok\* OR MW tobacco\* OR MW cigarette\*) AND (TI attitude\* OR AB attitude\* OR TI belief\* OR AB belief\* OR TI believe\* OR AB believe\* OR TI peception\* OR AB peception\* OR TI perceive\* OR AB perceive\* OR TI norm\* OR AB norm\* OR TI renorm\* OR AB renorm\* OR TI denorm\* OR AB denorm\* OR TI opinion\* OR AB opinion\* OR TI motivat\* OR AB motivat\* OR TI approv\* OR AB approv\* OR TI disapprov\* OR AB disapprov\* OR TI accept\* OR AB accept\* OR TI societ\* OR AB societ\* OR TI social\* OR AB social\* OR TI \*stigma\* OR AB \*stigma\* OR TI prejudice\* OR AB prejudice\* OR TI stereotyp\* OR AB stereotyp\*) AND (TI youth\* OR AB youth\* OR TI school\* or AB school\* OR TI adolescen\* OR AB adolescen\* OR TI young people OR AB young people OR TI young person OR AB young person OR TI young adult\* OR AB young adult\* OR TI child\* OR AB child\* OR TI teenage\* AB teenage\*) AND (TI longitudinal\* OR AB longitudinal\* OR TI prospective OR AB prospective OR TI cohort\* OR AB cohort\* OR TI follow-up\* OR AB follow-up\* OR TI follow up\* OR AB follow up\* OR TI baseline OR AB baseline OR TI wave\* OR AB wave\* OR TI panel OR AB panel\* OR TI predict\* OR AB predict\*)

All searches were limited to: 01/01/1998 – 13/10/2020, human, English language.

Reference lists of included articles and relevant reviews were also screened to identify further articles.

Narrative review data extraction sheet headings

*Article description:* Authors, title, year of publication, journal, objectives, type (e.g., peer-reviewed journal article, thesis), dataset, theoretical basis, conflicts of interest.

*Design:* Location (country, area), setting, population, sampling strategy, study inclusion/exclusion criteria, method of data collection, year of data collection at baseline, number of waves, length of longest follow-up.

*Respondents:* Number of respondents in analyses, age at baseline (range, mean and standard deviation), % female at baseline, ethnicity at baseline, socio-economic status at baseline, smoking status at baseline.

*Exposure(s):* All self-reported measures of norms assessed and details on wording and coding.

*Outcome(s):* Smoking initiation/escalation outcome(s) assessed and details on wording and coding.

*Analyses and result(s):* Description of associations between norms and smoking initiation/escalation provided in the article (at longest follow-up), analyses used, variables adjusted for.

*Potential sources of bias:* Response rate, attrition rate, details of attrition analyses, method of dealing with missing, Newcastle-Ottawa Scale score, other potential sources of bias or attempts to address bias.

Meta-analysis data extraction sheet headings

*Article description:* Authors, title, year of publication, journal, type (e.g., peer-reviewed journal article, thesis), conflicts of interest.

*Design:* Location (country, area), setting, population, sampling strategy, method of data collection, year of data collection at baseline, length of follow-up.

*Respondents:* Number of respondents in analyses, age at baseline (range, mean and standard deviation), % female at baseline, % white at baseline.

*Outcome(s):* Measurement and coding of smoking initiation.

*Analyses and result(s):* Parent smoking: OR, low CI, high CI; Sibling smoking: OR, low CI, high CI; Close friend smoking: OR, low CI, high CI; Peer prevalence: OR, low CI, high CI; Household/Family smoking: OR, low CI, high CI; Adult smoking prevalence: OR, low CI, high CI; Parent approval: OR, low CI, high CI; Sibling approval: OR, low CI, high CI; Friend/peer approval: OR, low CI, high CI; Public approval: OR, low CI, high CI; Important people approval: OR, low CI, high CI; Pressure parents: OR, low CI, high CI; Pressure siblings: OR, low CI, high CI; Pressure friends: OR, low CI, high CI.

*Potential sources of bias:* Newcastle-Ottawa Scale score.

Description of risk of bias assessment

The Newcastle-Ottawa Scale was used as instructed in Taylor et al. [43] except “Ascertainment of outcome” and “Ascertainment of exposure” were switched so that “Ascertainment of outcome” was awarded one star if smoking status was bio-verified and “Ascertainment of exposure” was awarded one star if standardised (or validated or reliable, additional to [43]) self-report measures of norms were used [43]. “Representativeness of the exposed cohort” was awarded one star if the sample was truly or somewhat representative of average youth in the community assessed. “Selection of the non-exposed cohort” was awarded one star if the sample of the non-exposed cohort was drawn from the same community as the exposed cohort. Finally, “Adequacy of follow-up of cohorts” was awarded one star if >70% were followed-up (threshold recommended in [43]) or there was a description of respondents lost to follow-up.

Table S2. Details of articles excluded because of sample multiplicity.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Ref (see list below)** | **Peer reviewed** | **Longest follow-up** | **Sample N** | **Social norms measured** | **Smoking outcome** | **Duplicated included article** | **Primary reason for exclusion in favour of other articles** |
| Allem 2015 | Yes | 60 | 932 | Parent and sibling smoking, peer smoking prevalence, friend approval of smoking | Escalation: Change in past-month smoking | Valente 2013 [68] | [68] prioritised as outcome was smoking initiation. |
| Choi 2011 (Manuscript 3) | No(thesis) | 78 | 3112 | Adult smoking prevalence | Escalation: Escalation in smoking stage | Bernat 2008 [54] Bernat 2012 [55] | [54] and [55] prioritised as they were peer-reviewed, and could both be included as they used different data waves. |
| Conner 2006(Study 2) | Yes | 24 | 674 | Grouped approval of smoking (friends, people important to me) | Initiation: Carbon monoxide level | Grogan 2009 [63] | [63] prioritised because it assessed smoking initiation as a binary yes/no outcome, consistent with most other studies in this review and hence reducing heterogeneity. |
| McMillan 2005 | Yes | 3 | 620 | Friend and family smoking, grouped approval of smoking (friends/important people) | Escalation: Ever smoked in past school term | Grogan 2009 [63] | [63] prioritised as outcome was smoking initiation. |
| Dalton 2009 | Yes | 96 | 1791 | Parent, sibling, friend smoking, parent approval of smoking | Initiation: >100 cigarettes in life | Dalton 2003 [60] | [60] prioritised as longer follow-up. |
| Sargent 2008 | Yes | 26 | 2603 | Family and friend smoking, parent approval of smoking | Initiation: Any smoking | Dalton 2003 [60] | [60] prioritised as more norms assessed. |
| Sargent 2004 | Yes | 26 | 2596 | Family and friend smoking, parent approval of smoking | Initiation: Any smoking | Dalton 2003 [60] | [60] prioritised as more norms assessed. |
| Tickle 2006 | Yes | 26 | 2541 | Parent, sibling, friend smoking, peer and adult smoking prevalence | Initiation: Any smoking | Dalton 2003 [60] | This article was initially prioritised because it assessed the greatest number of norms. However, summary statistics for the association between norms and smoking initiation could not be calculated or obtained. [60] was hence prioritised because it assessed the second greatest number of norms. |
| Kremers 2004 | Yes | 12 | 6729 | Parent, sibling, friend/peer smoking, parent, sibling, friend/peer approval of smoking*,* pressure to smoke from parents, siblings, friends | Escalation: Escalation from less-than-weekly smokers at baseline | Hoving 2007 [64] | [64] prioritised as outcome was smoking initiation. |
| Mercken 2011 | Yes | 24 | 1475 | Parent and sibling smoking, parent, sibling, and friend/peer approval of smoking, pressure to smoke from friends | Escalation: Cigarettes per week | Hoving 2007 [64] | [64] prioritised as outcome was smoking initiation. |
| Van de Ven 2007 | Yes | 18 | 4079 | Parent and friend approval of smoking | Initiation: Any smoking | Otten 2008 [66] | This article was initially prioritised because it assessed the greatest number of injunctive norms. However, summary statistics for the association between norms and smoking initiation could not be calculated or obtained. [66] was thus prioritised. |
| Kintz 2020 | Yes | 16 | 1293 | Grouped norms (household and friend smoking, friend approval of smoking) | Initiation: Any smoking | Barrington-Trimis 2016 [53] | [53] was prioritised because it assessed the greatest number of separate norms measures. |

References of articles excluded because of sample multiplicity

Allem JP, Soto DW, Baezconde-Garbanati L, Sussman S, Unger JB. Cultural and social influences on adolescent smoking dissipate by emerging adulthood among Hispanics in Southern California. J Immigr Minor Health. 2015;17:192-197. 10.1007/s10903-013-9910-9.

Choi TCK. From the silver screen to teens: Describing the prevalence of smoking in movies as perceived by teenagers and exploring the underlying mechanism of the association between smoking in movies and adolescent smoking: A longitudinal analysis. US: ProQuest Information & Learning; 2011.

Conner M, Sandberg T, McMillan B, Higgins A. Role of anticipated regret, intentions and intention stability in adolescent smoking initiation. Br J Health Psychol. 2006;11:85-101. 10.1348/135910705X40997.

Dalton MA, Beach ML, Adachi-Mejia AM, Longacre MR, Matzkin AL, Sargent JD, et al. Early exposure to movie smoking predicts established smoking by older teens and young adults. Pediatrics. 2009;123(4):e551-558. 10.1542/peds.2008-2102.

Sargent JD, Gibson J, Heatherton TF. Comparing the effects of entertainment media and tobacco marketing on youth smoking. ‎Tob Control. 2009;18:47-53 47p. 10.1136/tc.2008.026153.

Kintz N, Liu M, Chou C-P, Urman R, Berhane K, Unger JB, et al. Risk factors associated with subsequent initiation of cigarettes and e-cigarettes in adolescence: A structural equation modeling approach. Drug Alcohol Depend. 2020;207. http://dx.doi.org/10.1016/j.drugalcdep.2019.107676.

Kremers SPJ, Mudde AN, De Vries H. Model of unplanned smoking initiation of children and adolescents: An integrated stage model of smoking behavior. Prev Med. 2004;38:642-650. 10.1016/j.ypmed.2003.12.003.

McMillan B, Higgins AR, Conner M. Using an extended Theory of Planned Behaviour to understand smoking amongst schoolchildren. Addict Res Theory. 2005;13:293-306. 10.1080/16066350500053679.

Mercken L, Candel M, van Osch L, de Vries H. No smoke without fire: The impact of future friends on adolescent smoking behaviour. Br J Health Psychol. 2011;16:170-188. 10.1348/135910710X531608.

Sargent JD, Beach ML, Dalton MA, Ernstoff LT, Gibson JJ, Tickle JJ, et al. Effect of parental R-rated movie restriction on adolescent smoking initiation: A prospective study. Pediatrics. 2004;114:149-156. 10.1542/peds.114.1.149.

Tickle JJ, Hull JG, Sargent JD, Dalton MA, Heatherton TF. A structural equation model of social influences and exposure to media smoking on adolescent smoking. Basic Appl Soc Psych. 2006;28:117-129. 10.1207/s15324834basp2802\_2.

Van De Ven MOM, Engels RCME, Otten R, Van Den Eijnden RJJM. A longitudinal test of the Theory of Planned Behavior predicting smoking onset among asthmatic and non-asthmatic adolescents. J Behav Med. 2007;30:435-445. 10.1007/s10865-007-9119-2.

Table S3. Description of the 30 articles included in the narrative review and meta-analysis. Abbreviations are defined in footnote.

| **Ref** | **Design, country, months’ follow-up** | **Sample** | **Measures** | **Analysis (covariates)** | **NOS** |
| --- | --- | --- | --- | --- | --- |
| **Social norms (coding)** | **Smoking outcome (coding)** |
| **INCLUDED IN NARRATIVE REVIEW AND META-ANALYSIS** |
| Barrington-Trimis 2016 [53] | WS/DS Schools US16 | N=298Mean age 17.4 †42% female49% Hispanic42.3% white | *Friend smoking:* At least one of four closest friends smoke*Household smoking:* Anyone who lives with you smokes*Friend approval:* Best friends are ‘friendly’ towards you if you smoked | Initiation: Any smoking | LogR (AP, E, G, SES) | 3 |
| Bernat 2008 [54] | TS HouseholdsUS36 | N=3637Age 12-16 †51% female84% white | *Parent smoking:* Have a parent who smokes*Friend smoking:* Number of four closest friends who smoke (0-4; continuous)*Peer smoking prevalence:* Prevalence of smoking among teenagers the same age as respondent (0-4; none-almost all; continuous)*Adult smoking prevalence:* Prevalence of smoking among adults (0-4; none-almost all; continuous) | Escalation: Trajectories | LogR (A, E, FS, HSR, L, N, TIP, TPB) | 4 |
| Bernat 2012 [55] | TS HouseholdsUS36 | N=2034Age 18-21 †51% female89% white | *Friend smoking:* Number of four closest friends who smoke (0-4; continuous)*Peer smoking prevalence:* Prevalence of smoking among teenagers the same age as respondent (0-4; none-almost all; continuous)*Household smoking:* Anyone in household smokes*Adult smoking prevalence:* Prevalence of smoking among adults (0-4; none-almost all; continuous)*Parent approval:* Smoking would bother parents a lot | Initiation: Any smoking | T-test, X2, LogR (A, E, G, L, N, SX, TPB) | 3 |
| Bidstrup 2009 [56] | WS SchoolsDenmark18 | N=442Mean age 13 †53% femaleEthnicity not stated | *Parent smoking: Mother:* Mother smokes. *Father:* Father smokes*Friend smoking:* Best friend smokes*Grouped approval:* Teachers, friends, best friend think…(for each: it’s OK to smoke, think I shouldn’t smoke, don’t care/don’t know; combined to form continuous scale from 1-4)*Pressure friend/peer:* Pressure to smoke by friends/best friends/other adolescents (for each: yes, no; combined to form continuous scale from 1-4) | Initiation: Any smoking | LogR (FS, LS, N, R, TPB) | 3 |
| Chang 2006 [57] | WS SchoolsTaiwan24 | N=1654Age 15-16 †42% femaleEthnicity not stated | *Parent smoking:* Have a parent who smokes*Friend smoking: Best friend:* Best friend smokes. *Friends:* Over half of friends smoke.*Parent approval:* Parents disapprove of smoking*Friend approval:* Friends disapprove of smoking*Public approval:* Community disapproves of smoking | Initiation: Any smoking in the past year among past-year never smokers | LogR (N, PB, peer offers cigarettes, TPB) | 4 |
| Chassin 2005 [58] | FS/TS HouseholdsUS24 | N=382Age 10-17 (mean=13)51% female98% white | *Parent smoking:* Have a parent who smokes*Parent approval:* Eight items, e.g. parents would discuss talk to respondent about reasons not to smoke if they found out respondent smoked; parents would withdraw privileges if they found out respondent smoked (both: 1-5; no way-yes definitely; continuous) | Escalation: Increase in smoking from being a never smoker or less-than-monthly smoker at baseline (yes, no) | LogR (A, BS, FS, N, SES) | 5 |

*Table S3 continued below.*

| Table S3 (continued). Description of the 30 articles included in the narrative review and meta-analysis. Abbreviations are defined in footnote. |
| --- |
| **Ref** | **Design, country, months’ follow-up** | **Sample** | **Measures** | **Analysis (covariates)** | **NOS** |
| **Social norms (coding)** | **Smoking outcome (coding)** |
| Conner 2017 [59] | WS SchoolsGB12 | N=2044Age 13-14 (mean=13)51% femaleEthnicity not stated | *Family smoking:* Number of family members who smoke (0, 1, 2, 3+)*Friend smoking:* Proportion of friends who smoke (none, a few, most)*Grouped approval:* Most friends, best male friend, best female friend, family, people important to me think I…(for each: 1-5, should smoke to should not smoke; mean taken to form continuous scale) | 1. Initiation: Any smoking2. Escalation: Initiation of rarely, occasional, or frequent smoking from having tried or used to smoke | LogR (EC, G, ITS, N, SES, TBP) | 5 |
| Dalton 2003 [60] | WS/TS SchoolsUS26 | N=2603Age 10-14 (mean=12)53% female94% white | *Parent smoking:* Have a parent who smokes*Sibling smoking:* Have a sibling who smokes*Friend smoking:* Have friends who smoke*Parent approval:* Neither/one parent would disapprove of smoking (vs. both would disapprove) | Initiation: Any smoking | LogR (A, G, school) | 3 |
| Doubeni 2008 [61] | FS SchoolsUS48 | N=1195Age 11-14 (mean=12)52% female73% white | *Parent smoking:* Have a parent who smokes*Household smoking:* Presence of adult smokers in home*Friend smoking:* How many of respondents four closest friends smoke (0-4)*Parent approval:* Parents would be upset if you smoked*Friend approval:* Friends would be happy if you smoked | 1. Initiation: Any smoking2. Escalation: Initiation of ≥weekly smoking from baseline never/less-than-weekly smoking | Survival analyses (A, CA, concerns about weight, G, LS, N, PB, PS) | 2 |
| East 2018 [62] | DS Online surveyGB6 | N=923Age 11-18 †54% femaleEthnicity not stated | *Parent smoking:* Have a parent who smokes*Sibling smoking:* Have a sibling who smokes*Friend smoking:* Have some friends who smoke*Public approval:* The public approve of smoking | Initiation: Any smoking | LogR (A, AP, EC, ECN, G, ITS, N, PB) | 4 |
| Grogan 2009 [63] | WS SchoolsGB48 | N=590Age 11 †53% femaleEthnicity not stated | *Grouped approval:* My friend, best friend, family thinks respondent… (for each: 1-5, should smoke to should not smoke; combined to form continuous scale) | Initiation: Any past-term smoking | LogR (TPB) | 5 |
| Hoving 2007 [64] | WS SchoolsFinland, Denmark, the United Kingdom, the Netherlands, Spain, and Portugal12 | N=4055Mean age 13 †49% female92% autochthonous | *Parent smoking:* Have a parent who smokes*Friend smoking:* At least half of friends smoke*Parent approval:* Mother and father think respondent…(for each: 0-6; definitely should not-definitely should smoke)\**Friend approval:* Friends think respondent…(0-6; definitely should not-definitely should smoke; continuous)*Pressure parent:* Pressure to smoke from mother/father (for each: 0-4; never-very often)\**Pressure friend:* Pressure to smoke from friends (for each: 0-4; never-very often)\*\*Mean taken for each set of norms to form a continuous scale. | Initiation: At-least-monthly smoking | LogR (A, ITS, L, N, PB, R, SES, TPB) | 3 |
| *Table S3 continued below.* |
| Hukkelberg 2009 [65] | WS SchoolsNorway12 | N=760Mean age 14 †50% femaleEthnicity not stated | *Grouped approval:* People important to me think I should not smoke (1-7; disagree-agree; continuous) | Escalation: Smoking stage (every day, 3–5 times a week, 1–2 times a week, seldom, quit, never smoked) | SEM (BS, TPB) | 2 |
| Otten 2008 [66] | WS SchoolsThe Netherlands24 | N=4351Age 11-16 (mean=13)53% female56% White | *Parent smoking:* Parents smoke (both, one, neither)*Parent approval:* Parents allow smoking in the house; parents would not find out if respondent smoked; respondent expects negative consequences parents found out about them smoking; parents often talk with respondent about not smoking; respondent disregards explicit requests of parents not to smoke (all: 1-5; definitely not true-definitely true; summed to form continuous scale) | Initiation: Any smoking | SEM (A, AP, G, N, PS) | 3 |
| Shete 2017 [67] | FS/DS HouseholdsUS60 | N=973Age 11-14 (mean=12)52% female100% Mexican-American | *Friend smoking:* Have at least a few friends who smoke*Household smoking:* Father/mother/brother/sister/anyone else living at home smokes*Adult smoking prevalence:* At least a few of your parents’ friends smoke | Initiation: Any smoking | LogR (A, FS, G, ITS, L, MH, N, SES, SX, language) | 2 |
| Valente 2013 [68] | WS SchoolsUS12 | N=1950Age 14 †59% female80% Hispanic/ Latino | *Friend smoking:* Number (0-5; continuous) and proportion of five closest friends who smoke (%; continuous)*Peer smoking prevalence:* Percentage of students the same as respondents who smoke (0-100 in intervals of 10, e.g. 0, 10, 20…; continuous) | 1. Initiation: Any smoking2. Escalation: Any smoking while controlling for baseline never vs. any smoking | LogR (A, AP, BS, E, friendships, G, L, N, SES) | 2 |
| Wang 2011 [69] | WS SchoolsHong Kong24 | N=2171Mean age 8†48% femaleEthnicity not stated | *Parent smoking:* Parent smoking (coding not stated)*Peer smoking prevalence:* What proportion of primary school children in Hong Kong have smoked (none/some, half, majority, all) | Initiation: Any smoking | LogR (A, G, L, school, SHS, N) | 3 |
| **INCLUDED IN NARRATIVE REVIEW ONLY** |
| Carvajal 2006 [70] | WS SchoolsUS10 | N=1137Age 11-14 †55% female43% Latino, 29% white | *Parent approval:* How parents would feel if you smoked and how important it is for you to do what parents want (coding not specified; continuous)*Friend approval:* How best friends and classmates would feel if you smoked and how important it is for you to do what friends want (coding not specified; continuous) | Initiation: Any smoking | LogR (A, AP, E, G, ITS, LS, MH, N, PS, SES, SX, TPB)  | 4 |
|  | Reason excluded from meta-analysis: Summary statistics for the association between norms and smoking initiation could not be obtained or calculated and were not provided by article’s authors. |
| *Table S3 continued below.* |
| Colder 2008 [71] | DS/MS UniversityUS8 | N=193Age 18-20 † 48% female95% white | *Family smoking:* Smoking among family in household (0, 1, 2+)*Friend smoking:* Number of five closest school friends who smoke (0-5), How often around school friends while they smoked (not at all, a little, a lot)*Friend smoking:* Smoking of three people you spend the most time with, other than partner (for each: 0-6; does not smoke-smokes a lot; mean taken to form continuous scale)*Peer smoking prevalence:* Prevalence of smoking among students (0-10; continuous)*Friend approval:* Approval of smoking among the three people you spend the most time with, other than partner (for each: 0-6; disapprove strongly-approve strongly; mean taken to form continuous scale) | Escalation: Trajectories (large increasers, small increasers, sporadic smokers, steady decreasers [moderate smoker, low smoker], early decreasers [moderate smoker, low smoker]) | ANOVA and X2 | 2 |
|  | Reason excluded from meta-analysis: Summary statistics for the association between norms and smoking initiation could not be obtained or calculated and were not provided by article’s authors. |
| Etcheverry 2008 [72] | DS UniversityUS9 | N=912Age 17-19 †46% female92% white | *Parent smoking: Mother:* Mother smokes. *Father:* Father smokes*Friend smoking:* Number of five closest friends in high school who smoked (0-5; continuous) and smoking of three people you spend the most time with, other than partner (for each: 0-6; does not smoke-smokes a lot; mean taken to form continuous scale)*Partner smoking:* Partner smokes (0-6; does not smoke-smokes a lot)*Friend approval:* Of the three people you spend the most time with other than partner, would they approve or disapprove of you smoking? (0-6; strong disapproval-strong approval; mean taken to form continuous scale)*Partner approval:* Partner would approve or disapprove of your smoking (0-6; strong disapproval-strong approval) | Escalation: Cigarettes per day among those who had ever tried smoking | GCM (BS, G, N, relationship status) | 2 |
|  | Reason excluded from meta-analysis: Summary statistics for the association between norms and smoking initiation could not be obtained or calculated and were not provided by article’s authors. |
| Glass 2013 [73] | DS UniversityUS9 | N=449Age 17-23 (mean=18)78% female86% white | *Friend smoking:* Percentage of close friends who smoke (0-100; continuous)*Peer smoking prevalence:* Percentage of students at university who smoke (0-100; continuous) | Escalation: Cigarettes per week (continuous) | GCM (A, BS, E, G, MH, N) | 3 |
|  | Reason excluded from meta-analysis: Summary statistics for the association between norms and smoking initiation could not be obtained or calculated and were not provided by article’s authors. |
| *Table S3 continued below.* |
| Grenard 2006 [74] | WS SchoolsChina12 | N=11583Age 12-17 (mean=15)51% female95.4% Han Asian | *Friend smoking:* How many good friends smoke at least once a month? (0-3; none-all; continuous)*Peer smoking prevalence:* Percentage of students your age who smoke (0-100 in intervals of 10, e.g. 0, 10, 20…; continuous) | Escalation: Past-month smoking (yes, no) | MGLM (A, AP, BS, G, ITS, L, MH, N, PB, PS, SES, TPB) | 3 |
|  | Reason excluded from meta-analysis: Summary statistics for the association between norms and smoking initiation could not be obtained or calculated and were not provided by article’s authors. |
| Harakeh 2004 [75] | WS SchoolsThe Netherlands6 | N=1070Age 10-14 (mean=12)49% femaleEthnicity not stated | *Parent smoking:* Have a parent who smokes*Friend approval:* Friends approve of smoking (1-5; definitely not-definitely yes; continuous) | Initiation: Any smoking | SEM (ITS, PS, N, TPB) | 3 |
|  | Reason excluded from meta-analysis: Summary statistics for the association between norms and smoking initiation could not be obtained or calculated and were not provided by article’s authors. |
| Lotrean 2013 [76] | WS SchoolsRomania9 | N=504Age 13-14 (mean=14)53% femaleEthnicity not stated | *Parent smoking: Mother:* Mother smokes. *Father:* Father smokes*Sibling smoking: Sister:* Sister smokes. *Brother:* Brother smokes*Friend smoking:* Friends smoke (0-4; nobody-everybody; continuous); 2. Best friend smokes*Peer smoking prevalence:* People in the same school year smoke (0-4; nobody-everybody; continuous)*Parent approval:* Mother/father thinks respondent should…(for each: 0-6; definitely should not smoke-definitely should smoke)\**Sibling approval:* Brother/sister thinks respondent…(for each: 0-6; definitely should not smoke-definitely should smoke)\**Friend/peer approval:* Friends/best friend/people in the same school year) think respondent… (for each: 0-6; definitely should not smoke-definitely should smoke)\**Pressure parent:* Pressure to smoke from mother/father (for each: 0-4; never-very often)\**Pressure sibling:* Pressure to smoke from brother/sister (for each: 0-4; never-very often)\**Pressure friend/peer:* Pressure to smoke from friends/best friend/people in the same school year (for each: 0-4; never-very often)\*\*Each set of norms combined to form a continuous scale | Escalation: Initiation of at-least-weekly smoking from less-than-weekly smokers at baseline | Correlation and LogR (AP, FS, G, ITS, N, PB, SES, TPB) | 3 |
|  | Reason excluded from meta-analysis: Summary statistics for the association between norms and smoking initiation could not be obtained or calculated and were not provided by article’s authors. |
| *Table S3 continued below.* |
| O’Brien 2018 [77] | WS/DS SchoolsUS48 | N=2659Mean age 16 †55% female56% white | *Friend smoking:* Frequency their five closest friends smoke (never, almost never/sometimes, often/almost always)*Parent approval:* How important it is to parents/guardians that respondent does not use cigarettes (1-7; not at all-extremely) | Escalation: Past month smoking frequency (never, 1-5 times, 6+ times) | Ordinal LogR (BS, E, FS, G, MH, N, PB, PS, school, SES) | 3 |
|  | Reason excluded from meta-analysis: Summary statistics for the association between norms and smoking initiation could not be obtained or calculated and were not provided by article’s authors. |
| Otten 2007 [79] | WS HouseholdsThe Netherlands12 | N=314Age 13-17 (mean=13 younger siblings, 15 older siblings)Gender, ethnicity not stated | *Parent approval:* Mother/father approves of smoking (for each: 1-4; definitely not-definitely)*Friend approval:* Friends approve of smoking (1-4; definitely not-definitely) | Escalation: Smoking stage (never, tried smoking but don’t smoke any more, smoked at least monthly but not any more, occasional, daily) from baseline never smoking | SEM (N, parent self-report smoking and communication about smoking, TPB) | 3 |
|  | Reason excluded from meta-analysis: Summary statistics for the association between norms and smoking initiation could not be obtained or calculated and were not provided by article’s authors. |
| Otten 2009 [78] | WS SchoolsThe Netherlands22 | N=6769Age 11-16 (mean=13)52% femaleEthnicity not stated | *Parent smoking:* At least one parent smokes*Friend smoking: Best friend:* Best friend is a smoker. Friend:Over half of friends smoke*Peer smoking prevalence:* Overestimation of lifetime smoking among adolescents the same age as respondents | Escalation: Smoke at least once a month | LogR (A, BS, education, G, N) | 4 |
|  | Reason excluded from meta-analysis: Summary statistics for the association between norms and smoking initiation could not be obtained or calculated and were not provided by article’s authors. |
| Van den Eijnden 2006 [80] | WS SchoolsThe Netherlands12 | N=612Age 11-13 (mean=12)53% female95% Dutch | *Friend approval:* Best friend/friends would approve of respondent smoking (1-4; definitely not-definitely yes; combined to form continuous scale) | Escalation: Smoking stage | LinR (BS, TPB) | 3 |
|  | Reason excluded from meta-analysis: Summary statistics for the association between norms and smoking initiation could not be obtained or calculated and were not provided by article’s authors. |
| *Table S3 continued below.* |
| Van Zundert 2006 [81] | WS SchoolsThe Netherlands12 | N=397Age 11-15 (mean=12)46% female95% Dutch | *Friend approval:* Best friend/friends would approve of respondent smoking (1-5; certainly not-certainly yes; mean taken to form a continuous scale) | Escalation: Smoking stage among those who had ever tried smoking | LogR (A, AP, E, G, TPB) | 4 |
|  | Reason excluded from meta-analysis: Summary statistics for the association between norms and smoking initiation could not be obtained or calculated and were not provided by article’s authors. |
| Xie 2013 [82] | WS SchoolsChina60 | N=3521Age 12-15 †47% femaleEthnicity not stated | *Parent smoking:* Have a parent who smokes*Peer smoking prevalence:* Proportion of people the same age as respondent who smoke (0-100; continuous)*Parent approval:* 1. How parents would act if you smoked (1-5; very badly-very well; dichotomised but coding not specified), 2. Mother/father would agree if respondent wanted to smoke (1-4; definitely not-definitely yes)*Friend approval:* How friends would act if you smoked (1-5; very badly-very well; dichotomised but coding not specified)*Teacher approval:* How teachers would act if you smoked (1-5; very badly-very well; dichotomised but coding not specified) | Escalation: Trajectories (nonsmoker, stable light/ occasional smoker, accelerating smoker) | GCM (AP, FS, G, L, MH, N, PB, PS, school, SES, TPB) | 4 |
|  | Reason excluded from meta-analysis: Summary statistics for the association between norms and smoking initiation could not be obtained or calculated and were not provided by article’s authors. |

NOS=Newcastle-Ottawa Scale, score out of 5 stars with a score of ≤3 stars indicating high risk of bias. *Design*: WS=Written Survey, TS=Telephone Survey, DS=Digital Survey, MS=Mail Survey, FS=Face-to-face Interview Survey. *Country:* GB=Great Britain, US=United States. *Demographics:* M=Months,SD=Standard Deviation, Y=Years. *Analysis:* ANOVA=Analysis of Variance, GCM=Growth Curve Models, LogR=Logistic Regression (or similar form, e.g. general linear model with log link), LinR=Linear Regression, MGLM=Multilevel Generalised Linear Model, SEM=Structural Equation Modelling, X2=Chi Squared. *Covariates*: A=Age, AP=Academic Performance, BS=Baseline Smoking, CA=Cigarette Accessibility, E=Ethnicity, EC=Vaping, ECN=Vaping norms, ED=Education, FS=Family Structure/relationships, G=Gender, HSR=Home Smoking Restrictions, ITS=Intention/susceptibility To Smoke, L=Location, LS=Liking School/positive school experiences, MH=Mental Health, MSE=Movie Smoking Exposure, N=Norms, PB=Problem Behaviour (includes alcohol/drug use, sensation-seeking, rebelliousness), PS=Parenting Style, R=Religion/culture, RTA=Receptivity to Tobacco Advertising, SE=Self-Esteem, SX=Smoking expectancies, SES=Socio-Economic Status, SHS=exposure to Second-Hand Smoke, TIP=Tobacco Industry Perceptions, TPB=Theory of Planned Behaviour measures (attitude, self-efficacy, perceived behavioural control, anticipated regret).

Table S4. Scores on the adapted 5-star Newcastle-Ottawa Quality Assessment Scale for Cohort Studies (adapted from [43]) for the 30 articles included in the narrative review and meta-analysis. Scores range from 0-5 stars, with ≤3 stars indicating high risk of bias.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Ref and total number of stars (\*)** | **Representativeness of exposed cohort*****One star*** if (a) truly, or (b) somewhat, representative of average youth in the community. ***No star*** if (c) selected group e.g., nurses, volunteers, socio-economic groups/areas, or (d) no description | **Selection of non-exposed cohort*****One star*** if (a) drawn from the same community as the exposed cohort. ***No star*** if (b) drawn from a different source, or (c) no description | **Assessment of exposure (norms)*****One star*** if assessed using standardised or validated (a) self-report measures, or (b) interview schedule with blind assessor. ***No star*** if (c) assessed using a non-standardised or validated self-report questionnaire or interview schedule, or (d) no description | **Ascertainment of outcome (smoking)*****One star*** if (a) bio-verified. ***No star*** if (b) verified only by self-report, or (c)no description | **Adequacy of follow up of cohorts*****One star*** if (a) complete follow up, or (b) subjects lost to follow up unlikely to introduce bias (>70% follow up) or description provided of those lost. ***No star*** if (c) follow up <70% and no description of those lost, or (d) no statement |
| **INCLUDED IN NARRATIVE REVIEW AND META-ANALYSIS** |
| [53] 3\* | \* | \* |  |  | \* |
| [54] 4\* | \* | \* | \* |  | \* |
| [55] 3\* | \* | \* | \* |  |  |
| [56] 3\* | \* | \* |  |  | \* |
| [57] 4\* | \* | \* |  | \* | \* |
| [58] 5\* | \* | \* | \* | \* | \* |
| [59] 5\* | \* | \* | \* | \* | \* |
| [60] 3\* | \* | \* |  |  | \* |
| [61] 2\* | \* | \* |  |  |  |
| [62] 4\* | \* | \* | \* |  | \* |
| [63] 5\* | \* | \* | \* | \* | \* |
| [64] 3\* | \* | \* | \* |  |  |
| [65] 2\* | \* | \* |  |  |  |
| [66] 3\* | \* | \* |  |  | \* |
| [67] 2\* |  | \* |  |  | \* |
| [68] 2\* |  | \* |  |  | \* |
| [69] 3\* | \* | \* |  |  | \* |
| **INCLUDED IN NARRATIVE REVIEW ONLY** |
| [70] 4\* | \* | \* | \* |  | \* |
| [71] 2\* |  | \* |  |  | \* |
| [72] 2\* |  | \* |  |  | \* |
| [73] 3\* |  | \* | \* |  | \* |
| [74] 3\* | \* | \* |  |  | \* |
| [75] 3\* | \* | \* | \* |  |  |
| [76] 3\* | \* | \* |  |  | \* |
| [77] 3\* | \* | \* |  |  | \* |
| [79] 3\* | \* | \* | \* |  |  |
| [78] 4\* | \* | \* | \* |  | \* |
| [80] 3\* | \* | \* |  |  | \* |
| [81] 4\* | \* | \* | \* |  | \* |
| [82] 4\* | \* | \* | \* |  | \* |

Table S5. Associations between descriptive norms and smoking initiation and escalation. Abbreviations are defined in footnote.

| **Ref** | **Association between norm and smoking as presented in article** | **Analysis (variables adjusted for)** | **Follow-up (months)** | **N** |
| --- | --- | --- | --- | --- |
| **PARENT SMOKING** |
| ***Initiation of smoking*** |
| [62] | ✓+ | Having at least one parent who increased the odds of initiating any smoking in unadjusted (OR=2.99 [1.72-5.20]) and adjusted (2.97 [1.62-5.44]) analyses. | LogR (A, AP, N, EC, ECN, G, ITS, PB, N (DN friend, DN sibling, IN public)) | 6 | 923 |
| [75] | ✓+ | Having at least one parent who smokes increased the risk of initiating any smoking (coef=.41, p<.05). | SEM (ITS, PS, TPB, N (IN friend)) | 6 | 1070 |
| [64] | ✓+ | Parent smoking increased the odds of at-least-monthly smoking initiation among girls (OR=1.54 [1.10-2.16]) and boys (2.60 [1.76-3.83]). | LogR (A, ITS, L, PB, R, SES, TPB, N (DN friend, IN parent, IN friend, pressure parents, pressure friends)) | 12 | 4055 |
| [66] | ✓+ | Parent smoking was positively directly associated with initiating any smoking (β=0.07, p<.001). | SEM (A, ED, G) | 24 | 4351 |
| [60] | ✓+ | Those with at least one parent who smokes had greater risk of initiating any smoking (RR=2.25 [1.77–2.86]). | LogR (A, G, school) | 26 | 2603 |
| [56] | ✓+/🗶 | Mothers’ smoking increased the odds of initiating any smoking in unadjusted (OR=1.8 [1.2-2.9]) and adjusted (1.5 [0.9-2.5]) analyses. Fathers’ smoking increased the odds of initiating any smoking in unadjusted (1.8 [1.1-2.8]) but not adjusted (1.6 [0.9-2.7]) analyses. | LogR (FS, LS, R, TPB, N (DN friend, IN grouped, friend pressure)) | 18 | 442 |
| [57] | 🗶 | Little evidence of an association between parent smoking and initiation of past-year smoking among baseline past-year never smokers in unadjusted analyses (OR=1.14 [0.84-1.53]). Parent smoking was not assessed in adjusted models. | LogR | 24 | 1654 |
| [61] | / | Not reported | Not reported |  |  |
| [69] | / | Not reported | Not reported |  |  |
| ***Escalation of smoking*** |
| [78] | ✓+ | Having at least one parent who smokes increased the odds of being an at-least-monthly smoker (OR=1.62 [1.38-1.91]). | LogR (A, BS, ED, G, N (DN friend) | 14 | 6769 |
| [54] | ✓+ | Compared with the non-smoking trajectory, having a parent who smoked increased the odds of being in all five other trajectories (trier: OR=2.40 [1.93-2.98]; occasional user: 3.06 [2.34-4.01]; early onset: 4.37 [3.20-5.97]; late onset: 2.22 [1.64-3.01]; decliner: 8.39 [5.09-13.81]). There was a significant association between parent smoking and trajectory group (X2=199.14, p<.05). | LogR (A, E, FS, L, HSR, TIP, TPB, N (DN friend, DN peer, DN adult)) | 36 | 3637 |
| [82] | ✓+/🗶 | Having parents who smoke increased the odds of being a stable light/occasional (vs. non-smoker: OR=1.52 [1.28–1.81]) but not an accelerating (vs. non-smoker: 1.59 [0.88–2.86]; vs. stable light/occasional smoker: 1.04 [0.58–1.88]) smoker. | GCM (AP, FS, G, L, MH, PB, PS, school, SES, TPB, N (DN peer, IN parent, IN friend, IN teachers)) | 96 | 3521 |
| *Table S5 continued below.* |

| Table S5 (continued). Associations between descriptive norms and smoking initiation and escalation. Abbreviations are defined in footnote. |
| --- |
| **Ref** | **Association between norm and smoking as presented in article** | **Analysis (variables adjusted for)** | **Follow-up (months)** | **N** |
| [58] | ✓+/🗶 | There was little evidence of an association between having a parent who smokes and smoking escalation from being a never smoker or less-than-monthly smoker at baseline in either analysis 1 (OR=1.02, p>.05) or 2 (OR=1.11, p>.05). However, there were parent smoking\*discussion (χ2(1,380)=8.62, p<.003) and parent smoking\*punishment (χ2(1,380)=6.09, p<.02) interactions: when both parents did not smoke, discussing smoking decreased the odds of smoking escalation (OR=0.41, p=.004), but when at least one parent smoked there was little evidence of an association between discussion and smoking escalation (OR=.98, p=.940). For smoking punishment, there were no effects in either subgroup (nonsmoking parents: OR=0.79, p=.384; smoking parent: OR=1.39, p=.212). | LogR (analysis 1: A, BS, FS, SES, N (IN parent discussion); analysis 2: A, BS, FS, SES, N (IN parent punishment)) | 24 | 382 |
| [72] | 🗶 | Father (M=-.01, SD=.01, p>.05) and mother (M=.01, SD=.01, p>.05) smoking were not associated change in cigarettes smoked per day among those who had ever tried smoking. | GCM (BS, G, relationship status, N (DN friend, DN partner, IN partner, IN friend)) | 9 | 779 |
| [76] | 🗶 | There was little evidence of an association between mother or father smoking and initiation of at-least-weekly smoking from less-than-weekly smokers at baseline in unadjusted (both p>.05; statistics not reported) or adjusted (statistics not reported) analyses. | Correlation and LogR (AP, FS, G, ITS, PB, SES, TPB, N (DN sibling, DN friend, DN peer, IN parent, IN sibling, IN friend, pressure parents, pressure siblings, pressure friends)) | 9 | 504 |
| [61] | / | Not reported | Not reported |  |  |
| **SIBLING SMOKING** |
| ***Initiation of smoking*** |
| [60] | ✓+ | Having a sibling who smokes increased the risk of initiating any smoking (RR=1.91 [1.42–2.59]). | GLM (A, G, school) | 26 | 2603 |
| [62] | ✓+/🗶 | Sibling smoking was associated with increased odds of initiating any smoking in unadjusted (OR=2.83 [1.23-6.51]) but not adjusted (0.75 [0.30-1.84]) analyses. | LogR (A, AP, EC, ECN, G, ITS, PB, N (DN parent, DN friend, IN public)) | 6 | 923 |
| ***Escalation of smoking*** |
| [76] | ✓+/🗶 | Brother (r=.09, p<.05) but not sister (p>.05; statistics not reported) smoking was positively associated with initiation of at-least-weekly smoking from baseline less-than-weekly smoking in unadjusted correlation analyses, but neither were associated with smoking in adjusted regression analyses (statistics not reported). | Correlation and LogR (AP, FS, G, ITS, PB, SES, TPB, N (DN parent, DN friend, DN peer, IN parent, IN sibling, IN friend, pressure parents, pressure siblings, pressure friends)) | 9 | 504 |
| **FAMILY/HOUSEHOLD SMOKING** |
| ***Initiation of smoking*** |
| [67] | ✓+/🗶 | Having more household/family members who smoke increased the odds of initiating smoking from baseline never smoking or only puffing on a cigarette in unadjusted (p<.001; statistics not reported) but not adjusted (p>.05; statistics not reported) analyses. | LogR (A, FS, G, ITS, L, language, MH, SX, SES, N (DN friend, DN adult)) | 60 | 973 |
| [59] | ✓+/🗶 | Having two (OR=2.05 [1.37-3.06]) or at least three (1.90 [1.23-2.94]) family members who smoke, but not one (0.76 [0.51-1.13]), vs. none, increased the odds of initiating any smoking. | LogR (EC, G, ITS, SES, TBP, N (DN friend, IN general)) | 12 | 1726 |
| [55] | ✓+/🗶 | Having someone at home who smokes was positively associated with initiating any smoking in unadjusted (X2= 4.32, p=.038) but not adjusted (OR=0.83 [0.65-1.06]) analyses. | X2 and LogR (A, G, E, L, SE, TPB, N (DN friend)) | 36 | 2034 |
| *Table S5 continued below.* |
| [53] | 🗶 | Having someone at home who smokes was not associated with initiating any smoking (OR=1.04 [0.52–2.06]). | LogR (AP, E, G, SES) | 16 | 298 |
| [61] | / | Not reported | Not reported |  |  |
| ***Escalation of smoking*** |
| [59] | ✓+ | Having one (OR=1.69 [0.61-4.68]) two (1.41 [0.48-4.12]), or at least three (1.23 [0.45-3.41]) family members who smoke (vs. none) increased the odds of initiating rarely, occasional, or frequent smoking among baseline ever smokers. | LogR (EC, G, ITS, SES, TBP, N (DN friend, IN general)) | 12 | 318 |
| [71] | 🗶 | Number of smoking family members was not associated with trajectories (X2(12)=9.34, p>0.65). | X2 | 8 | 193 |
| [61] | / | Not reported | Not reported |  |  |
| **CLOSE FRIEND SMOKING** |
| ***Initiation of smoking*** |
| [53] | ✓+ | Having at least one friend who smokes increased the odds of initiating any smoking (OR=2.58 [1.30–5.09]). | LogR (AP, E, G, SES) | 16 | 298 |
| [55] | ✓+ | Having more close friends who smoke was positively associated with initiating any smoking in unadjusted (t=4.02, p<.001) and adjusted (OR=1.20 [1.08-1.33]) analyses. | T-test and LogR (A, E, G, L, SE, TPB, N (DN Household/ Family)) | 36 | 2034 |
| [59] | ✓+ | Compared with having no friends who smoke, youth with a few (OR=1.87 [1.35-2.58]) or most (2.99 [1.52-5.87]) friends who smoke had greater odds of initiating any smoking. | LogR (EC, G, ITS, SES, TBP, N (DN family, IN general)) | 12 | 1726 |
| [60] | ✓+ | Those with any friends who smoke had greater risk of initiating any smoking (RR=1.87 [1.46–2.41]). | LogR (A, G, school) | 26 | 2603 |
| [62] | ✓+ | Having friends who smoke increased the odds of initiating any smoking in unadjusted (OR=2.60 [1.34-5.07]) and adjusted (1.48 [0.66-3.34]) analyses. | LogR (A, AP, EC, ECN, G, ITS, PB, N (DN parent, DN sibling, IN public)) | 6 | 923 |
| [67] | ✓+ | Having at least a few friends who smoke increased the odds of initiating smoking from baseline never smoking or only puffing on a cigarette in unadjusted (p<.001; statistics not reported) and adjusted (OR=1.73 [1.12-2.70]) analyses. | LogR (A, FS, G, ITS, L, language, MH, SX, SES, N (DN Household/Family, DN adult)) | 60 | 973 |
| [57] | ✓+/🗶 | Having a best friend who smokes increased the odds of initiating past-year any smoking in unadjusted (OR=5.86 [4.07-8.44]) but not adjusted (1.56 [0.91-2.68]) analyses. However, increases in best friend smoking between survey waves increased the odds of past-year any smoking (1.80 [1.13-2.88]). | LogR (PB, peer offers cigarettes, TPB, N (DN peer)) | 24 | 1654 |
| [61] | ✓+/🗶 | Main effect of friend smoking not assessed. However, there was an interaction between peer smoking and perceived accessibility: compared to those with neither perceived accessibility nor friends who smoke, those with at least one smoking friend but no perceived accessibility (unadjusted: HR=5.60 [3.76-8.36]; adjusted: 4.04 [2.66-6.15]) and those with at least one smoking friend and perceived accessibility (unadjusted: 6.82 [4.53-10.29]; adjusted: 3.65 [2.26-5.9]) were more likely to initiate any smoking. | Survival analyses (A, concerns about weight, G, LS, PB, PS, N (DN parent, IN parent)) | 48 | 1027 |
| [56] | 🗶 | Best friends’ smoking was not associated with initiating any smoking in unadjusted (OR=2.2 [0.7-6.1]) or adjusted (0.7 [0.2-2.8]) analyses. | LogR (FS, LS, R, TPB, N (DN parent, IN grouped, friend pressure)) | 18 | 442 |
| [68] | 🗶 | Neither number (model 1: OR=1.06 [0.90-1.25]; model 2: OR=0.99 [0.88-1.12]) nor proportion (model 1: 1.43 [0.69-2.95]; model 2: 1.00 [0.59-1.71]) of smoking friends was associated with initiating any smoking. | LogR (A, AP, BS [model 2 only], friendships, E, G, L, SES, N (DN peer, IN friends)) | 12 | 1950 |
| *Table S5 continued below.* |
| [64] | 🗶 | Having at least half of friends who smoke was not associated with at-least-monthly smoking initiation among girls (p>.05; statistics not reported) or boys (OR=1.90 [0.97-3.73]). | LogR (A, ITS, L, PB, R, SES, TPB, N (DN parent, IN parent, IN friend, pressure parents, pressure friends)) | 12 | 4055 |
| ***Escalation of smoking*** |
| [73] | ✓- | Perceiving that a higher percentage of close friends smoke was negatively associated with escalation in number of cigarettes smoked per week (estimate=-0.01, SE=0.00, p=.001). | GCM (A, BS, E, G, MH, N (DN peer)) | 9 | 449 |
| [77] | ✓+ | Having close friends who smoke seldom/sometimes (OR=1.85 [1.37-2.50]) or often/always (2.72 [1.72-4.31]) (vs. never) increased the odds of having higher levels of past-month smoking. | Ordinal LogR (BS, E, FS, G, MH, PB, PS, school, SES, N (IN parent)) | 48 | 2659 |
| [78] | ✓+ | Having a best friend who smokes (OR=2.35 [1.91-2.90]) and having over half of friends who smoke increased the odds of being an at-least-monthly smoker (OR=2.93 [2.32-3.69]). | LogR (A, BS, ED, G, N (DN parent)) | 14 | 6769 |
| [54] | ✓+ | Compared with the non-smoking trajectory, having more friends who smoke increased the odds of being in all five other trajectories (trier: OR=1.68 [1.51-1.86]; occasional user: 2.66 [2.38-2.98]; early onset: 3.46 [3.06-3.92]; late onset: 2.13 [1.88-2.41]; decliner: 5.91 [4.96-7.05]). There was a significant association between friend smoking and trajectory group (X2=604.02, p<.05). | LogR (A, E, FS, L, HSR, TIP, TPB, N (DN parent, DN peer, DN adult)) | 36 | 3637 |
| [71] | ✓+/🗶 | Spending time with people who smoke a lot (F(48,728)=1.01, p<0.45) and number of close high school friends who smoke (F(6,186)=1.39, p>0.20) were not associated with smoking trajectories, but frequency of being around friends while they smoke was (X2(12)=23.11, p<0.03): a smaller proportion of small increasers and sporadic smokers reported that they were around friends while they were smoking ‘a lot’ compared to the remaining classes. | ANOVA and X2 | 8 | 193 |
| [59] | ✓+/🗶 | Compared with having no friends who smoke, those with most (OR=3.23 [1.19-8.77]) but not a few (1.15 [0.50-2.66]) friends who smoke had greater odds of initiating rarely, occasional, or frequent smoking among baseline ever smokers. | LogR (EC, G, ITS, SES, TBP, N (DN family, IN general)) | 12 | 318 |
| [72] | ✓+/🗶 | As current friend smoking increased, smoking increased (M=.02, SD=.004, p<.001), but there was little evidence of an association between high school friend smoking and smoking (M=.0003, SD=.004, p>.05) among those who had ever tried smoking. | GCM (BS, G, relationship status, N (DN parent, DN partner, IN partner, IN friend)) | 9 | 779 |
| [74] | ✓+/🗶 | Having more close friends who smoke was positively associated with change in past-month smoking (ß=.10, p=.005), but when splitting results by gender this was only true in males (B=.17, p<.001) not females (B=-.01, p=.910). | MGLM (A, AP, BS, G, ITS, L, MH, PB, PS, SES, TPB, N (DN peer)) | 12 | 11583 |
| [76] | ✓+/🗶 | Having more friends who smoke (r=0.11, p<.05) and a best friend who smokes (r=0.22, p<.05) were positively correlated with initiation of at-least-weekly smoking from baseline less-than-weekly smoking in unadjusted correlation analyses, but neither were associated in adjusted regression analyses (statistics not reported). | Correlation and LogR (AP, FS, G, ITS, PB, SES, TPB, N (DN parent, DN sibling, DN peer, IN parent, IN sibling, IN friend, pressure parents, pressure siblings, pressure friends) | 9 | 504 |
| *Table S5 continued below.* |
| [61] | ✓+/🗶 | Main effect of friend smoking not assessed. However, there was peer smoking\*perceived accessibility interaction: compared to those with neither perceived accessibility nor smoking friends, those with at least one smoking friend but no perceived accessibility (unadjusted: HR= 9.53 [4.92-18.47]; adjusted: 4.85 [2.35-10.02]) and those with at least one smoking friend and perceived accessibility (unadjusted: 27.63 [15.61-48.91]; adjusted: 8.27 [4.23-16.19) had greater odds of progressing from never or less-than-weekly smoking to at-least-weekly smoking. | Survival analyses (A, G, PB, PS, RTA, N (DN parent, IN parent)) | 48 | 1195 |
| **ROMANTIC PARTNER SMOKING** |
| ***Escalation of smoking*** |
| [72] | ✓+ | As romantic partner smoking increased, number of cigarettes smoked per day increased among those who had ever tried smoking (M=.01, SD=.01, p<.01). | GCM (BS, G, relationship status, N (DN parent, DN friend, IN partner, IN friend)) | 9 | 779 |
| **PERCEIVED PREVALENCE OF PEER SMOKING** |
| ***Initiation of smoking*** |
| [69] | ✓+ | Overestimating peer prevalence of smoking increased the odds of initiating any smoking in unadjusted (OR=2.04 [1.31–3.17]) and adjusted (1.79 [1.03–3.13]) analyses. | LogR (A, G, L, school, SHS, N (DN parent) | 24 | 2171 |
| [57] | ✓+/🗶 | Perceiving a greater proportion of smoking peers increased the odds of initiating past-year any smoking in unadjusted (OR=5.99 [4.33-8.31]) but not adjusted (OR=1.66, CI=0.96-2.84) analyses. However, increases in perceiving a greater proportion of smoking peers between survey waves increased the odds of past-year any smoking (1.72 [1.16-2.57]). | LogR (PB, peer offers cigarettes, TPB, N (DN friend) | 24 | 1654 |
| [55] | 🗶 | Perceived prevalence of peer smoking was not associated with initiating any smoking in unadjusted (X2=2.10, p=.349) or adjusted (statistics not reported) analyses. | X2 and LogR (not stated) | 36 | 2034 |
| [68] | 🗶 | Perceived prevalence of smoking among students the same age was not associated with initiating any smoking from baseline never smoking (model 1: OR=0.99 [0.92-1.05]) or any smoking among all smokers while controlling for baseline never vs. any smoking (model 2: OR=0.99 [0.94-1.04]). | LogR (A, AP, BS [model 2 only], friendships, E, G, L, SES, N (DN friend, IN friend) | 12 | 1950 |
| ***Escalation of smoking*** |
| [73] | ✓+ | Perceiving that a higher percentage of university students smoke was positively associated with escalation in number of cigarettes smoked per week (estimate=0.003, SE=0.00, p=.041). | GCM (A, BS, E, G, MH, N (DN friend) | 9 | 449 |
| [78] | ✓+ | Overestimating lifetime smoking among adolescents the same age increased the odds of being an at-least-monthly smoker (OR=1.43 [1.19-1.72]). | LogR (A, G, ED, BS) | 14 | 6769 |
| [54] | ✓+ | Compared with the non-smoking trajectory, perceptions that a higher number of teenagers of the same age smoke increased the odds of being in all five other trajectories (trier: OR=1.32 [1.18-1.48], occasional user: 1.93 [1.68-2.22], early onset: 2.11 [1.81, 2.47]; late onset: 1.58 [1.35-1.85]; decliner: 3.01 [2.43-3.72]). There was a significant association between perceived peer smoking and trajectory group (X2=211.88, p<.05). | LogR (A, E, FS, L, HSR, TIP, TPB, N (DN parent, DN friend, DN adult)) | 36 | 3637 |
| *Table S5 continued below.* |
| [82] | ✓+ | Perceiving a higher percentage of smoking peers increased the odds of being a stable light/occasional (vs. non-smoker: OR=1.39 [1.2–1.6]) and accelerating (vs. non-smoker: 5.00 [2.96–8.44]; vs. stable light/occasional smoker: 3.6 [2.14–6.06]) smoker. | GCM (AP, FS, G, L, MH, PB, PS, school, SES, TPB, N (DN parent, IN parent, IN friend, IN teachers)) | 96 | 3521 |
| [74] | ✓+/🗶 | Perceiving that more students your age smoke was positively associated with change in past-month smoking (ß=.11, p=.010) but when splitting results by gender this was not true in males (B=.09, p=.085) or females (B=.13, p=.059). | MGLM (A, AP, BS, G, ITS, L, MH, PB, PS, SES, TPB, N (DN friend)) | 12 | 11583 |
| [76] | ✓+/🗶 | Perceiving that more people in the same school year smoke was positively correlated with initiation of at-least-weekly smoking from baseline less-than-weekly smoking in unadjusted correlation analyses (r=0.10, p<.05), but not adjusted regression analyses (statistics not reported). | Correlation and LogR (AP, FS, G, ITS, PB, SES, TPB, N (DN parent, DN sibling, DN friend, IN parent, IN sibling, IN friend, pressure parents, pressure siblings, pressure friends)) | 9 | 504 |
| [71] | 🗶 | Perceived prevalence of smoking among students was not associated with smoking trajectories (F(48,760)=1.06, p< 0.36). | ANOVA | 8 | 193 |
| **PERCEIVED PREVALENCE OF ADULT SMOKING** |
| ***Initiation of smoking*** |
| [67] | ✓+ | Perceiving that at least a few of your parents’ friends smoke increased the odds of initiating smoking from baseline never smoking or only puffing on a cigarette in unadjusted (p<.001; statistics not reported) and adjusted (OR=1.38 [1.02-1.88]) analyses. | LogR (A, FS, G, ITS, L, language, MH, SX, SES, N (DN Household/Family, DN friend)) | 60 | 973 |
| [55] | 🗶 | Perceived prevalence of adult smoking was not associated with initiating any smoking in unadjusted (X2=1.56, p=.459) or adjusted (statistics not reported) analyses. | X2 and LogR (not stated) | 36 | 2034 |
| ***Escalation of smoking*** |
| [54] | ✓+ | Compared with the non-smoking trajectory, perceptions that a higher number of adults smoke was increased the odds of being in all five other trajectories (trier: OR=1.36 [1.19-1.55]; occasional user: 1.70 [1.44-2.00]; early onset: 1.95 [1.62-2.34]; late onset: 1.33 [1.11-1.60]; decliner: 2.02 [1.58-2.59]). There was a significant association between perceived adult smoking and trajectory group (X2= 96.24, p<.05). | LogR (A, E, FS, L, HSR, TIP, TPB, N (DN parent, DN friend, DN peer)) | 36 | 3637 |

*Associations:* ✓ = Some evidence of associations (p<.05, or 95% CI excludes the null). ✓/🗶 = Mixed evidence of associations (some p<.05, or 95% CI excludes the null, some p≥.05, or 95% CI includes the null). 🗶 = Little evidence of associations (p≥.05, or 95% CI includes the null). / = unclassifiable (associations not reported.

✓+ = Positive association (where there is some or mixed evidence only). - = Negative association (where there is some or mixed evidence only). OR=Odds Ratio. [ ] = 95% confidence intervals. *Analysis:* ANOVA=Analysis of Variance, GCM=Growth Curve Models, LogR=Logistic Regression (or similar form, e.g. general linear model with log link), LinR=Linear Regression, MGLM=Multilevel Generalised Linear Model, SEM=Structural Equation Modelling, X2=Chi Squared. *Covariates*: A=Age, AP=Academic Performance, BS=Baseline Smoking, E=Ethnicity, EC=Vaping, ECN=Vaping norms, FS=Family Structure/relationships, G=Gender, HSR=Home Smoking Restrictions, ITS=Intention/susceptibility To Smoke, L=Location, LS=Liking School/positive school experiences, MH=Mental Health, MSE=Movie Smoking Exposure, N=smoking Norms (DN=Descriptive Norm, IN=Injunctive Norm), PB=Problem Behaviour (includes alcohol/drug use, sensation-seeking, rebelliousness), PS=Parenting Style, R=Religion/culture, RTA=Receptivity to Tobacco Advertising, SE=Self-Esteem, SX=Smoking expectancies, SES=Socio-Economic Status, SHS=exposure to Second-Hand Smoke, TIP=Tobacco Industry Perceptions, TPB=Theory of Planned Behaviour measures (attitude, self-efficacy, perceived behavioural control, anticipated regret).

Table S6. Associations between injunctive norms and smoking initiation and escalation. Abbreviations are defined in footnote.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Ref** | **Association between norm and smoking as presented in article** | **Analysis (variables adjusted for)** | **Follow-up (months)** | **N** |
| **PARENT APPROVAL OF SMOKING** |
| ***Initiation of smoking*** |
| [60] | ✓+ | Those with neither/one parent (vs. both) who disapprove of smoking had greater risk of initiating any smoking (RR= 1.53 [1.16–2.01]). | LogR (A, G, school) | 26 | 2603 |
| [57] | ✓+/🗶 | Perceiving less disapproval from parents increased the odds of initiating past-year any smoking among baseline past-year never smokers in unadjusted (OR=0.21 [0.15-0.30]) but not adjusted (statistics not reported) analyses. | LogR (not stated) | 24 | 1654 |
| [64] | ✓+/🗶 | Perceiving that parents think you should not smoke decreased the odds of at-least-monthly smoking initiation among boys (OR=0.77 [0.62-0.96]) but not girls (p>.05; statistics not reported). However, social norm from parents only became a significant predictor for boys when both parent smoking and intention to smoke were included in the model. | LogR (A, ITS, L, PB, R, SES, TPB, N (DN parent, DN friend, IN friend, pressure parents, pressure friends)) | 12 | 4055 |
| [66] | ✓+/🗶 | Parent disapproval was negatively associated with initiating any smoking (β=-0.18, p<.001) but when splitting by parent smoking this was only true among those with non-smoking parents (β=-0.17, p<0.001) and those with one smoking parent (β=-0.22, p<0.001) but not those with two smoking parents (statistics not reported). | SEM (A, ED, G, PS, N (DN parent)) | 24 | 4351 |
| [55] | 🗶 | Perceiving that smoking would bother parents a lot was not associated with initiating any smoking in either unadjusted (X2=3.75, p=.053) but not adjusted (statistics not reported) analyses. | X2 and LogR (not stated) | 36 | 2034 |
| [70] | 🗶 | Perceiving more favourable norms towards smoking from parents was not associated with initiating any smoking in unadjusted (OR=0.89, p>.05) or adjusted (OR=1.11, p>.05) analyses. | LogR (A, AP, E, G, ITS, LS, MH, PS, SX, SES, TPB, N (IN peer)) | 10 | 1137 |
| [61] | / | Not reported | Not reported |  |  |
| ***Escalation of smoking*** |
| [77] | ✓+ | Perceiving that parents think it’s important you don’t smoke was negatively associated with higher levels of past-month smoking (OR=0.90 [0.85-0.94]). | Ordinal LogR (BS, E, FS, G, MH, PB, PS, school, SES, N (DN friend)) | 48 | 2659 |
| [76] | ✓+/🗶 | Perceiving more approval of smoking from parents was positively correlated with initiation of at-least-weekly smoking from baseline less-than-weekly smoking in unadjusted correlation analyses (r=0.14, p<.05), but not adjusted regression analyses (statistics not reported). | Correlation and LogR (AP, FS, G, ITS, PB, SES, TPB, N (DN parent, DN sibling, DN friend, DN peer, IN sibling, IN friend, pressure parents, pressure siblings, pressure friends)) | 9 | 504 |
| [58] | ✓+/🗶 | There was little evidence of an association between parent discussion (OR=0.75, p>.05) or punishment (OR=1.12, p>.05) and smoking escalation from being a never smoker or less-than-monthly smoker at baseline. However, there were parent smoking\*discussion (χ2(1,380)=8.62, p<.003) and parent smoking\*punishment (χ2(1,380)=6.09, p<.02) interactions: when both parents did not smoke, discussing smoking decreased the odds of smoking escalation (OR=0.41, p=.004), but when at least one parent smoked there was little evidence of an association between discussion and smoking escalation (OR=.98, p=.940). For smoking punishment, there were no effects in either subgroup (nonsmoking parents: OR=.79, p=.384; smoking parent: OR=1.39, p=.212). | LogR (analysis 1: A, BS, FS, SES, N (DN parent)) | 24 | 382 |
| *Table S6 continued below.* |
| Table S6 (continued). Associations between injunctive norms and smoking initiation and escalation. Abbreviations are defined in footnote. |
| **Ref** | **Association between norm and smoking as presented in article** | **Analysis (variables adjusted for)** | **Follow-up (months)** | **N** |
| [82] | ✓+/🗶 | Perceiving that parents would react badly if you smoked reduced the odds of being a stable light/occasional (vs. non-smoker: OR=0.57 [0.33–0.99]) but not an accelerating (vs. non-smoker: 0.44 [0.12–1.54]); vs. stable light/occasional: 0.77 [0.23–2.59]) smoker. Perceiving that parents agree with smoking increased the odds of being a stable light/occasional (vs. non-smoker: 0.66 [0.5–0.88]) and accelerating (vs. non-smoker: 0.29 [0.16–0.52]; vs. stable light/occasional: 0.43 [0.24–0.77]) smoker. | GCM (AP, FS, G, L, MH, PB, PS, school, SES, TPB, N (DN parent, DN peer, IN friend, IN teachers)) | 96 | 3521 |
| [79] | 🗶 | Parent approval of smoking was not associated with intention to smoke for either older (mother model: β=-.10, father model: β=-.16, both p>.05) or younger (mother: β=.18, father: β=.21, both p>.05) siblings (intention to smoke did subsequently predict higher smoking stage for older (mother: β=0.40, father: β=0.38, both p<.05) and younger (mother: β=0.32, father: β=0.35, both p<.05) siblings. | SEM (parent self-report smoking, parent communication about smoking, TPB, N (IN friend)) | 12 | 314 |
| [61] | / | Not reported | Not reported |  |  |
| **SIBLING APPROVAL OF SMOKING** |
| ***Escalation of smoking*** |
| [76] | ✓+/🗶 | Perceiving more approval of smoking from siblings was positively correlated with initiation of at-least-weekly smoking from baseline less-than-weekly smoking in unadjusted correlation analyses (r=0.12, p<.05), but not adjusted regression analyses (statistics not reported). | Correlation and LogR (AP, FS, G, ITS, PB, SES, TPB, N (DN parent, DN sibling, DN friend, DN peer, IN parent, IN friend, pressure parents, pressure siblings, pressure friends)) | 9 | 504 |
| **CLOSE FRIEND/PEER APPROVAL OF SMOKING** |
| ***Initiation of smoking*** |
| [70] | ✓+/🗶 | Perceiving more favourable norms towards smoking from best friends and classmates increased the odds of initiating any smoking in unadjusted (OR=0.83, p<.001) but not adjusted (OR=0.89, p>.05) analyses. | LogR (A, AP, E, G, ITS, LS, MH, PS, SX, SES, TPB, N (IN parent)) | 10 | 1137 |
| [57] | ✓+/🗶 | Perceiving less disapproval from friends increased the odds of initiating past-year any smoking among baseline past-year never smokers in unadjusted (OR=0.15 [0.11-0.22]) but not adjusted (statistics not reported) analyses. | LogR (not stated) | 24 | 1654 |
| [75] | ✓+/🗶 | Perceiving that friends approve of smoking was associated with initiating any smoking via intention to smoke (norm-intention path: coef=.21, p<.05; intention-smoking: coef=.21, p<.05), but was not directly associated with initiating any smoking (p>.05; statistics not reported). | SEM (ITS, PS, TPB, N (DN parent)) | 6 | 1070 |
| [53] | 🗶 | Having friends who are friendly towards smoking was not associated with initiating any smoking (OR=1.15 [0.63–2.10]). | LogR (AP, E, G, SES) | 16 | 298 |
| [64] | 🗶 | Perceiving that friends think you should smoke was not associated with at-least-monthly smoking initiation among girls or boys (both p>.05; statistics not reported). | LogR (A, ITS, L, PB, R, SES, TPB, N (DN parent, IN parent, DN friend, pressure parents, pressure friends)) | 12 | 4055 |
| [61] | / | Not reported | Not reported |  |  |
| ***Escalation of smoking*** |
| [72] | ✓+ | As perceived approval of smoking from the three people you spend the most time with other than partner increased, number of cigarettes smoked per day increased (M=.01, SD=.003, p<.001) among those who had ever tried smoking. | GCM (BS, G, relationship status, N (DN parent, DN friend, DN partner, IN partner)) | 9 | 779 |
| *Table S6 continued below.* |
| Table S6 (continued). Associations between injunctive norms and smoking initiation and escalation. Abbreviations are defined in footnote. |
| **Ref** | **Association between norm and smoking as presented in article** | **Analysis (variables adjusted for)** | **Follow-up (months)** | **N** |
| [82] | ✓+ | Perceiving that friends would act badly if you smoked reduced the odds of being a stable light/occasional (vs. non-smoker: OR=0.59 [0.45-0.76]) and accelerating (vs. non-smoker: 0.28 [0.16–0.48]; vs. stable light/occasional: 0.47 [0.28–0.8]) smoker. | GCM (AP, FS, G, L, MH, PB, PS, school, SES, TPB, N (DN parent, DN friend, IN parent, IN teachers)) | 96 | 3521 |
| [71] | ✓+ | There was an association between perceived approval of smoking from the three people you spend the most time with other than partner and smoking trajectories (F(48,728)=1.59, p< 0.01). Perceived approval of smoking was higher among those with the highest levels of smoking at the beginning of the study (early decreasers) and there was a decline in perceived approval for most classes except large increasers and small increasers, who both showed an increase in smoking that was associated with an increase in close friend approval of smoking. | ANOVA | 8 | 193 |
| [79] | ✓+/🗶 | Friends approval of smoking was positively associated with smoking stage via intention to smoke for older (norm-intention path: mother model: β=.47, father model: β=.51, both p<.05; intention-smoking: mother: β=0.40, father: β=0.38, both p<.05) but not younger (norm-intention: mother: β=.16, father: β=.14, both p>.05; intention-smoking: mother: β=0.32, father: β=0.35, both p<.05) siblings. | SEM (parent self-report smoking, parent communication about smoking, TPB, N (IN parent)) | 12 | 314 |
| [76] | ✓+/🗶 | Perceiving more approval of smoking from friends/best friend/people in the same school year was positively correlated with initiation of at-least-weekly smoking from baseline less-than-weekly smoking in unadjusted correlation analyses (r=0.10, p<.05), but not adjusted regression analyses (statistics not reported). | Correlation and LogR (AP, FS, G, ITS, PB, SES, TPB, N (DN parent, DN sibling, DN friend, DN peer, IN parent, IN sibling, pressure parents, pressure siblings, pressure friends)) | 9 | 504 |
| [80] | 🗶 | Friends/best friends approval of smoking was not associated with escalation in smoking stage (β=0.06, p>.05). | LinR (BS, TPB) | 12 | 612 |
| [81] | 🗶 | Perceiving greater approval of smoking from friends/best friends was not associated with escalation in smoking stage from being a baseline ever smoker (OR=1.23 [0.96–1.56]). | LogR (A, AP, E, G, TPB) | 12 | 397 |
| [61] | / | Not reported | Not reported |  |  |
| **PARTNER APPROVAL OF SMOKING** |
| ***Escalation of smoking*** |
| [72] | ✓+ | As perceived romantic partner approval of smoking increased, number of cigarettes smoked per day increased (M=.01, SD=.004, p<.05) among those who had ever tried smoking. | GCM (BS, G, relationship status, N (DN parent, DN friend, DN partner, IN friend) | 9 | 779 |
| **TEACHER APPROVAL OF SMOKING** |
| ***Escalation of smoking*** |
| [82] | ✓+/🗶 | Perceiving that teachers would act badly if you smoked reduced the odds of being a stable light/occasional smoker (vs. non-smoker: OR=0.45 [0.26-0.77]), but not an accelerating smoker (vs. non-smoker: 0.62 [0.14-2.77]; vs. stable light/occasional: 1.38 [0.32–5.88]) smoker. | GCM (AP, FS, G, L, MH, PB, PS, school, SES, TPB, N (DN parent, DN friend, IN parent, IN friend)) | 96 | 3521 |
| *Table S6 continued below.* |
| Table S6 (continued). Associations between injunctive norms and smoking initiation and escalation. Abbreviations are defined in footnote. |
| **Ref** | **Association between norm and smoking as presented in article** | **Analysis (variables adjusted for)** | **Follow-up (months)** | **N** |
| **APPROVAL OF SMOKING FROM IMPORTANT PEOPLE (GROUPED)** |
| ***Initiation of smoking*** |
| [63] | ✓+/🗶 | Perceiving that friends/best friend/family think you should not smoke was associated with initiation of any smoking in girls (β=0.55, SE=0.31, p<.05) but not boys (β=-0.28, SE=0.25, p>.05). | LogR (TPB) | 48 | 497 |
| [56] | 🗶 | Perceiving that teachers/friends/best friend think it’s OK to smoke was not associated with initiation of any smoking in unadjusted (OR=1.1 [0.9-1.4]) or adjusted (1.0 [0.8-1.3]) analyses. | LogR (FS, LS, R, TPB, N (DN parent, DN friend, friend pressure)) | 18 | 442 |
| [59] | 🗶 | Perceiving less acceptability of smoking from friends/best friend/family/important people was not associated with initiation of any smoking (OR=0.89 [0.57-1.39]). | LogR (EC, G, ITS, SES, TBP, N (DN family, DN friend)) | 12 | 1726 |
| ***Escalation of smoking*** |
| [65] | ✓+ | Agreeing that people important to you think you should not smoke was positively associated with escalation in smoking stage via willingness to smoke (norm-willingness path: coeff=0.14, p≤.05; willingness-smoking: coeff=0.20, p≤.05) but not via intention to smoke (norm-intention: coeff=0.41, p≤.001; intention-smoking: t=1.20; p>.05). | SEM (BS, TPB) | 12 | 760 |
| [59] | 🗶 | Perceiving less acceptability of smoking from friends/best friend/family/ important people was not associated with initiation of rarely, occasional, or frequent smoking among baseline ever smokers (OR=1.12 [0.56-2.23]). | LogR (EC, G, ITS, SES, TBP, N (DN family, DN friend)) | 12 | 318 |
| **PUBLIC APPROVAL OF SMOKING** |
| ***Initiation of smoking*** |
| [57] | ✓+/🗶 | Perceiving less disapproval from the community increased the odds of initiating past-year any smoking in unadjusted (OR=0.21 [0.15-0.31]) but not adjusted (statistics not reported) analyses. | LogR (not stated) | 24 | 1654 |
| [62] | 🗶 | Perceived public approval of smoking was not associated with initiating any smoking in unadjusted (OR=2.45 [0.60-9.96]) or adjusted (1.33 [0.34-5.16]) analyses. | LogR (A, AP, EC, ECN, G, ITS, PB, N (DN parent, DN sibling, DN friend)) | 6 | 923 |

*Associations:* ✓ = Some evidence of associations (p<.05, or 95% CI excludes the null). ✓/🗶 = Mixed evidence of associations (some p<.05, or 95% CI excludes the null, some p≥.05, or 95% CI includes the null). 🗶 = Little evidence of associations (p≥.05, or 95% CI includes the null). / = unclassifiable (associations not reported.

✓+ = Positive association (where there is some or mixed evidence only). - = Negative association (where there is some or mixed evidence only). OR=Odds Ratio. [ ] = 95% confidence intervals. *Analysis:* ANOVA=Analysis of Variance, GCM=Growth Curve Models, LogR=Logistic Regression (or similar form, e.g. general linear model with log link), LinR=Linear Regression, MGLM=Multilevel Generalised Linear Model, SEM=Structural Equation Modelling, X2=Chi Squared. *Covariates*: A=Age, AP=Academic Performance, BS=Baseline Smoking, E=Ethnicity, EC=Vaping, ECN=Vaping norms, FS=Family Structure/relationships, G=Gender, ITS=Intention/susceptibility To Smoke, L=Location, LS=Liking School/positive school experiences, MH=Mental Health, MSE=Movie Smoking Exposure, N=smoking Norms (DN=Descriptive Norm, IN=Injunctive Norm), PB=Problem Behaviour (includes alcohol/drug use, sensation-seeking, rebelliousness), PS=Parenting Style, R=Religion/culture, RTA=Receptivity to Tobacco Advertising, SE=Self-Esteem, SX=Smoking expectancies, SES=Socio-Economic Status, TPB=Theory of Planned Behaviour measures (attitude, self-efficacy, perceived behavioural control, anticipated regret).

Table S7. Associations between perceived pressure to smoke and smoking initiation and escalation. Abbreviations are defined in footnote.

| **Ref** | **Association between norm and smoking as presented in article** | **Analysis (variables adjusted for)** | **Follow-up (months)** | **N** |
| --- | --- | --- | --- | --- |
| **PRESSURE TO SMOKE FROM PARENTS** |
| ***Initiation of smoking*** |
| [64] | 🗶 | Perceiving pressure to smoke from parents was not associated with at-least-monthly smoking for either girls (OR=0.85 [0.67-1.09]) or boys (p>.05; statistics not reported). | LogR (A, ITS, L, PB, R, SES, TPB, N (DN parent, DN friend, IN parent, IN friend, pressure friends)) | 12 | 4055 |
| ***Escalation of smoking*** |
| [76] | ✓+/🗶 | Perceiving more pressure to smoke from parents was positively correlated with smoking initiation of at-least-weekly smoking from baseline less-than-weekly smoking in unadjusted correlation analyses (r=0.17, p<.05), but not adjusted regression analyses (statistics not reported). | Correlation and LogR (AP, FS, G, ITS, PB, SES, TPB, N (DN parent, DN sibling, DN friend, DN peer, IN parent, IN sibling, IN friend, pressure siblings, pressure friends)) | 9 | 504 |
| **PRESSURE TO SMOKE FROM SIBLINGS** |
| ***Escalation of smoking*** |
| [76] | ✓+/🗶 | Perceiving more pressure to smoke from siblings was positively correlated with smoking initiation of at-least-weekly smoking from baseline less-than-weekly smoking in unadjusted correlation analyses (r=0.16, p<.05), but not adjusted regression analyses (statistics not reported). | Correlation and LogR (AP, FS, G, ITS, PB, SES, TPB, N (DN parent, DN sibling, DN friend, DN peer, IN parent, IN sibling, IN friend, pressure parents, pressure friends)) | 9 | 504 |
| **PRESSURE TO SMOKE FROM FRIENDS/PEERS** |
| ***Initiation of smoking*** |
| [56] | ✓+/🗶 | Perceived pressure to smoke by friends/best friends/other adolescents increased the odds of initiating any smoking in adjusted (OR=1.8 [1.0-3.2]) but not unadjusted (1.6 [0.9-2.7]) analyses. | LogR (FS, LS, R, TPB, N (DN parent, DN friend, IN grouped)) | 18 | 442 |
| [64] | ✓+/🗶 | Perceiving pressure to smoke from friends increased the odds of at-least-monthly smoking initiation among girls (OR=1.26 [1.11-1.42]) but not boys (1.10 [0.96-1.26]). | LogR (A, ITS, L, PB, R, SES, TPB, N (DN parent, DN friend, IN parent, IN friend, pressure parents)) | 12 | 4055 |
| ***Escalation of smoking*** |
| [76] | ✓+ | Perceiving more pressure to smoke from friends/best friend/people in same school year was positively correlated with smoking initiation of at-least-weekly smoking from baseline less-than-weekly smoking in unadjusted correlation analyses (r=0.22, p<.05) and adjusted regression analyses (model 1: OR=1.86; model 2: OR=1.57, both p<.05). | Correlation and LogR (AP, FS, G, [ITS: model 2 only], PB, SES, TPB, N (DN parent, DN sibling, DN friend, DN peer, IN parent, IN sibling, IN friend, pressure parents, pressure siblings)) | 9 | 504 |

*Associations:* ✓ = Some evidence of associations (p<.05, or 95% CI excludes the null). ✓/🗶 = Mixed evidence of associations (some p<.05, or 95% CI excludes the null, some p≥.05, or 95% CI includes the null). 🗶 = Little evidence of associations (p≥.05, or 95% CI includes the null). / = unclassifiable (associations not reported.

✓+ = Positive association (where there is some or mixed evidence only). - = Negative association (where there is some or mixed evidence only). OR=Odds Ratio. [ ] = 95% confidence intervals. *Analysis:* LogR=Logistic Regression (or similar form, e.g. general linear model with log link), SEM=Structural Equation Modelling, X2=Chi Squared. *Covariates*: A=Age, AP=Academic Performance, BS=Baseline Smoking, E=Ethnicity, ITS=Intention/susceptibility To Smoke, L=Location, LS=Liking School/positive school experiences, MH=Mental Health, MSE=Movie Smoking Exposure, N=smoking Norms (DN=Descriptive Norm, IN=Injunctive Norm), PB=Problem Behaviour (includes alcohol/drug use, sensation-seeking, rebelliousness), R=Religion/culture, SES=Socio-Economic Status, TPB=Theory of Planned Behaviour measures (attitude, self-efficacy, perceived behavioural control, anticipated regret).

Figure S1. Funnel plots of the associations between (a) descriptive norms, (b) injunctive norms, and (c) perceived pressure to smoke and youth smoking initiation, by social network

a)

b)

c)

