

**Smoking prevention, peer support and social networks:  
diffusion of the ASSIST programme beyond the school setting**

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For my parents - Janis and Duncan - who I miss every, single, day.

## Abstract

**Background:** A Stop Smoking in Schools Trial (ASSIST) is a social network intervention designed to disseminate non-smoking messages among secondary school children via student selected peer supporters. Message diffusion is restricted to the school year, with limited understanding of the extent and context of message diffusion in peer supporters' wider social networks. The aim of this thesis was to address this gap by examining whether ASSIST had the potential to influence smoking behaviour, attitudes, and knowledge of smoking related harm, beyond the school year.

**Method:** Two literature reviews and a systematic review were conducted to inform the empirical data collection phase, which employed a qualitative social network design using a mixed methods analytical approach. A novel research method to collect data from young people (egocentric sociograms using coloured dots and post-it notes to prompt further discussion) and recruitment approach were piloted with 16 peer supporters from two secondary schools. Network data was quantitatively analysed using Excel and qualitative data from the interviews was analysed thematically using NVivo and Framework.

**Results:** The potential reach of message diffusion among the 16 peer supporter networks was large, with the combined number of people nominated being 151. The actual number of reported conversations was 103. Two-fifths (41%) of these conversations were with school friends and three-fifths (59%) with peer supporter family and friends outside of school. Thematic analysis of reported conversation content revealed three main types of conversation: protecting non-smokers from starting to smoke; encouraging smokers to stop; and protecting people from secondhand smoke in wider social networks. Peer supporters perceived impact with 37 people from their social networks, with examples of both positive and negative impact, focusing on the dynamics of a child speaking to an adult.

**Conclusions:** Smoking prevention message diffusion was not limited to the school year, reaching into the wider networks of peer supporters. Future interventions using the ASSIST model should consider changing the guidance that message diffusion should be limited to students in their year group only, as this may reduce the extent of message diffusion. Peer supporters should be better supported to think about whom they could

speaking to in their social network and the associated potential risks and ethical implications carefully considered.

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# Chapter 1: Introduction

## 1.1 Introduction

Tobacco use remains the leading cause of preventable death in the world. Globally it is estimated that eight million people die each year from tobacco use and another 600,000 die from second-hand smoke exposure (WHO, 2019, Oberg et al., 2011). The global number of deaths caused by tobacco exceeds that of HIV, tuberculosis and malaria combined (Wipfli, 2012). Apart from the health impact of smoking on maternal health, and the harms from second hand smoke, tobacco use is responsible for one in six deaths from non-communicable disease (NCDs) and is the only risk factor associated with the four common NCDs - cardiovascular disease, cancer, chronic lung disease and diabetes (Thakur et al., 2011).

Since the mid-1990's much has been achieved to reduce smoking prevalence in both the child and adult population through tobacco control policies, particularly in high income countries such as the UK. In Scotland, like the rest of the UK, there has been a steady decline in youth smoking; in 1996 30% of 15-year olds smoked regularly (at least once a week), by 2018 the comparable figure was 7% (Scottish Government, 2019).

Laverty et al, (2019) using the Millennium cohort study, estimated that over 220,000 of 13 and 14 year olds in the UK (24,481 in Scotland) had tried tobacco (Laverty et al., 2019). These figures suggest that large numbers of children are still experimenting with smoking, which significantly increases their likelihood of becoming a regular smoker in late adolescence, particularly for those living in deprived communities (Glenn et al., 2017, Pampel et al., 2014).

The health harms associated with tobacco increase the younger smoking uptake occurs. This is due to the association between early tobacco use and greater tobacco dependency, heavier smoking consumption, and a lower chance of stopping smoking (Leonardi-Bee et al., 2011). Children who smoke can suffer asthma, lung function and lung growth impairment and other chronic health outcomes in adulthood such as chronic obstructive lung disease, lung cancer or heart disease if they continue to smoke (Faber et al., 2017, Turner-Warwick, 1992, Muller, 2007). In addition to these health risks, existing literature highlights four further points of concern. First, the younger a person starts smoking the higher the risk that they will go on to become a regular smoker

(Breslau and Peterson, 1996b). Second, weekly smoking prevalence increases with age - the older a child gets the more they will smoke (Tyas and Pederson, 1998, Brown et al., 2014b). Third, the trend of declining rates of adolescent smoking prevalence in 11-15 year olds has not been found in 16-24 year olds, with regular smoking prevalence in Scotland increasing from 17% in 2017 to 19% in 2018 (Scottish Government 2018b, Scottish Government 2019c). Finally, smoking rates vary by socio-economic status (SES), for example in Scotland, in 2018, 9% of 15-year olds living in the most deprived areas smoked compared with 6% in the least deprived. (Scottish Government, 2019c).

Thus, adolescent smoking prevention continues to be a public health priority.

## **1.2 Smoking prevention programmes**

In addition to tobacco control policies to prevent adolescent smoking uptake there are a number of adolescent smoking prevention intervention approaches that have been evaluated via Cochrane systematic reviews. These include incentives, e.g., a prize or reward for being smoke free, (Hefler et al., 2017); family-based programmes (Thomas et al., 2007); mass media campaigns (Brinn et al., 2010); community interventions (Carson et al., 2011); and finally, school-based interventions (Thomas et al., 2013b). The latter will be considered in more depth below but results from these comprehensive reviews point to a lack of consensus around what approach works best. This is attributed to a weak evidence base as well as the complexity of understanding the context in which the interventions are delivered. In light of this, a combined approach (e.g., community and school-based interventions) is recommended, as evidenced in the 2012 US Surgeon General's report on preventing tobacco use in young adults (Benjamin, 2012):

*Coordinated, multicomponent interventions that combine mass media campaigns, price increases including those that result from tax increases, school-based policies and programs, and statewide or community-wide changes in smoke-free policies and norms are effective in reducing the initiation, prevalence, and intensity of smoking among youth and young adults.* (Benjamin, 2012, p. 8.)

### 1.3 School-based smoking prevention programmes

Schools continue to be a particularly popular setting to deliver youth smoking prevention and cessation interventions (Thomas et al., 2013b). For example, a systematic review by Fanshawe et al., (2017) of smoking cessation interventions for young people found that of the 41 studies included for full review, two-thirds were delivered in schools. Despite the review's focus on cessation, not prevention, (which is the particular area of interest for this thesis) it, nonetheless, makes the point that schools remain a popular setting for delivery of health promotion programmes. The authors note that one of the reasons for this is that it is easier to recruit participants and minimise the risk of contamination (due to whole schools being randomised rather than individual students). School attendance is compulsory which means that the majority of children can be reached through school resulting in a 'captive audience' (Wolfenden et al., 2017). Furthermore, given that smoking experimentation is mostly likely to occur in school, this makes school an obvious setting for smoking prevention or cessation programmes.

However, evidence of the effectiveness of school-based prevention programmes is mixed and outcomes vary by the type of programme delivered (Flay, 2009, Thomas et al., 2013a, Wiehe et al., 2005). For example, Thomas et al., (2013b) conducted a large systematic review of randomised controlled trials (RCTs) to investigate whether school smoking prevention interventions prevented young people from smoking. They also sought to identify which types of intervention were most effective. They identified 134 studies eligible for full review and allocated them into three groups: group 1 '*pure prevention cohorts*' which included cohort studies with '*never smokers*' at baseline followed up at various time points, and the number who remained never smokers recorded; group 2 '*change in smoking behaviour over time*' where measurements of smoking behaviour were reported as changed over time; and group 3 '*point prevalence of smoking*' included studies that reported smoking prevalence at baseline and follow-up but did not follow-up the same people, and thus reported cross-sectional data. They also considered the type of education curriculum used to teach smoking prevention, which were grouped into five categories: 1) information-only curricula; 2) social competence curricula; 3) social influence curricula; 4) combined social competence/social influences curricula and; 5) multimodal curricula.

A variety of educational engagement methods were used including: lectures, quizzes, collages, puppet plays, debates, role-plays, making videos, discussions of videotaped role-plays, films, interactive internet programmes, and meetings with role models.

Delivery was usually facilitated by the classroom teachers, but the authors noted that it could have also included: researchers; health educators; science teachers; undergraduate and graduate students; community members; and peers.

The authors conclusions are detailed and complex but of particular importance was the finding that there was a significant effect on smoking prevalence in the group 1 studies that followed students for more than one year, noting that

*Pure Prevention cohorts showed a significant effect at longest follow-up, with an average 12% reduction in starting smoking compared to the control groups.*  
(Thomas et al., 2013b, p. 2.)

Curricula modes that showed a statistically significant effect at the longer follow-up period were those that 'combined social competence and social influence' approaches. They also reported that despite social influence being a popular approach, it was not effective on its own. Finally, the authors noted that interventions delivered by adults may be more effective than peer-led programmes in the longer term. Interestingly, this finding was not endorsed by NICE guidelines on delivery of school-based interventions to prevent smoking in children and young people which recommends both adult and peer led interventions (NICE, 2010).

Findings from Flay's earlier review (2009) (which involved a meta- analysis and critical review of existing systematic reviews of school-based smoking prevention programmes) concluded that their effectiveness was weak with no evidence supporting long term effects. However, both Thomas et al., (2013a) and Flay (2009) noted the methodological challenges faced when trying to extrapolate from the existing evidence base due to a variety of factors which include: student attrition (including poor reporting of student attrition); variation in outcome measures for tobacco use; and poor reporting of interventions. Further, the requirement to include longitudinal follow-up to examine long term effectiveness required funding which is difficult to secure. Thus, it is not surprising that health behaviour change researchers have noted that:

*School-based interventions have shown promise, although their long-term effectiveness and the quality of existing evidence has been questioned*  
(Holliday et al., 2016, p. 946.)

One of the reasons for this are the demands schools face to deliver the core school curriculum and the emphasis on academic achievement, which means that delivering smoking prevention may not be considered a priority. Also given the downward trajectory in adolescent smoking, schools may not see smoking prevention as a priority area in comparison to other risk factors and health and well-being objectives. There is also a debate around the suitability of authority figures such as teachers who assert power and control over students and also may not deliver the programme with the fidelity required (Audrey et al., 2008).

The final criticism of the existing evidence base on school-based interventions for smoking prevention is its focus on effectiveness, with less discussion of the factors that influence this. The reviews mentioned above have excluded qualitative studies, which could offer greater insight into the contextual factors that may influence delivery and outcomes. This PhD will help to address this evidence gap by conducting a qualitative systematic review of the barriers and facilitators to the delivery of school-based smoking prevention programmes (Chapter Three).

#### **1.4 Social network interventions using peer approaches**

In recent years there has been increasing interest in 'network interventions' that attempt to use social networks to create health behaviour change. One approach is to identify 'champions' or 'opinion leaders' to diffuse information and promote behaviour change (Thomas, 2012, Valente and Pumpuang, 2006). The use of a 'peer-led', student champion approach in schools, has the benefit of peer educators being similar in age, which could facilitate communication of health promotion programmes in a less formal and more relaxed manner than teacher-led classroom-based, programmes. In addition to this, there are also personal development opportunities for the peer educator (e.g., increased knowledge, communication skills, confidence and self-esteem (Backett-Milburn, 2000, Forrest et al., 2002). However the effectiveness of peer-led interventions is mixed and they have been criticised for over representation of 'high achievers' – i.e., students who volunteer or are selected to take part by the school which could result in them lacking the credibility to influence 'low achievers' who are most at risk of becoming smokers (Harden et al., 2001). Audrey et al., (2006) also note that for the peer educator themselves, their role can create feelings of anxiety if they are not taken seriously by their peers or they lack confidence to deal with challenging situations. Despite this, peer-led approaches can be more effective than other forms of health promotion engagement

with young people (Ochieng, 2003, Ayaz and Açıl, 2015, Forrest et al., 2002, Bilgiç and Günay, 2018).

## 1.5 ASSIST

The aim of ASSIST (A Stop Smoking in Schools Trial) is to promote smoking prevention in adolescents. It does this by identifying 'opinion leaders' in S1 (aged 12 to 13 years) and S2 (aged 13 to 14 years) who are trained to become 'peer supporters' and have informal conversations with other students about the risks of smoking and the benefits of being smoke-free (Audrey et al., 2006). The programme consists of seven sessions, delivered over a 14-week cycle by external trainers. Table 1.1 summarises the key elements of ASSIST and Figure 1.1 is the ASSIST logic model which summarises the theory of change for ASSIST and the key intervention components and key outcomes. Both Table 1.1 and Figure 1.1 are expanded upon below.

ASSIST is grounded in diffusion theory (also referred to as diffusion of innovation theory), which explains how new ideas and social norms are introduced and spread throughout communities (Rogers, 2003). Diffusion theory relies on identifying influential people (also referred to as 'opinion leaders' or 'champions') who have expertise and credibility among their peers to promote/create new social norms (Valente, 2012). Social networks are a crucial component in diffusion theory. The size and composition of the network determines the spread of diffusion and the likely impact on behaviour change. This means that the method used to identify opinion leaders is key. For ASSIST a 'peer nomination' approach using social network analysis is used to identify students who are then invited to become peer supporters. This process is described in Table 1.1 and requires the whole school year to come together to conduct a short questionnaire and answer the following four questions:

1. Who do you respect in **your year** at your school?
2. Who are good leaders in sports or other group activities in **your year** at your school?
3. Who do you look up to in **your year** at your school?
4. Who have you had a conversation within **your year** at your school today?

This process generates a list of names which are scored and ranked in order and students with the most nominations are invited to become a peer supporter. The peer

nomination process is deliberate in its design to include the whole school year, with student nomination lead by the students, not the school. This approach can be challenging as trainers have to manage the school expectations regarding how much influence the teaching staff will have over the students who become peer supporters (Audrey et al., 2008).

Despite this potential logistical challenge, Holliday et al., (2016) found that peer nomination process was successful at identifying students with the required level of social capital and network density to disseminate smoke free messages within their social networks. The authors further concluded that the peer nomination approach used in ASSIST could be used to identify young people with the required social influence to create health behaviour change in other areas.

*“The standardized approach used in ASSIST could be replicated to nominate socially influential young people for other informal health promotion initiatives”.*  
(Holliday et al., 2016, p. 952.)

Once potential peer supporters are identified they are invited by their class teacher to attend a ‘peer recruitment’ meeting. As described in Table 1.1 this takes place over one class period, delivered by the ASSIST trainers who inform them about the programme and what their role as a peer supporter would be. After the meeting students are given the opportunity to decide if they would like to take part or not. Those that decide to become a peer supporter are then taken to a venue outside of the school to attend a two-day training course to teach them about the benefits of being smoke free and also the personal and social skills required to initiate an informal conversation with their peers. After the training students are encouraged to diffuse the information they have acquired and are supported by four follow-up session delivered by trainers in schools, over one class period.

Importantly, the student information sheet on being a peer supporter from the 2014 ASSIST delivery manual states that,

*Your role will be to talk about smoking in your everyday conversations with your friends in your year at school.*

This means that peer supporters are not actively encouraged to speak to people out with their school year, i.e., in their wider the social networks. This policy may be overly

restrictive and limit the diffusion of smoking prevention messages, which is the aim of the programme. This is an important point, that underpins one of the key arguments for this thesis which is that greater consideration should be given to encourage peer supporters to speak to **anyone** in their social network, not just friends in their school year.

**Table 1.1: Essential elements of ASSIST**

Peer nomination	Conducted in school, the entire year group is brought together to complete a peer nomination questionnaire. Students are asked to nominate students in their year who they look up to, respect and view as good leaders. This takes around 20 minutes and trainers then rank the number of nominations to produce a list of students in the year with the most nominations (this has to be 18% to ensure adequate coverage) who are then invited to become a peer supporter. Care is taken not to mention smoking as this may influence nominations.
Peer recruitment	Conducted in school, usually consisting of one class period lasting around 30-45 minutes, students are introduced to ASSIST and the peer supporter role which includes two days of training away from school. They are given information about the benefits of taking part and invited to participate, but it is made clear that it is their decision whether to take part or not. Consent forms for parent/carer to sign are sent home.
Peer supporter training	Conducted in a venue away from school (e.g., hotel, community venue). The aim is to promote learning around the risks of smoking and the advantages of being smoke-free in an informal and supportive environment. Training is delivered through games, role play and group work. Once trained, peer supporters are asked to have informal conversations with peers over a 10 week period and record these in a diary.
Follow-up sessions x 4	After training peer supporters meet with ASSIST trainers 4 times over the 10 week cycle in school, usually during class time lasting around 30–40 minutes. This is an opportunity for peer supporters to share their experience, discuss any problems and raise questions to help consolidate their skills and knowledge and encourage them to have informal conversations. It also enables trainers to monitor progress and check diaries.

## 1.6 ASSIST evidence base

ASSIST is one of a few school-based, peer-led, smoking prevention programmes that has been shown to be effective in reducing regular smoking in adolescents (Campbell et al., 2008a). It was developed in the 1990s and evaluated via a large-scale cluster

randomised trial of 59 schools in South Wales and Avon. Results from the trial found that ASSIST was effective and cost effective at reducing regular smoking in young people aged 12-13 (Hollingworth et al., 2011, Campbell et al., 2008a). Students were followed up over a two-year period and the primary outcome measure was smoking prevalence in the past week. The odds of being a smoker in the intervention group at one-year follow-up were 0.77 (0.59–0.99), which was statistically significant ( $p=0.043$ ). By year two follow-up the odds of being a smoker had increased to and 0.85 (0.72–1.01) with no statistical significance ( $p=0.067$ ), which as noted by the authors, suggests an ‘attenuation’ of intervention effect over time (and is to be expected as smoking increases with age, discussed further in 2.4.1). However, findings from multi-level modelling (using baseline, year one and year 2 follow-up data) found that the odds of being a regular smoker in an intervention school compared with a control school had dropped by one fifth (22%, odds ratio 0.78 [95% CI 0.64–0.96]). Based on these findings the authors concluded that,

*“if implemented on a population basis, the ASSIST intervention could lead to a reduction in adolescent smoking prevalence of public-health importance”*

(Campbell et al., 2008a. p. 1595.)

Further support for the ASSIST intervention comes from a 2014 systematic review of interventions and policies to address socio-economic inequalities in adolescent smoking, which identified ASSIST as having a positive equity impact and reduced smoking inequalities in school children (Brown et al., 2014b). These findings have contributed to the wider roll out of ASSIST in many parts of England and Wales and pilot implementation in France, Northern Ireland and Columbia (Dobbie et al., 2019). They have also supported the adaptation of the ASSIST model to address other risk-taking behaviours and health promotion activities. Examples include: healthy eating and physical activity – AHEAD (Bell et al., 2017), physical activity in young women - PLAN A (Sebire et al., 2016), drug prevention – ASSIST+FRANK, FRANK Friends (White et al., 2017), sexual health (STASH) and preventing gambling related harm (PROGRAM-A). ASSIST is now a licensed programme managed by a not-for-profit company called Evidence to Impact <http://evidencetoimpact.com/assist/> (previously called DECIPHER-IMPACT) which provides training, a detailed delivery manual, ongoing support and quality assurance to maintain effective delivery of the programme.

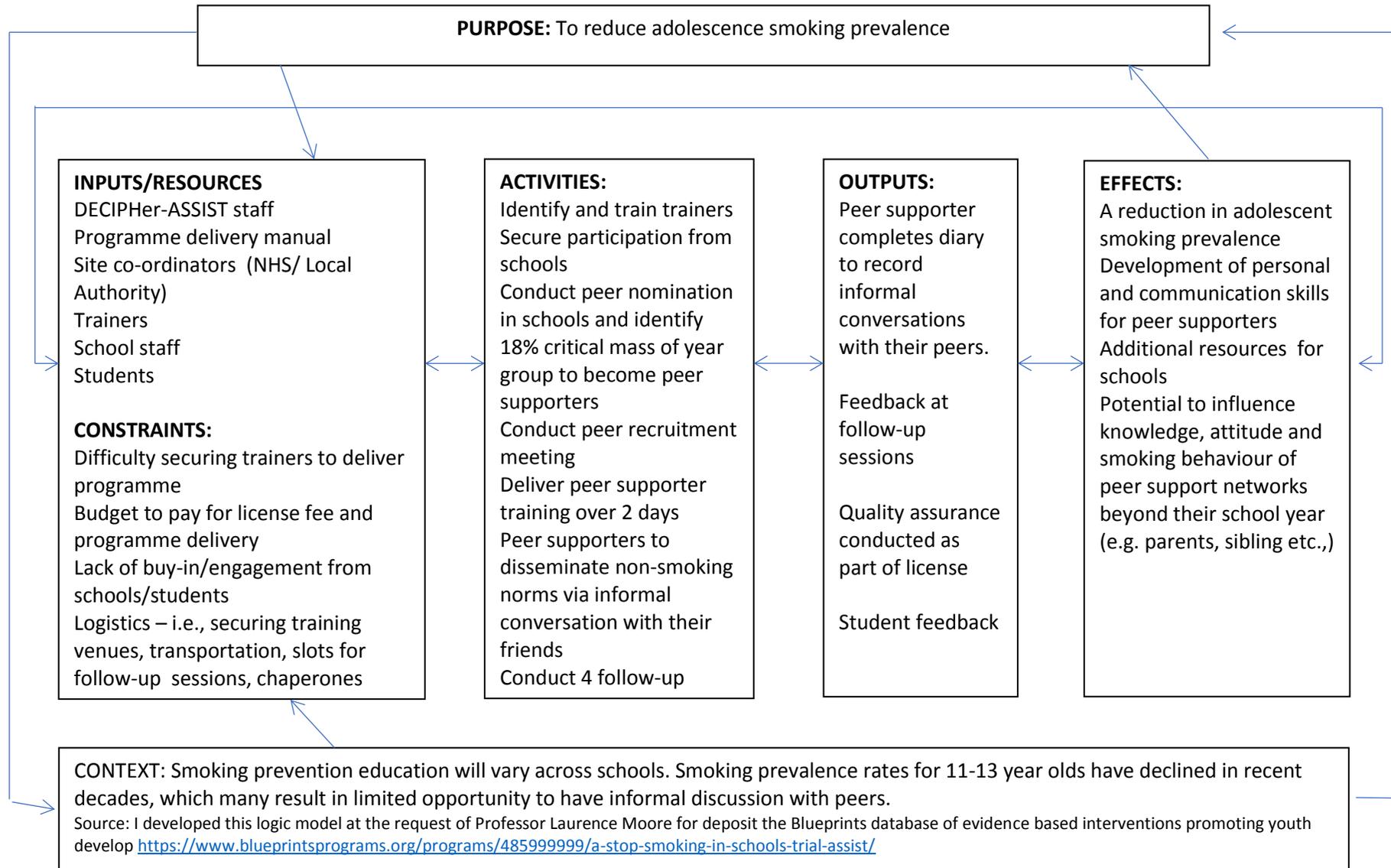
As illustrated in the ASSIST logic model there are number of requirements that need to be met to maximise successful delivery of the programme. These include: school buy in to support the set-up of ASSIST in school and follow-ups; finance to pay for the license fee, fund trainers and deliver the training (which includes buses to get the students to and from the training venue); and delivery materials (e.g., post it notes etc). As noted in the 2017 process evaluation of the pilot delivery of ASSIST in Scotland these requirements (especially finance) could preclude wider roll if Local Authorities or Health Boards lack funding and/or deem other priorities to be more important (Dobbie et al., 2017). This point was illustrated in the ASSIST Scotland process evaluation report by a stakeholder who was reflecting on the worth of the programme,

*“It’s an expensive programme and you’ve got, it’s got to address a need that is there, an identified need. Now if your need is not there, why would they spend that level on a programme particularly on one topic area? I don’t think it is the best way forward. Especially targeting it at an age group where there is, you wouldn’t identify that as a specific need. I think it would be better to look at something that is maybe more health improvement, a generic focused programme, and I think peer education is a brilliant way of working but to just focus it on tobacco I think is too narrow.”*

(Dobbie et al., 2017, p. 50.)

This point also illustrates the dated evidence base in which the effectiveness of ASSIST is grounded in. Data from the 2008 RCT was collected in 2001 which is now two decades old. Despite this, the Scottish Government decided to implement ASSIST in Scotland without conducting a definitive RTC (which would look again at the effectiveness of the intervention and update the evidence base) and conducted a process evaluation instead. Since the RCT was conducted the context of adolescent smoking has changed considerably, with smoking prevalence rates declining and further tobacco control policy implemented. This means young people are growing up in a society which no longer normalises tobacco consumption. Thus, it could be argued that the cost to deliver ASSIST (i.e. to pay the license fee and secure external staff, training venues etc.) is no longer viable. If it cannot be demonstrated that the investment in ASSIST is worthwhile, the longevity of ASSIST is doubtful . One simple and potentially cost-effective extension to ASSIST is to extend the potential reach of message diffusion beyond the school year and into the peer supporter wider social networks. Exploring this in more detail is the intention of this thesis.

**Figure 1.1: ASSIST Logic model**



## 1.7 ASSIST in Scotland

Despite the wider role out of ASSIST in England and Wales and an estimated 160,000 students taking part in ASSIST (overall), it was not until 2014 that ASSIST was delivered in pilot schools across Scottish schools (Evidence to Impact, 2020). This would not have been possible without the Scottish Government's pledge in its 2013 tobacco control strategy 'Creating a Tobacco Free Generation' to,

*“undertake a pilot of ASSIST, which will consider its suitability for Scotland and potential for further adaptation to other risk-taking behaviour*

(Scottish Government, 2013. p16.)

A process evaluation only (not an effectiveness RCT) was deemed appropriate by the Scottish Government for two reasons. First, there was existing evidence to demonstrate that the programme was effective at reducing smoking prevalence in adolescents. Second, the Scottish education system is different to England and Wales. Scotland follows a different curriculum, qualifications are awarded by one body (Scottish Qualification Authority), and the Scottish Parliament retains legislative control over all education matters. This made examining the implementation of ASSIST in Scottish schools an important area for research (Dobbie et al., 2017).

Findings from the process evaluation in Scotland showed that the programme was delivered with a high degree of fidelity to the licenced programme and was acceptable to the students and school staff (Dobbie et al., 2017). For example, the programme was delivered within the designated delivery period, the 18% threshold was met for peer supporter recruitment and students were, in general, supportive and enthusiastic about the delivery approach. However, the authors noted that the extent of message diffusion was 'ambiguous' with findings from both the student survey and qualitative stakeholders interviews querying the extent of message diffusion within the school year. Results from the student survey found that 9% (n=145) of students recalled a conversation with a peer supporter about smoking. This was considerably lower in comparison to the 23.8% of students who took part in the 2008 definitive RCT of ASSIST and recalled a conversation when asked the same question (Campbell et al., 2008a). The authors of the Scottish process evaluation report posited two explanations for the low level of message diffusion (Dobbie et al., 2017). First, was the theory in which ASSIST is rooted in, diffusion theory, which relies on peer supporters having informal, casual conversations with their peers.

Remembering these types of conversations can be difficult which could mean they were under reported in a survey. Next, was the importance of considering the context in which ASSIST was delivered in Scotland. For example, delivery of ASSIST in Scotland was at a time of low adolescent smoking prevalence, which could have made it harder to initiate conversions and, therefore, contributed to the low volume of conversations that took place.

Further, the authors also noted that the evaluation design did not take into consideration the wider extent of message diffusion beyond the school year (Dobbie et al., 2017). This means that the focus of the process evaluation was narrowed to factors affecting implementation and message diffusion in the school only and did not look at the extent of message diffusion beyond the school year. This criticism can be extended to the broader body of ASSIST literature, highlighting a gap in the evidence base, particularly in relation to understanding the extent of message diffusion or conversation influence (Holliday et al., 2016).

In light of this, I propose that there are three under researched areas concerning the delivery of ASSIST. First, is a greater understanding of **who peer supporters are speaking to in their social networks** – e.g., is it other students in their year group only (as peer supporters are advised) or are they reaching out to other members of their network? This is important because if there is evidence to show that diffusion extends further than the school year, ASSIST may have the potential to reach beyond peer supporters and into their wider social networks and local communities, thus creating wider impact. Second, is a greater understanding of the **context in which these conversations take place** (e.g., how conversations are initiated, what communication methods are used, what is discussed?). If the decision is made to extend the reach of ASSIST beyond the peer supporter school year and into their broader social networks, generating a deeper understanding of the context in which conversation occurs (e.g., who, why, where and how) will aid modification of the existing user manual and peer supporter training. Third, what is **perceptions of the influence** of the informal smoking conversations peer supporters are encouraged to have? This will aid any future consideration regarding whether extending the reach of message diffusion into peer supporter networks is desirable or not. Exploring these unanswered questions is the purpose of this PhD.

## 1.8 Context and thesis structure

The starting point for the thesis was 2014 when one of my supervisors (Professor Bauld) was awarded a grant from the Chief Scientist Office (CSO) to conduct a process evaluation of the pilot delivery of ASSIST in Scotland (as discussed above in section 1.7). I was the Research Fellow and responsible for delivering the study. By this point I knew that I wanted to further my career in academia (having previously spent 15 years as an applied public health researcher/commissioner, in the public, private and voluntary sector). However, in order to achieve this goal, I needed to consolidate my existing skill set and develop new skills (primarily in academic writing, but also methodological skills in systematic reviews and social network research). Thus, after considerable thought and discussion I made the decision to embark on a part-time PhD, which commenced in May 2014.

The ASSIST Scotland process evaluation presented an ideal opportunity to pursue a part-time PhD, but the challenge was to find a suitable project linked to the wider evaluation that would make an original scientific contribution and also address the personal development needs outlined above. The starting point was, therefore, to engage with the literature to develop a greater understanding of adolescent smoking behaviour and school-based smoking prevention programmes to help me identify an appropriate area for investigation. This resulted in Chapters Two and Three of my thesis (one literature review and one systematic review). The first literature review (Chapter Two) **focuses on young people and smoking**, exploring and critically assessing adolescent smoking trends, prevalence and key influencing factors, with a specific focus the role of peer influence. Next, is Chapter Three which is an **update to an existing qualitative systematic review** (SR) conducted in 2009 by my principal supervisor Professor Bauld (Bauld et al., 2009). This SR looked at the barriers and facilitators to delivery of school-based smoking prevention programmes. Aside from updating the existing evidence base, it also informed my thesis aim and research questions, and fulfilled one of my development goals – to conduct a systematic review.

It was from these two reviews (and through discussion with my supervisors and co-investigators from the ASSIST Scotland process evaluation) that the overall aim of my thesis was clarified - ***to examine whether ASSIST has the potential to influence smoking behaviour, attitudes, and knowledge of smoking related harm, beyond the school year.***

Given that ASSIST is a social network intervention, the final literature review (Chapter Four) looks at the social network literature. In addition to helping guide my research design, this chapter looks at three key areas of contextual and methodological importance to this thesis. The first, is an orientation into **what social network analysis** is with a brief historical overview charting its rise in popularity since the 1930s. Then, to inform my research design, I will review the **different approaches to collecting and analysing network data** using quantitative, qualitative and mixed method approaches. The final section is broader in scope to look at **social networks and health behaviour change**, which is highly relevant due to ASSIST being one of a few examples of an evidence-based network intervention.

This immersion in the literature guided development of the thesis aim (presented above) and the following research questions for my empirical research study:

1. What do the social networks of ASSIST peer supporters look like?
2. What is the potential extent of message diffusion in peer supporter networks and how does this compare with the actual extent of message diffusion?
3. What factors influence who peer supporters choose to speak to/not speak to about smoking and what are the reasons for this?
4. What is the context in which conversations take place and their content? (e.g., where and how conversations are initiated, what communication methods are used, what is discussed?).
5. How do peer supporters feel about initiating and having informal conversations about smoking?
6. What perceived influence, if any, do peer supporter conversations have on smoking behaviour, attitude and knowledge of social network members?
7. What are the implications and recommendations for any future delivery of ASSIST, specifically, and network intervention science more broadly?
8. What are the methodological contributions to qualitative social network research in general and working with young people in particular?

Chapter Five (methods) considers how these research questions can be addressed via an empirical research study and outlines the research design, recruitment and analytical approach.

There are three results chapters, presenting findings from the primary data collection phase. The first results chapter (Chapter Six) **critically reflects on the application of my chosen mode of data collection** – the creation of egocentric sociograms using

concentric circles with additional detail captured using post-it notes and coloured dots. This approach has been used with adults but a review of literature found no published studies reporting on its use with young people. Thus, reflection of the strengths and weakness adds insight to the fields of social network analysis (SNA), qualitative interviewing and respondent drive recruitment.

Chapter Seven starts to explore the **potential and actual extent of message diffusion** into peer supporter's wider social networks. This requires the use of 'formal' social network analysis to understand the size, structure and composition of peer supporter social networks. Chapter Eight builds on this by drawing on the qualitative narratives that accompanied the sociograms to generate a greater understanding of the context in which conversations took place (e.g., why peer supporters choose to speak to some people and not others; how they set about initiating a conversation, as well as where and when conversations took place). In addition to this, Chapter Eight also explores the conversation content (e.g., what did they talk about, what was the perceived outcome, how did they feel after the conversation?).

Each of the chapters outlined above concludes with a summary of the key findings. These are then synthesised in the **final discussion chapter** (Chapter Nine). After summarising the key findings and broader contribution to knowledge and research methodology, this chapter considers the implications and recommendations, and is then followed by the strengths and limitations of the thesis. Chapter Nine ends with conclusions.

## **Chapter 2: Young people and smoking: initiation, prevalence, and explanatory factors**

### **2.1 Introduction**

The aim of this first literature review chapter is to orientate the reader into the subject area in which this thesis is situated - adolescent smoking. The chapter is organised into three sections. First, it will review and critique existing sources of smoking prevalence data for Scottish adolescents. This provides context to discuss the most recent smoking prevalence data for Scottish adolescents. Next, section 2.3 will critique existing models that attempt to explain the stages in adolescent smoking development and smoking behaviour. Then, the final section will discuss some of the key factors that influence adolescent smoking behaviour which, include: age, gender, socio-economic status, family and peer influence. A particular focus will be consideration of peer influence on adolescent smoking behaviour, drawing on the social network analysis (SNA) literature. By reviewing the SNA literature, I will argue that SNA aids our understanding of adolescent smoking in two ways. First, it highlights the importance of peer influence, peer selection (SNA scholars have criticised the existing evidence base on peer influence, with its focus on peer pressure being too linear) and peer beliefs. Second, it points a lens on different types of peer groups (e.g., isolates, cliques and liaisons) and considers how they may influence smoking behaviour.

A description of the search strategies employed for this literature review (and Chapter Four) is found in Appendix 1. The discussion will draw on both the international and the UK literature.

### **2.2 Adolescent smoking prevalence data in Scotland**

There are several quantitative data sources of adolescent smoking prevalence and trends. In Scotland alone data sources include: Scottish Schools Adolescent Lifestyle and Substance Use Survey (SALSUS); Health Behaviour of School-aged Children (HBSC); Scottish Health Survey; Scottish Household Survey; and the Youth Tobacco Policy Survey. Thus, care is required when deciding which data source to use, with comparability dependent on factors, such as the method of data collection, sampling strategy and measurement of smoking status used. With this in mind, and in addition to the focus of this thesis being Scottish adolescents,

analysis of prevalence and trend data will primarily focus on Scotland, with UK comparison where appropriate.

### **2.2.1 Scottish data sources**

In Scotland the two key data sources are the HBSC and SALSUS. Further description of each is presented in Appendix 2, with the remainder of this section reviewing key elements of each survey. Both surveys share a similar function and purpose - to improve understanding and knowledge of adolescence smoking behaviour and to inform, monitor and evaluate tobacco control policy. HBSC has an international and broader focus so secondary analysis of these data is more common than SALSUS, which is Scotland specific. However, SALSUS is used by the Scottish Government to measure progress in achieving targets set out in their Tobacco Control Action Plan and impact of tobacco control policy (Scottish Government, 2018). Both surveys have a number of different strengths that collectively create a more cohesive and robust picture of adolescent smoking in Scotland. For example:

1. the sample for SALSUS is large enough to provide area specific data at a Local Authority and Health Board level, the HBSC Scottish sample is not
2. SALSUS collects more in-depth information on tobacco use than HBSC (due to the HBSC capturing a broader range of data on adolescent health and well-being in general)
3. HBSC has been running longer than SALSUS, resulting in longer trend data and places Scotland in comparison with Europe and North America.
4. HBSC includes 11-year olds (in primary seven) an important age group in the stages of adolescent smoking, which SALSUS does not.

#### **2.2.1.1 *Data collection method***

HBSC is an international study with varying levels of resource available from each country, raising several methodological, sampling and analytical challenges which are out of scope of this discussion (see Roberts et al., 2009, for a summary). For the majority of schools (including Scotland) the HBSC data is collected via a repeat cross-sectional, self-complete survey administered by teachers, ideally under exam conditions. The same method of data collection is used for SALSUS. This approach may influence survey completion by students who have a concern that teaching staff could possibly see their answers. However, both surveys try to mitigate this by instructing students to place completed surveys into a sealed envelope and

not to write their name on either the questionnaire or envelope. The ideal approach would be for independent researchers to go into schools to administer the questionnaire and leave with them, but costs associated with this would be prohibitive.

A final consideration is that both surveys are reliant on self-report data to measure smoking status – i.e., asking young people to write down the number of cigarettes they have smoked. Despite self-report being the only practical and cost-effective means to collect these data, there is debate over its accuracy. A systematic review by Gorber et al.,(2009) concluded that self-report surveys generally present an under estimation of cigarette consumption. However, a study by Dolcini et al., (1996) found that the difference between adolescent self-report and biochemical validation of smoking status was negligible.

### *2.2.1.2 Survey design and delivery*

HBSC covers a broader age range than SALSUS, and includes children aged 11 in their last year of primary school as well as children aged 13 and 15 in the first two years of secondary schools. The questionnaire for the youngest age group is shorter in length, resulting in some questions being excluded to ensure it could be completed within the time available (Inchley et al., 2020). Tailoring survey design like this is an important consideration for accuracy of completion, especially if the questionnaire has routing which young people often ignore. In addition, there are issues to consider such as students with additional support needs (dyslexia, for example). For both surveys it is not clear how these factors are addressed. Nor is it clear what approach was taken to cognitively test and pilot delivery of the survey to ensure that the instructions are clear and understood by the target age group.

### *2.2.1.3 Sample*

Both surveys have fairly similar and consistent response rates, which have generally been in decline, in both school and class response. The 2014 HSBC Scotland report notes that the main reason for class non-response was the school being too busy to facilitate participation (Currie et al., 2015). Non-response is acknowledged in the SALSUS 2018 technical report (Scottish Government, 2019b) and the data is weighted to correct for non-response bias, as is also the case for HBSC. State funded, grant-maintained, and independent secondary schools are included in the sample frame but special schools, secure units and children who are home schooled are not. Schools are encouraged to follow-up with students who were

absent on the day of completion, but this will vary by school, meaning that students who truant are most likely to be underrepresented.

## **2.2.2 Scottish smoking prevalence and trends for 11-15 year olds**

Having explored the strengths and weaknesses of existing Scottish data sources for adolescent smoking prevalence, this section will present an overview of the key smoking prevalence and trend data for adolescents in Scotland aged 11-15. Factors that add context to these findings are discussed in sections 2.3 and 2.4.

### **2.2.2.1 *Smoking initiation***

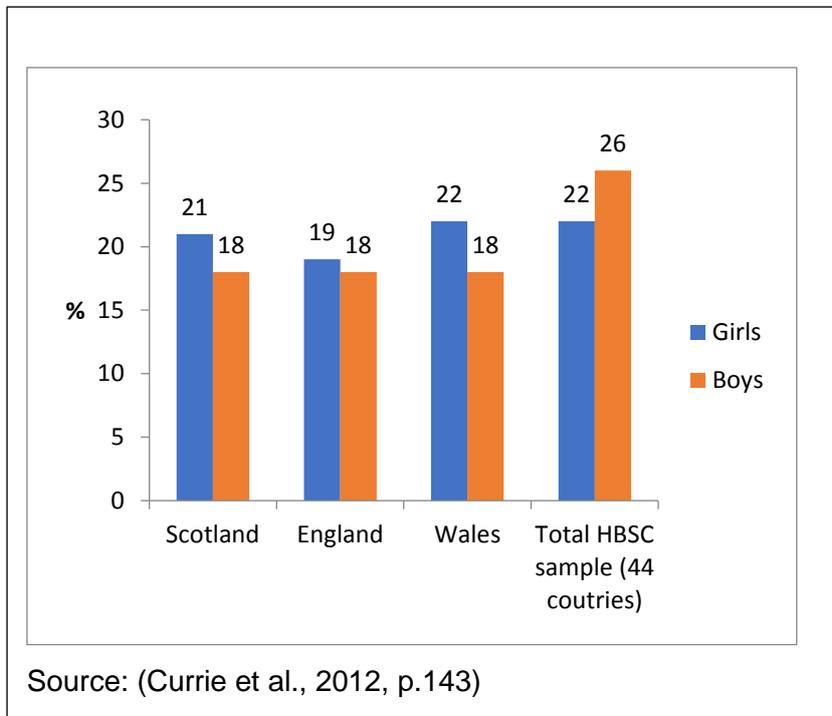
Understanding the age young people start to experiment with smoking is a key indicator of future smoking behaviour (discussed further in 2.4.1). Figures 2.1 and 2.2 present HBSC data showing the proportions of 15-year olds who reported first smoking aged 13 or younger. These data come from the international HBSC reports for 2009/10 (Currie et al., 2012) and 2013/14 (Inchley et al., 2016). The International report for 2018 was not available online at the time of writing this thesis. Comparing data across these two time periods highlights two points of interest.

First, the proportion of adolescents who self-reported smoking aged 13 or younger over the four-year period has declined across Scotland, England, Wales and the total HBSC sample. However, the rate of decline is slower in Scotland with no change for boys - smoking initiation rates have remained static at 18%, but have declined by 6% for girls. This compares with a decline of 9% for girls and 8% for boys in Wales and a 7% (girls) and 8% (boys) decline in England and 9% (girls) and 4% (boys) for the HBSC total sample. These data suggest that the decline in smoking initiation among Scottish male adolescents is not keeping up with other devolved nations and countries taking part HBSC countries.

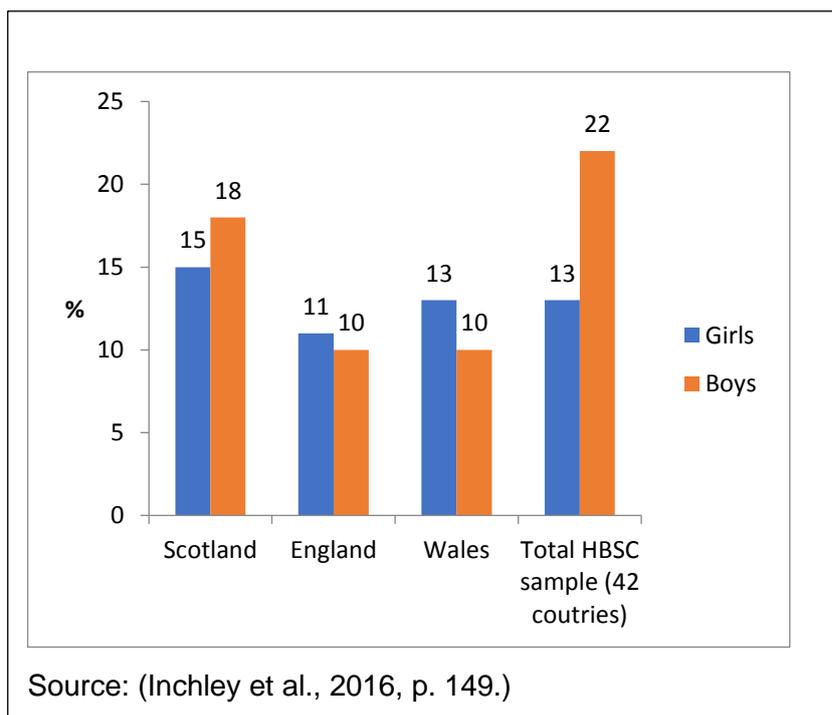
Second, there is change in gender trends, but this is specific to Scotland. Figure 2.1 indicates that for the total HBSC sample (i.e., all 44 countries who took part in 2009/2010 and 42 in 2013/2014) boys were more likely than girls to have tried their first cigarette at age 13 or younger (26% compared with 22% in 2009/2010 and 22% compared with 13% in 2013/2014). However, 2009/2010 data shows the reverse for Scotland, England and Wales with a higher proportion of girls than boys reporting that they had a tried a cigarette aged 13 or younger (e.g., in Scotland the comparable figures are 21% of girls and 18% of boys). By 2013/2014

similar findings were found (Figure 2.2), except in Scotland where the trend was reversed with boys more likely to have tried a cigarette than girls with (18% compared with 15%).

**Figure 2.1: Percentage of 15 year olds who first tried a cigarette aged 13 or younger by gender 2009/10**



**Figure 2.2: Percentage of 15 year olds who first tried a cigarette aged 13 or younger by gender 2013/14**



### 2.2.2.2 *Smoking prevalence*

Figures 2.3. and 2.4 present smoking prevalence trend data by age and gender from SALSUS and the HBSC international reports. This approach allows for comparison across two different data sources and presents a more informed assessment of adolescent smoking prevalence in Scotland. SALSUS defines regular smoking as smoking at least one cigarette per week (Scottish Government, 2019b). The HBSC uses the term 'weekly' smoking which is defined as smoking at least once a week (Currie et al., 2014, p. 37). Thus, despite using different terminology both surveys use comparable measures of smoking status. SALSUS data extends up to 2018 however for HBSC the most recent international report was 2014.

In addition to the HBSC international report, there are standalone Scotland specific HBSC reports for 2010 (Currie et al., 2011), 2014 (Currie et al., 2015) and 2018 (Inchley et al., 2020) also available online that could have been used for this analysis. However, this would have meant mixing findings from the international and standalone Scotland specific HBSC reports. As data for both reports come from the same source, the assumption is that the same prevalence figure would be reported. However, a cross check of these reports revealed some anomalies in the data with the smoking prevalence figures not matching. For example, the 2009/2010 international report records Scottish smoking prevalence for girls age 11 and boys age 11 at 0%. However, the equivalent data from the Scottish 2010 report (Currie et al., 2011, p. 77) has a higher figure of 1% for girls aged 11 and 1% for boys aged 11. There are also differences for the 13- and 15-year olds. No explanation could be found to account for this in the published reports, but it could be due to a variation in base sample size and or weighting approach used or simply a data cleaning anomaly which is common in large datasets such as this. In light of this, Figure 2.4, therefore, uses data from the international reports only.

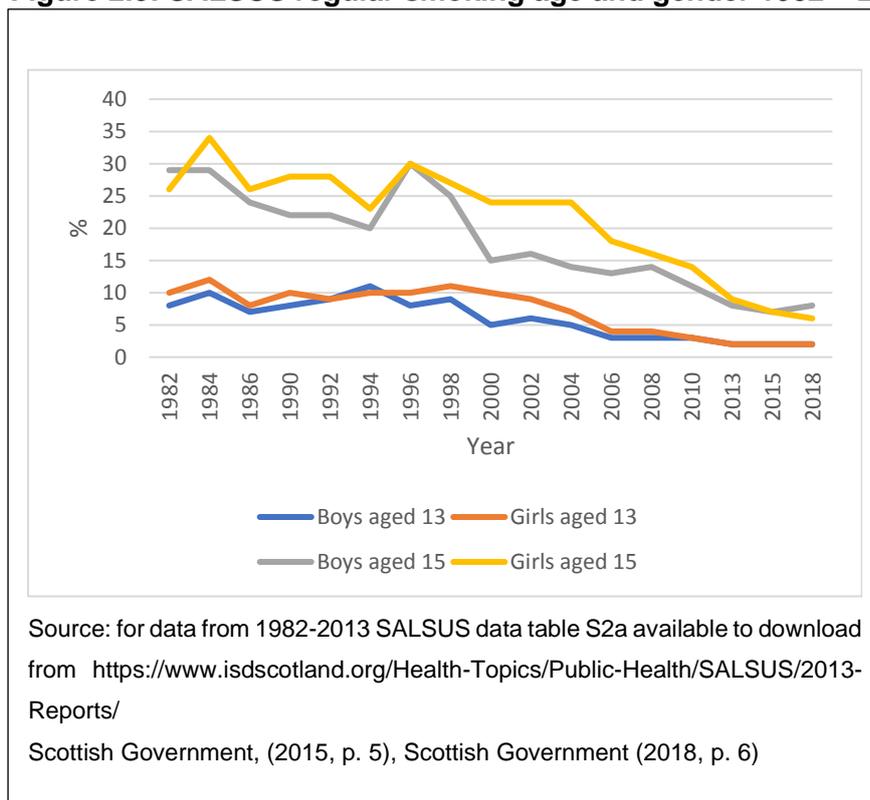
Three findings emerge from Figures 2.3 and 2.4 that are relevant to the research questions for this thesis (presented in 5.3.1). First, adolescent smoking prevalence in Scotland, like the rest of the UK, is declining. Both surveys show a fairly consistent decline from the mid-80s, with SALSUS data indicating that among 13-year olds smoking prevalence has remained low at 2% since 2013. HBSC has a higher smoking prevalence figure for 13-year olds but shows a consistent decline. SALSUS 2018 data indicates a 1% increase in smoking prevalence for boys aged 15, but this was not statistically significant.

Second, as noted by several studies (Benjamin, 2012, Goddard, 1992, Tyas and Pederson, 1998, Amos, 2009) smoking consumption in adolescence increases with age, i.e., the older children are, the greater the percentage who will smoke. For example, none of the 11-year

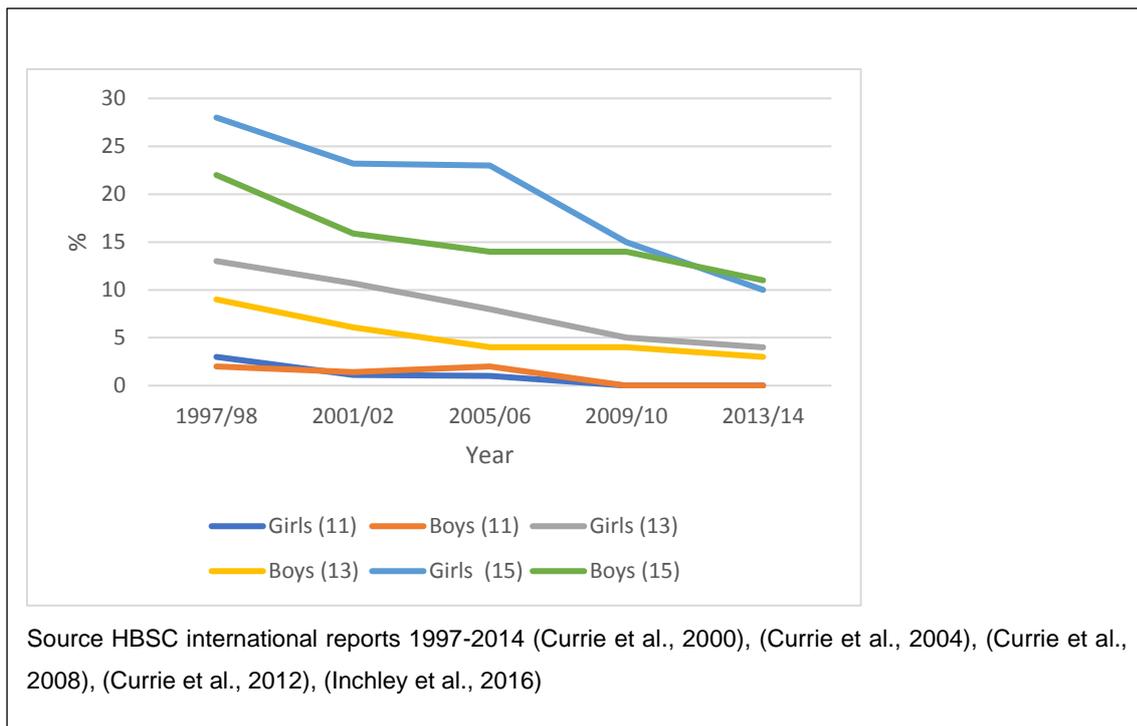
olds who took part in the HBSC in 2013/14 were regular smokers, but by age 15 this had increased to 10% of girls and 11% of boys.

Third, both surveys highlight the importance of gender and adolescent smoking. For example, HBSC data highlights that girls aged 13 and 15 reported consistently higher smoking rates from 1997/98 to 2005/06. However, by 2009/10 and 2013/14 the gap had started to narrow. Similar findings are reported from the SALSUS data with Figure 2.3 showing that girls aged 13 and 15 have generally reported a higher smoking prevalence than boys. However, from 2006 it starts to even out and continues in this trajectory to the most recent data in 2018. Thus, it would appear that influence of gender on adolescent smoking behaviour has become less important. Nonetheless, it is still important to understand the factors that could influence the gendered consumption of cigarettes and consider whether gender should still be considered in current or future adolescent smoking prevention programme such as ASSIST. I will consider these key issues further in sections 2.4.2 and 7.2.1

**Figure 2.3: SALSUS regular smoking age and gender 1982 – 2018**



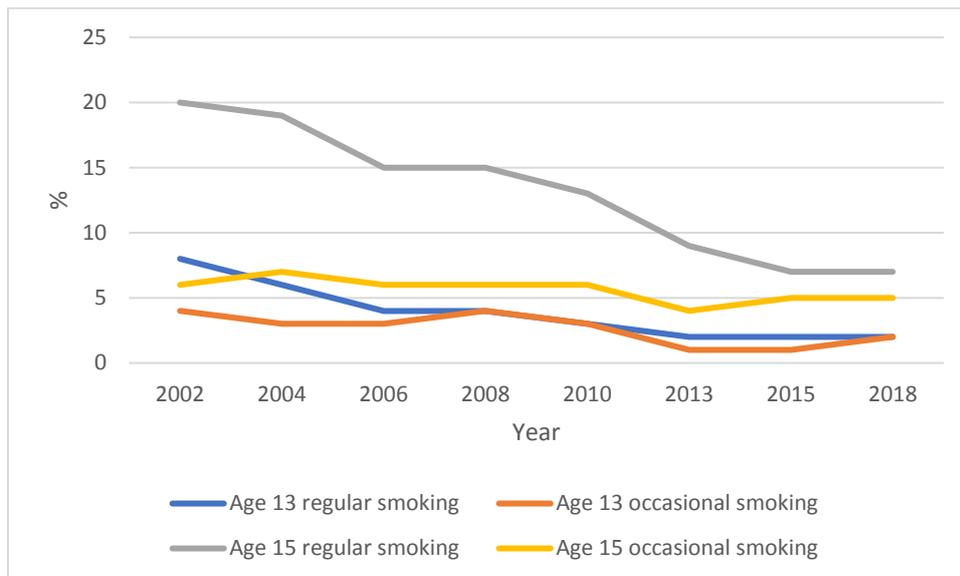
**Figure 2.4: HBSC weekly smoking age and gender 1997-2014**



### 2.2.2.3 Regular and occasional smoking

Figures 2.3 and 2.4 examined smoking prevalence using the term regular use (i.e., smoking at least once a week). Regular use is the most common used category of smoking status. However, in recent years, there has been increasing calls to include occasional smoking in addition to regular use (Department of Health, 1998). This is in recognition of the decline in adolescent smoking but also an awareness that a similar decline has not been found in occasional adolescent smokers in England and has changed little in the last decade. In light of this, Figure 2.5 compares regular and occasional smoking prevalence for Scottish adolescents using SALSUS data (HBSC does not report occasional smoking). Figure 2.5 shows that the most significant reduction is in regular smoking, with more modest reductions in occasional for both age groups. Further, data from 2015 and 2018 suggests that occasional smoking may be increasing slightly (5% of 15 years old were occasional smokers in both 2015 and 2018, with a 1% increase in occasional smokers aged 13 between 2015 and 2018).

**Figure 2.5: Regular and occasional smoking by age, SALSUS 2002 – 2018**



Source: Data from 2002 – 2010 can be accessed from this link

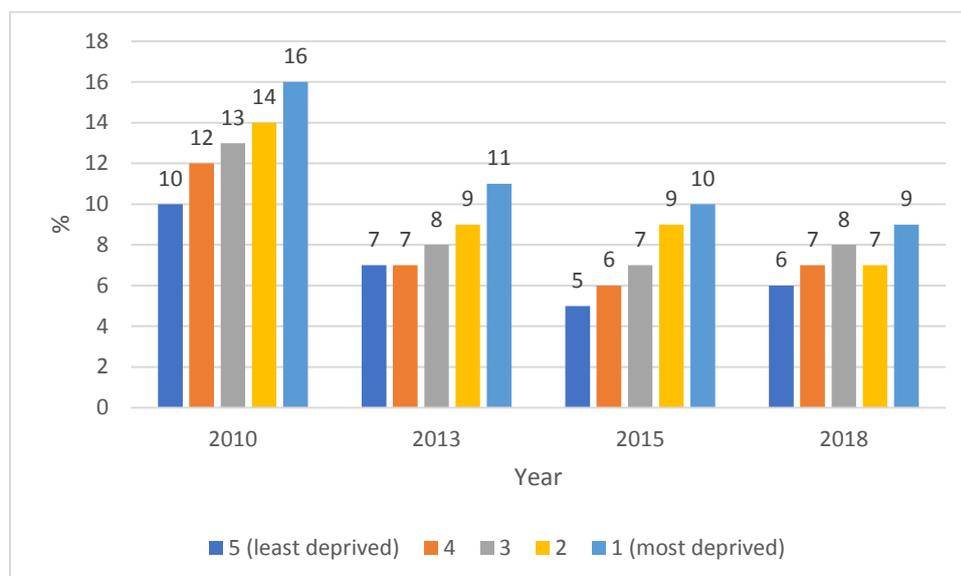
<https://www.isdscotland.org/Health-Topics/Public-Health/SALSUS/Previous-Reports/>

Scottish Government, (2014, p. 13) Scottish Government, (2016, p. 5) Scottish Government, (2019, p. 6)

#### 2.2.2.4 Smoking and socio-economic status

Figure 2.6 tracks the rate of regular smoking by deprivation quintile from 2010-2018 and like the previous figures (2.3-2.5) shows a decline over the eight-year period. However, the disparity in cigarette prevalence between the least and most deprived remains, with 15-year olds living in the most deprived areas of Scotland continuing to have higher prevalence levels.

**Figure 2.6: SALSUS 15-year-olds who were regular smokers by year and deprivation\***



\* Deprivation measured using SMID (Scottish Index of Multiple Deprivation)

Sources: the 2010 and 2013 data can be accessed here: <https://www.isdscotland.org/Health-Topics/Public-Health/SALSUS/2013-Reports/> where you download an excel spreadsheet with tables, go to table S47 and toggle between 2010 and 2013

2015 data source: (Scottish Government, 2015, p.49), 2018 data source: (Scottish Government, 2018, p.51).

## 2.3 Understanding adolescent smoking

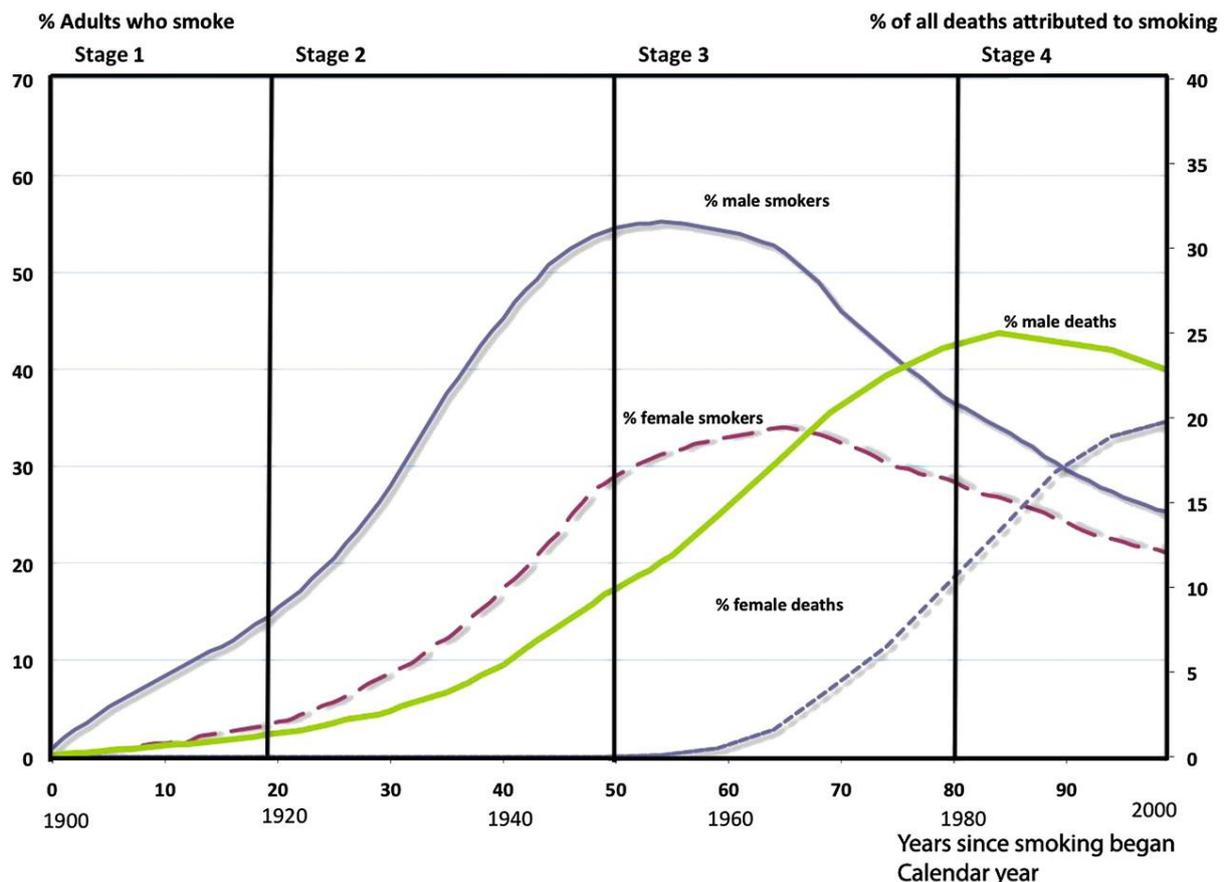
Having looked at the smoking initiation and smoking prevalence data this section will attempt to further our understanding of the factors that contribute to adolescent smoking uptake and continued smoking. Starting first with a broader perspective, I will briefly draw on Lopez's model of the tobacco epidemic which adds a contextual framework to explain some of the findings from analysis of the smoking prevalence data discussed in the previous sections (Thun et al., 2012). However, as the model is not adolescent focused, it is important to consider other models that specifically attempt to conceptualise the development stages of adolescent smoking. This is the focus of section 2.3.2. Finally, in section 2.4, I will look in more detail at some of the key factors that have been shown to influence adolescent smoking trajectories, with a particular focus on peer influence as well as age, gender, socio-economic status and family influence.

### 2.3.1 Stages of the tobacco epidemic

In 1994 Thun et al., (2012) created a four-stage model to conceptualise the trajectory of the tobacco epidemic and its effect on mortality in the developed world (Figure 2.7). The first stage

starts with the beginning of the tobacco epidemic – male prevalence will be low and female even lower (due to social and cultural factors) with smoking death and disease not visible. This will last for one or two decades. Stage 2 will last longer (two or three decades) and see a rapid rise in male smoking prevalence (50-80%), female prevalence will start to increase but will still be lower than men. Variance between socio-economic status is not evident and tobacco control measures are underdeveloped. Male prevalence begins to decline in stage 3, more so in middle aged or older men who have become ex-smokers. By the end of stage 3 (which lasts for around three decades) female prevalence will plateau and then start to decline and the gap between male and female prevalence may be as little as 5%. Tobacco control policies and smoking prevention programmes are in place and smoking starts to become less socially acceptable. By stage 4 smoking prevalence rates for men and women will slowly become almost parallel and smoke-free environments will become the norm (e.g., in the workplace, and public places like bars, restaurants and public transport for example).

**Figure 2.7: Stage of the tobacco epidemic model**



Source: (Thun et al., 2012, p. 100.)

A strength of this model is its' ability to show that the factors which influence smoking prevalence will vary depending on what stage of the epidemic a country is in, which is relevant

to adolescent smoking. For example, as we have seen in Figures 2.1 – 2.4, gender was an important factor in adolescent smoking prevalence. However, as Figures 2.3 and 2.4 also show that the gap between boys and girls has begun to narrow and there is a lack of new (i.e., recent) empirical research to explain why. By applying Lopez's model we can see that Scotland, like the rest of the UK, is in stage 4 of the tobacco epidemic which means that the introduction of tobacco control policies has contributed to the reduction in smoking prevalence and the gap between male and female smoking.

### **2.3.2 Stages of becoming an adolescent smoker**

There are several models that conceptualise the stages of adolescent smoking development that, as noted by Mayhew et al., (2000), is a reflection of the range of academic disciplines researching adolescent smoking behaviour. One of the earliest was posited in 1980 by Leventhal and Cleary (1980) via a four stage model. First, is *preparation* where the young person starts to form a self-image of being a smoker. Then comes *initiation* with the first few tries of a cigarette, this is followed by *becoming a smoker* where smoking becomes more frequent; last is *maintenance* where smoking is used in a variety of situations and for different purposes which may include pleasure, relaxation and to reduce anxiety. Flay et al., (1998) expand the maintenance stage into 'regular use' (smoking daily or every weekend) and 'addiction' (compulsive smoking to ease cravings). Further adaptations are offered by Mowery et al., (2004) who introduced a seven stage process of: never smoked and not open to smoking; never smoked, open to experimentation; early experimenter; late experimenter; former smoker; nondaily current smoker and; established smoker.

While these models present a useful lens to view adolescent smoking trajectories, they have been criticised for being too linear in focus and failing to capture movement in and out of each stage. This fluctuation can occur for a considerable period of time until a young person establishes their smoking identity (Benjamin, 2012, Wiltshire et al., 2005, Amos, 2009). As Goddard, (1992) points out,

*The onset of smoking in children aged 12-14 is seldom a single distinct event...children's smoking behaviour is much more erratic than adult smoking. There is not, in general, a steady progression from smoking occasionally to smoking regularly and then to increasing consumption.* (Goddard, 1992 p. 17)

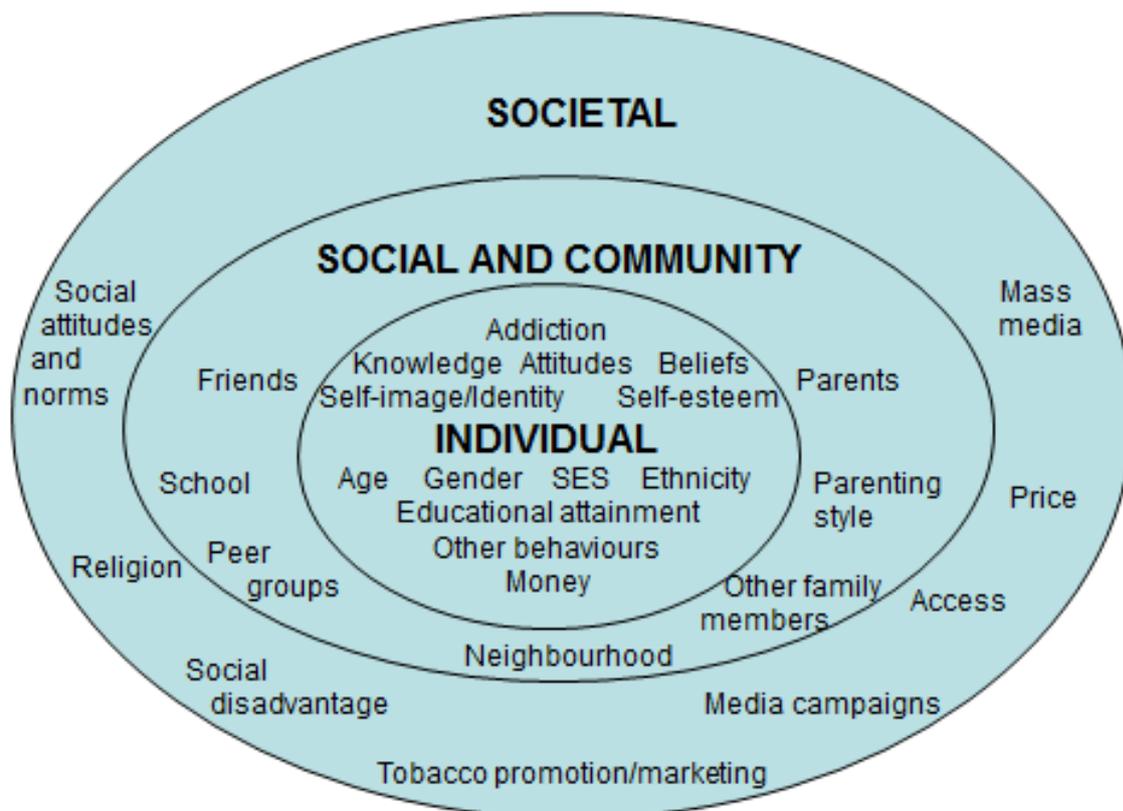
There is also a lack of empirical evidence to validate them as frameworks for measuring adolescent smoking behaviour (Mayhew et al., 2000). One of the reasons for this is the difficulty measuring progression between each stage due to the inconsistent use of definitions to measure smoking status (as we have seen already with different terminology used in the SALSUS and HBSC surveys see section 2.2.2.2). Smoking status among young people is generally defined in three ways: non-smoker; occasional smoker; and regular smoker. While these categories are transparent, the measurements used to assign categories are not. UK studies, for example, tend to define regular smoking as smoking at least one cigarette per week, whereas Benjamin (2012) notes that some American studies (such as the National Youth Tobacco Survey) define regular smoking as once a month. The Surgeon General report (2012) also noted variability in smoking definitions across surveys of adolescent smoking behaviour. For example, they noted three definitions of 'ever smoked': smoking part or all of a cigarette; smoked cigarettes at least 'once or twice' or 'ever tried cigarette smoking, even one or two puffs.' These inconsistencies make it difficult to interpret the evidence base and compare across surveys of adolescent smoking due to the risk of misinterpretation. A further consideration is the mode of data collection to categorise smoking status. For adolescents this is typically cross-sectional, self-complete surveys which lack the longitudinal data required to track how smoking identity changes over time and the factors that influence this (Okoli et al., 2011).

Some studies have also suggested that adolescent smokers do not identify with the definitions of smoking used in quantitative surveys (Okoli et al., 2011, Harris et al., 2008, Leatherdale and McDonald, 2006). For example, a qualitative study found that young people were reluctant to label themselves as one particular category of smoker (Wiltshire et al., 2005). One participant who, despite smoking 15 cigarettes per day, did not view himself as a smoker because he could be smoke free for days if he lacked the funds to buy cigarettes. Definitions of 'social smoking' also varied amongst peers. For example, one female who smoked 10 cigarettes per day did not classify herself a regular smoker because she smoked less than other people in her social network. Similar findings come from a mixed method study with adolescent girls which found that use of the term 'smoker' was widely used, encapsulating a range of smoking behaviour, such as smoking at parties, smoking occasionally, to smoking several cigarettes per day (Nichter et al., 1997). The authors concluded that the standard definitions used to describe adolescent smoking fail to capture the range of smoking behaviour because young people do not identify with terms such as 'smoker' and 'non-smoker'. However, both these studies were conducted 15-20 years ago with a slightly older age group (16-19 years old) so it is unclear how transferable these findings will be to 12-15 year olds which is the age group of interest for this thesis.

## 2.4 Factors associated with adolescent smoking

Turning now to the final section of this chapter where the focus is to discuss some of the key factors associated with adolescent smoking uptake. There is no single reason that explains why adolescents start to smoke, with several factors at play. For example, a literature review identified 25 factors associated with youth smoking which they organised under four headings: socio-demographic; environmental; behavioural and personal (Tyas and Pederson, 1998). Similar findings were found by Mayhew et al., (2000) who conducted a review of studies attempting to predict the factors that influence transition between the stages of adolescent smoking, and concluded that there was no single factor to predict smoking initiation and movement between stages of development. Attempting to separate predictors of adolescent smoking is, therefore, problematic because they are often overlapping. This is illustrated in Figure 2.8 which comes from a comprehensive review of young people and smoking by Amos et al., (2009) and summarises the range of factors that their literature review identified.

**Figure 2.8: Factors associated with adolescent smoking**



As Figure 2.8 illustrates there are numerous influencing factors, with the impact of some on smoking consumption e.g., age, gender and socio-economic status already highlighted in the section 2.2.2. Attention now turns to explore these three factors in more depth, to which family and peer influence will also be added. As noted in the introduction, discussion of peer influence will draw heavily from the social network analysis literature which highlights the importance of peer selection as well as peer influence and peer group structure.

### **2.4.1 Age**

Age is an important factor in progression through the stages of smoking development. As prevalence data shows (section 2.2.2) there is marked increase in regular smoking between the ages of 13 and 15. This is why smoking prevention programmes like ASSIST target 11-13 year olds because the majority of adults who smoke started in childhood. The 2012 Surgeon General report on adolescent smoking noted that amongst a survey of American adult smokers aged 30 - 39, 81.5% had tried their first cigarette before they were 18 years old (Benjamin, 2012). Similar findings are found in the UK; with the 2011 General Lifestyle Survey reporting that 61% of adult smokers were regular smokers before they were 18 years old (ONS, 2013). In Scotland, like the rest of the UK, there is an increase in regular smoking between the ages of 11 and 15 (Figure 2.5).

A study by Reidpath et al. (2014) found a significant relationship between age of smoking initiation and becoming a regular smoker. They reported that if an 18-year-old white male started to smoke aged eight the probability of them smoking everyday was around 60%, but if they did not start smoking until 16 this dropped to less than 20%. However, as this study was conducted with US schools, caution is required around the applicability of these findings to Scotland. Despite this caveat, the evidence base points to a strong correlation between smoking prevalence and age of initiation - the younger a person starts smoking the higher the risk that they will go on to become regular smokers and will be less likely to stop in the future (Reidpath et al., 2014, Breslau and Peterson, 1996a). This is why 2018 SALSUS data reported previously in 2.2.2.1, which showed a delay in the age of smoking initiation, is encouraging - the more smoking initiation can be delayed the lower the risk of progression to regular smoking.

## 2.4.2 Gender

Several qualitative studies have shown the importance of gender in adolescent smoking experimentation and progression to regular smoking (Grogan et al., 2009, Nichter et al., 1997, Amos and Bostock, 2007, Hoving et al., 2007). For example, a mixed methods study explored the relationship between peer group structure, gender and smoking behaviour, by mapping individual social networks and conducting qualitative interviews with young people aged 11-13 (Michell and Amos, 1997). The authors found that peer group structure was hierarchical with pupils placing themselves in a pecking order with higher status defined by being popular, attractive and fashionable. At the top of the hierarchy were 'top girls' who smoked and were under pressure to continue smoking to hold onto their superior position in the hierarchy. Boys did not have the same kind of pressure because they could acquire higher social status via sport. Other studies have found similar findings where girls used smoking as a way to gain status and create an identity to make them stand out and move away from being 'average', whereas boys were able to gain similar status through sports (Plumridge et al., 2002, Grogan et al., 2009).

A further study conducted single sex focus groups with 15 and 16 year olds to explore the 'meaning and function' of smoking from a gendered perspective – i.e., do boys and girls smoke for different reasons? (Amos and Bostock, 2007). Their findings suggest that the shared reasons for smoking for both genders were: to fit in; enjoyment; fun; or to use it as a coping strategy to relieve stress. However, they also identified gender differences. For example, girls spoke about sharing the experience of smoking – i.e., sharing a packet of cigarettes or single cigarette which strengthened friendships. Boys were less likely to do this, especially sharing the same cigarette, perhaps because it was viewed as un-masculine. Instead, boys were more likely to smoke to relieve anger, calm down and keep themselves out of trouble. Girls also spoke of smoking to relieve stress, which was often caused by boys. Nichter et al., (1997) also found that girls smoked to help them relax and relieve stress, but this was broader than 'boy stress'. They identified other factors such as: family troubles (especially relationships with parents); stress of schoolwork and fitting in. The negative aspects of smoking were also gendered - boys were concerned about the impact of smoking on their sporting abilities, while girls were more concerned about aesthetics (e.g., smell and bad breath).

Finally, when considering the contribution of gender to adolescent smoking consumption, it is important to note the perception that smoking can help with weight loss by acting as an appetite suppressant. A study by Cawley et al., (2004) conducted secondary analysis of a National Longitudinal Survey of Youth in America to explore the influence of body weight and

smoking initiation in American adolescents. They found that females were more likely to start smoking if they had a BMI (Body Mass Index) that classified them as 'at risk' or 'overweight or described themselves as overweight or were trying to lose weight.' This is not surprising considering that Grogan et al., (2009) notes girls generally feel more pressure to be thin than boys.

The above discussion, therefore, highlights that the role of gender in adolescent smoking is complex and linked to the broader factor of peer influence which I examine in more detail in section 2.4.5. It is therefore not surprising that there has been increasing support for gender specific smoking prevention programmes (Grogan et al., 2009, Amos et al., 2012). However, it is important to note that several of the studies reviewed above were conducted 20 years ago and since then there has been a raft of tobacco control policies that have contributed to a narrowing of the gender differences in adolescent smoking behaviour. It is, therefore, likely that these gendered patterns may not be found in today's early adolescents. In addition, a longitudinal quantitative study of 13 year olds explored the gender influence on transition from never smoked to smoking, and found that for both boys and girls the strongest predictors of smoking were: modelling from parents, more spending power; and intention to start smoking (Hoving et al., 2007). Based on these findings they concluded that smoking prevention programmes should address the whole peer group to de-normalise smoking, but also be tailored to address gender specific risk factors – e.g., girls given strategies to resist pressure from friends to start smoking.

However, the picture for rural areas is less clear, with a study by Levin et al., (2014) suggesting that gender differences could still exist. The authors conducted secondary analysis of 2010 HBSC data to assess whether socio-economic inequalities differed by urban and rural areas. They concluded that in comparison to boys, girls were significantly ( $p < 0.05$ ) more likely to have tried smoking (42.8% compared with 34.3%), be a current (18.9% compared with 13.6%) weekly (14.1% compared with 9.9%) or daily smoker (10.7% compared with 7.9%). Despite the caveat that this analysis is now ten years out of date, it further highlights the complexity of disentangling the role of gender in adolescent smoking and suggests that even with the recent narrowing of the gender gap, the role of gender should still be considered in future analysis of adolescent smoking.

### **2.4.3 Socio- economic inequalities**

Socio-economic status (or socio-economic position) describes societal position in relation to social or economic factors such as income, education, and occupation and is an important indicator of inequalities (Galobardes et al., 2006). Adult population studies in developed countries have consistently shown the link between low socio-economic status (SES) and smoking; more specifically higher smoking rates and lower rates of smoking cessation (Hiscock et al., 2012b, Hiscock et al., 2012a, Nagelhout et al., 2012) This link is also found with adolescence, as evidenced previously in Figure 2.6 which showed that 15-year olds living in the most deprived areas of Scotland continued to have higher levels of cigarette smoking. In addition, there are several studies that have shown that students from the less affluent areas are more likely to start smoking, progress to regular smoking and have a higher exposure to smoking through their friends and family (Glenn et al., 2017, Lorant et al., 2015, Pampel et al., 2014, Moore and Littlecott, 2015).

However, a study by West (1997) suggests that the influence of SES on adolescent smoking is more complex and may diminish as young people get older. West (1997) argues that during adolescence individual position in the social hierarchy becomes more important. This means that the once strong family influence is overtaken by peer influence and so the association between SES diminishes. West (1997) describes this as the 'equalization hypotheses', which asserts that the influence of peer group cuts across SES and dilutes the visibility of health inequalities in adolescence. Further support for this argument comes from a literature review examining the relationship between SES and five health behaviours, one of which was smoking (Hanson and Chen, 2007). Twenty-one studies were classed as 'high quality' 15 supported the theory that adolescents with low SES were more likely to smoke than those with high SES. However, the authors concluded that the link between SES and smoking in early adolescence was stronger than in late adolescence, which supports West's (1997) theory that adolescence is a period equality within SES. However, there was no detail of how the articles were assessed and categorised or if screening was double blind or not. In addition the authors acknowledge that SES measures varied across studies which Amos et al., (2009) note is a particular challenge with survey data attempting to understand the relationship between the SES and adolescent smoking behaviour. They note, for example, that one of the main data sources of English adolescent smoking behaviour, the Smoking Drinking and Drug Use Survey, uses measures that young people are more likely to find easier to answer such as number of books in the home and free school meals, rather than the more established measures such as parental occupation and housing tenure.

#### 2.4.4 Family influence

Parental influence, particularly parental smoking, as well as family structure are some of the most important factors associated with adolescent smoking (Flay et al., 1998, Barman et al., 2004, Leonardi-Bee et al., 2011) with Barman et al (2004) concluding that,

parental smoking has become a well-known and clearly demonstrated risk factor  
for adolescent smoking *(Barman et al., 2004, p. 1050)*

As noted above (West, 1997, Simons-Morton et al., 2001, Simons-Morton et al., 1999), the influence of family may become less apparent during adolescence when peer influence becomes more dominant. That said, parental influence and family structure remain of paramount importance in moulding the smoking attitudes of children and young people. The literature on the ways this manifests itself can be summarised into four themes. First, and perhaps the most obvious, is parental and sibling smoking behaviour – if parents and siblings smoke children living in these families are more likely to smoke. This is evidenced by Simons-Morton et al., (1999) who found that parents who smoke were risk factors for all of the stages associated with becoming a smoker outlined in section 2.4 Further evidence comes from a systematic review and meta-analysis of 58 studies which concluded that parental smoking was a significant influencing factor on smoking uptake (Leonardi-Bee et al., 2011). The authors also estimated that approximately 23,000 15-year olds who were regular smokers in England and Wales were doing so as a result of exposure to smoking in the home.

The effect was stronger in maternal rather than paternal smoking, a finding that has also been found in other studies (Griffin and Botvin, 2010, Distefan et al., 1998). SALSUS data provide the Scottish perspective with the 2018 survey reporting young people (aged 15), who were regular smokers, were more likely to have at least one parent who smoked daily than young people classified as non-smokers (47% compared with 17%) Scottish Government (2019a, p. 29).

Next is family structure, e.g., single parent families, families with stepparents, and 'traditional', intact families with both parents still together. Griesbach et al., (2003) explored the relationship between smoking in 15-year olds and family structure in seven European countries using HBSC data. Their analysis concluded that two of the risk factors associated with adolescent smoking (parental smoking and smoking by other household members) were most likely to be found in lone parent and stepparent families. SALSUS (2018) found that among regular

smokers who were age 15, 10% lived in single parent families compared with 5% who lived with both parents Scottish Government (2019a). Thus, Holliday (2006) concludes that,

*'In general, intact two-parent families are protective against smoking.'*

(Holliday, 2006). p. 28.

This assertion is backed up further by Chen et al., (2014) whose analysis of the influence of social structure and social capital on adolescent smoking found that students with parents who were married or living together had more family social capital which is a protective factor against smoking.

Third, is parental attitude to smoking with studies suggesting that parents who have a negative attitude towards smoking are protective factors against smoking in adolescents. Whereas, parents who were indifferent to their child smoking or not may increase the likelihood of smoking in adolescence (Distefan et al., 1998, Conrad et al., 1992). For example, data from the 2013 SALSUS survey found that young people who were regular smokers with a parent who smoked were more likely to be allowed to smoke than regular smokers whose parents did not smoke (52% compared with 22%) (Scottish Government, 2014, p. 31).

Last is parenting behaviour. Parents who are involved, supportive, know their child's friendship network and have a good attachment with their child are found to be protective factors against adolescent smoking (Distefan et al., 1998, Conrad et al., 1992). For example, SALSUS 2013 found that regular smokers in comparison with non-smokers were more likely to report that their parents did not know how they spent their money (19% compared with 4% for mothers and 39% compared with 15% for fathers) or where they went at night (20% compared 5% for mothers and 40% compared with 14% for fathers, Scottish Government, 2014, p. 38). Thus, positive parental role modelling and influence is of paramount importance for developing young people's attitudes and behaviour in relation to smoking, however so too is that of their peers.

#### **2.4.5 Peer influence**

The importance of peer influence in shaping adolescent attitudes, beliefs and behaviour towards smoking is widely acknowledged, with Hoffman et al., (2006) noting that several reviews, cross-sectional and longitudinal studies have shown a clear link between peer influence and smoking in young people, and concluded that:

*The association between peer influence and adolescent smoking has been documented for over 25 years. (Hoffman et al., 2006, p. 103).*

However, there is a degree of ambiguity around what the term 'peer influence' means. For example, Amos et al's., (2009) review of young people and smoking in England highlighted the importance of friends and peer group on adolescent tobacco use. They identified seven qualitative studies, who framed peer influence as 'peer pressure' - i.e., coercion or bullying to smoke. They further noted that 17 studies highlighted the importance of coercion with adolescent smokers coercing non-smoking peers to smoke Amos et al., (2009). However, they also observed that there were just as many studies (18 cited in the review) who contradicted this perspective and instead highlighted that young people were able to decline cigarette offers from their smoking peers.

Thus, understanding the role of 'peer influence' is more complex than simply labelling it as direct 'peer pressure' to smoke, with Amos et al., (2009) highlighting the importance of exposure to smoking and social norms – i.e., the belief that everyone is smoking, when this is often not the case.

Social network analysis (SNA) scholars also argue that the role of peer influence needs to be considered from a broader perspective and have criticised the existing evidence base for failing to consider two importance dimensions: 1) the combined role of peer influence and peer selection and; 2) the composition of adolescent networks (i.e., network structure). This is important because there is a growing evidence to show that both are significant predictors of adolescent smoking behaviour (Choi and Smith, 2013, Seo and Huang, 2012, Ennett et al., 2008, Mercken et al., 2012, Mercken et al., 2009). The focus of this section of the literature review is, therefore, to review the SNA literature on adolescent smoking to: 1) disentangle the importance of friendship selection and friendship influence and; 2) examine the significance of where an adolescent sits within their social network – i.e., does it matter if they have lots of friends, a few friends or no friends?

#### *2.4.5.1 Friendship selection and friendship influence*

Several studies have noted similar smoking behaviour amongst friends (Mercken et al., 2012, Ragan, 2016, Derzon and Lipsey, 1999) but there is debate about why this is so. On the one hand there is a body of literature, as noted above, that points to the importance of peer

influence. For example, peer pressure, social norms, desire to be popular, coercion - smokers encouraging non-smokers to smoke, (Aloise-Young et al., 1994, Lakon and Hipp, 2014, Lakon et al., 2015, Winther et al., 2014); whereas others claim that peer selection – where adolescents select friends with similar smoking behaviour to them - is equally, if not more, important (Ennett et al., 1994, Fisher and Bauman, 1988, Hall and Valente, 2007, Pearson et al., 2006, de Vries et al., 2006, Ennett et al., 2008).

However, as Hall and Valente (2007) note, adolescents tend to select friends based on shared interests and activities but, the friends they select will influence their behaviour (Hall and Valente, 2007). Thus, it is plausible that adolescent smoking behaviour is a consequence of both peer selection and peer influence (Kirke, 2004, Hoffman et al., 2007, Mercken et al., 2009, Steglich et al., 2012). For example, Lorant et al., (2017) sought to further understand smoking inequalities in adolescents. Their results showed that students of lower SES were more likely to be regular smokers than students of higher SES. Less affluent students were also more likely to have a higher exposure to friends who smoked, with one quarter of their friends smoking in comparison with one sixth of the most affluent students. They concluded that adolescent smoking behaviour was ‘substantially related’ to the smoking behaviour of their friends. However, they could not distinguish between the importance of peer selection or peer influence,

*Two pathways could explain why adolescent smoking behaviour is substantially related to friends’ smoking behaviour: either adolescents make friends with other smoking peers because they have a personal vulnerability to smoking (e.g., when their parents smoke) or they take up the behaviour of their existing peers. The first pathway is known as selection, whilst the second is labelled peer influence. Our cross-sectional design makes it difficult to disentangle the two and that is beyond the scope of this paper.*

(Lorant et al., 2017, p. 60.)

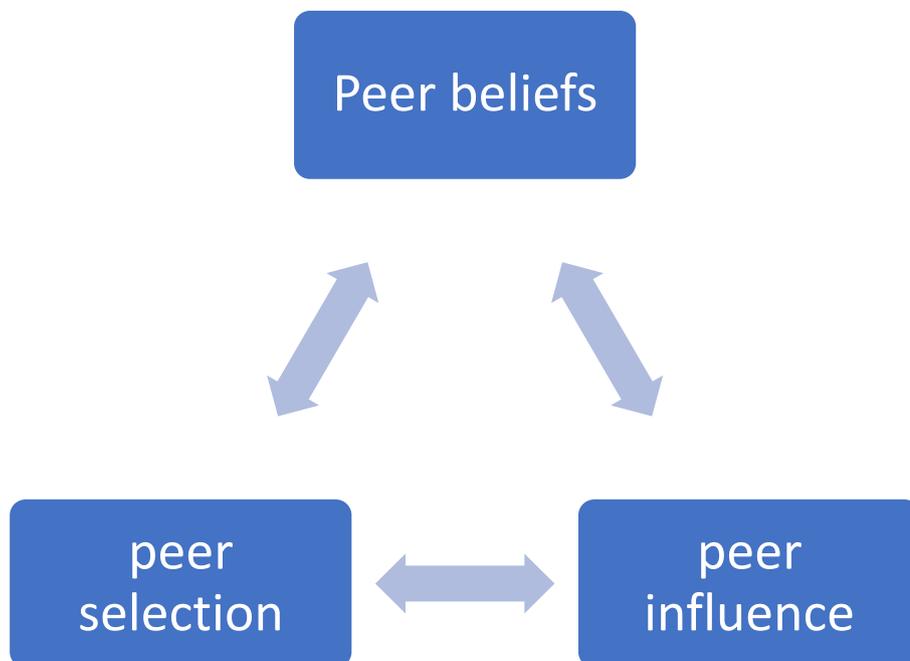
It is not surprising then, that Mercken et al., (2012) have also observed that disentangling the two is challenging. However, they also note that to aid the design of adolescent smoking prevention programmes, attempts should be made to understand them independently,

*Smoking prevention programs should not solely focus on social influence processes, but also consider peer selection processes.*

(Mercken et al., 2009, p. 80.)

Ragan (2016) adds a further dimension and encourages us to consider the role of peer beliefs. He is critical of the SNA literature examining peer selection and peer influence on adolescent smoking and argues that it presents an incomplete picture by not considering the contribution of peer beliefs. Using SNA to generate a greater understanding of the ways that peer belief contributed to adolescent smoking he concluded that peer beliefs were influenced by friendships, which in turn influences peer selection, which will then influence the beliefs. This highlights the complexity of trying to disentangle peer influence, peer selection and peer belief, and adds weight to Hall and Valente's (2007) arguments (and others Kirke (2004), Hoffman et al., (2007) that they are interconnected, as I have attempted to illustrate in Figure 2.9.

**Figure 2.9: The combined influence of peer belief, peer influence and peer selection on adolescent smoking behaviour**



Thus, it would seem that considering peer influence and peer selection without considering peer beliefs results in an incomplete understanding, which could be detrimental to adolescent smoking prevention programmes. ASSIST is, therefore, unique because it takes cognizance of these three elements - it uses network intervention approaches (discussed in 4.4.2) to identify influential students and then trains them to challenge their own and peer smoking beliefs which has the potential to influence peer selection.

#### 2.4.5.2 *Typology of adolescent smokers: isolates, liaisons and cliques*

Having examined the importance of peer section, peer influence and peer belief, this section will focus on understanding more about the composition of adolescent smoking networks i.e., what do the networks of adolescent smokers look like? This is important because understanding what these networks look like could help to direct future smoking prevention programmes and policy by identifying which of groups of adolescents are most at risk.

The SNA literature on the composition of adolescent smoking networks identifies three main typologies: 'isolates', 'cliques' and 'liaisons'. In its purest terminology an isolate has no connections to other people in a network, thus has little or no interaction with their peers. Cliques (also referred to as 'members') would be clusters of adolescents who share similar attitudes and beliefs, spending more time with one another than other adolescents. In contrast, the networks of liaisons are more diverse, interacting with a wider group of peers and, therefore, exposed to different attitudes and beliefs (Choi and Smith, 2013).

Seminal early work in this area conducted by Ennet and Bauman (1993) found that isolates were the group most at risk of being smokers. Using SNA they investigated whether adolescent smoking prevalence varied by peer group structure. They hypothesized that if adolescent smoking behaviour was linked to peer group structure then cliques should be at a higher risk of smoking than non-clique members. Survey data, completed via a self-complete home survey, was collected from students aged 14-15 with a sample range of between 165 and 292 students. Students were asked to name and rank their three best friends. They allocated students to one of three groups: clique member; liaison; and isolate. Their hypothesis was not proven, with isolates more likely to be current smokers than clique members or liaisons. The range of cliques who smoked across the five schools was 3.9% to 15.5%, whereas the range was nearly five time higher in isolates – 16.7% to 38.5%. They noted that their finding was in contrast to the,

*prevailing belief that cigarette smoking is a peer group phenomenon.*

(Ennett and Bauman, 1993, p.234.)

Similar findings have been found from other studies who identified isolates as those most at risk of becoming smokers. For example, Pearson and Mitchell (2000) used SNA to explore smoking and drug taking behaviour amongst a group of adolescents aged 12 -14 in Scotland. They also concluded that isolates were more inclined to take part in risk taking behaviour than the other two groups (who they labelled as members and peripherals i.e., liaisons). For

example, the percentage of regular smokers (classified as isolates) at time point one was 11.1%, by time point two (one year later) it had increased to 33.3%. Comparable figures for members were 17.1% and 22.9% with a decline for peripherals from 17.1% to 11.6%.

Ennett and Bauman (1993) offer three key theories to explain why isolates were the group most at risk of smoking. First was social isolation, which may trigger boredom or stress which, in turn, may trigger smoking onset. Second was social exclusion (which leads to social isolation) where a peer group may expel and bar someone from entering if they become a smoker. Thus, they may have been in a different peer group e.g., a clique or liaison but became an isolate due to being shunned because of their smoking behaviour. Again, this ties in with earlier discussion around peer selection where adolescents select people similar to themselves (homophily). Last, they suggest that students classified as isolates could be members of cliques or liaisons with networks outside of school. However, they also note that students were not restricted to nominating alters from their own school, and that 95% of friendship nominations were for alters attending the same school.

There are two main criticisms of the Ennett & Bauman (1993) and Pearson & Michell (2000) studies. First, there is no inclusion of gender in the analysis to assess whether the structural position in a network varies by gender. Second, is the age of the data. Data were collected for the Ennett and Bauman (1993) study 40 years ago in 1980 and over 20 years ago (1995) for the Pearson and Michell (2000) study. However, more recent work by Choi and Smith (2013) also found that isolates remained a key risk factor for adolescent smoking. They conducted a meta-analysis (combing existing studies to produce larger samples) of existing studies (year of publication ranging from 1995-2008) to examine the relationship between smoking behaviour and network position. By combining findings from existing studies they set out to answer two research questions: 1) What is the relationship between an adolescent's position in their social network (i.e., members, liaisons or isolates) and smoking behaviour and; 2) Does the association between smoking behaviour and social position change over time? A search strategy was described, but the search terms were limited and the inclusion criteria vague. For example, there was no description of how smoking status was measured. In addition, the age criterion was '18 years or younger'. This means that we do not know what the age range of the included studies were (this is important because as discussed previously (section 2.4.1) age is a key factor in adolescent smoking careers). However, despite these limitations, the sample was large with 5,067 participants and their analysis found that the odds of smoking were 1.5 times higher (95% CI = 1.32, 1.81) for isolates than clique members or liaisons. This consolidates previous findings that an adolescent's position in their social network is related to their smoking behaviour.

The authors also concluded that, by comparing the odds ratios from the included studies by year of publication, the odds of isolates smoking in comparison to members (cliques) and liaisons decreased over time. Given that adolescent smoking prevalence rates increase through adolescence (Scottish Government, 2019a, Amos et al., 2009, Benjamin, 2012) this finding is unusual as we would expect it to increase over time in line with the general prevalence figure. Choi and Smith (2013), speculate that this could be a result of smoking restrictions (introduced through tobacco control policy), with smokers required to smoke in designated outdoor areas. This could mean that isolates were coming into contact with other smokers, forming new bonds and therefore changing their network position from isolate to liaison or clique. They argue that their findings have two implications. First, it calls into question the strength of peer influence as a key factor to explain adolescent smoking behaviour - if friends were so important we would expect to see higher odds of smoking in the members and liaison groups, not isolates. The authors note that further research is required to understand why the odds of smoking is higher in isolates, with siblings posited as one theory – i.e., isolates maybe influenced by their siblings' smoking behaviour.

Further support for the importance of isolates when considering peer group structure and smoking evidence comes from a systematic review of studies examining peer group structure (i.e., clique members, liaisons or isolate) and its influence on smoking behaviours (Seo and Huang, 2012). The authors searched for articles over a 15-year period (1985 – 2010) and 10 met the criteria for full review. Six of these studies specifically looked at the relationship between peer group structure and adolescent smoking behaviour. All of these studies consistently identified isolates as a risk group, with the odds ratios of smoking amongst isolates in comparison with cliques ranging from 1.19 to 5.49. They concluded that,

*Isolates were not only more likely to smoke on a daily basis but also be more likely to be current smokers than either clique members or liaisons.*

(Seo and Huang, 2012, p. 23.)

However, Pearson et al., (2006) and others (Turner et al., 2006, Amos, 2009, Lorant et al., 2017) suggest that the importance attributed to isolates may be too simplistic, with various contextual factors, such as the subtleties between peer influence, selection and beliefs discussed in 2.4.5 and the role of gender and inequalities, at play. For example, Pearson et al.,(2006) sought to explore whether network structure influenced smoking behaviour and collected survey data from nine secondary schools in Glasgow, Scotland in 2001. Participants

were aged between 13 -15 and data were collected to measure three things: sociometric position (group, dyad, isolate); popularity (i.e., number of friendship nominations received) and expansiveness (number of nominations made) by gender, SES and age. Their findings concur with the existing evidence base – that isolates had the highest smoking prevalence, but this was only true for students who attended schools in deprived areas. Smoking rates were higher amongst the most popular students in schools in less deprived areas.

## 2.5 Summary

The aim of this first literature review chapter was to establish a platform for the thesis by developing a greater understanding of adolescent smoking behaviour and the factors that influence it. The chapter started with a review of data sources for adolescent smoking in Scotland, highlighting the limitations of these data and the measures used to classify adolescent smoking behaviour. This included inconsistencies in the measurement of smoking status between different countries and the importance of recording both regular and occasional smoking.

The review of the Scottish adolescent smoking prevalence and trends data highlighted five key points. First, Scottish adolescent smoking rates remains low and are in line with the rest of the UK. However, despite a continued decline in smoking initiation, the rate of decline in Scotland appears to have slowed in comparison with other devolved nations and countries taking part HBSC countries. *Second*, adolescent smoking increases with age. Quantitative data sources have consistently shown that adolescent smoking prevalence increases between the ages of 13 and 15. This is why smoking prevention interventions like ASSIST target secondary school students aged 11-13 years to try and prevent or delay the onset of smoking experimentation for as long as possible. *Third*, the gendered pattern of smoking behaviour has narrowed in recent years. *Fourth*, the decline in occasional smoking is more modest than regular smoking. *Fifth*, regular smoking among adolescents continues to be significantly higher in the most deprived areas.

Once these data had been considered, explanation was sought to further understand the patterns and trends in adolescent smoking that had been identified through the review of existing data sources. This comprised a review of existing models attempting to describe the different stages of adolescent smoking behaviour. It concluded that despite these models helping to conceptualise smoking behaviour, they can be criticised for being too linear in focus, with traditional categories of smoking behaviour (such as regular, occasional non-smoker)

incongruent with how young people see themselves. Consequently, they do not take account of the more nuanced and fluid nature of adolescent smoking behaviour.

This chapter also reviewed the key factors associated with adolescent smoking and concluded that there is no single reason to explain why adolescents start to smoke and progress to regular smoking, with several factors at play. However, age, gender, socio-economic inequalities, family and peer influence were identified as key factors. Of particular importance was the role of peer and social network influence, which is central to this thesis. Drawing on the social network analysis and adolescent smoking literature I considered the complexity of peer influence, taking into account the importance of peer selection, peer belief and social network structure.

A limitation of this literature review is that the evidence, despite being extensive, is dated. For example, in Mayhew et al., (2000) called for further research to explore the amount of time young people spend in each the stages of his theory of adolescent smoking behaviour development. This literature review did not identify any studies that filled this gap in the evidence base. In addition, the existing qualitative work exploring the influence of gender and adolescent smoking is c15-20 years old.

Despite this, Chapter Two achieved its objective which was to provide a platform for the thesis to help guide research design and inform analysis. For example, it highlighted the importance of considering the role of gender in my analysis - e.g., whether peer supporters were more likely to speak to women or men and if this varied by the gender of the peer supporter. It also added context to explain the limited extent of message diffusion within the peer supporter's school year discussed in Chapter Seven (i.e., as fewer adolescents are smoking it may have been harder for peer supporters to identify peers in their school year to speak and to also initiate a smoking conversation with). The implications of this and recommendations for ASSIST (and any interventions using a similar approach) are discussed in Chapter Nine.

Having started with a broad overview of adolescent smoking behaviour and influencing factors, Chapter Three will now present findings from my systematic review of the barriers and facilitators to delivering school-based interventions, which informed the overall aim and research questions for this thesis.

# **Chapter 3: A systematic review examining the facilitators and barriers to the delivery of school-based smoking prevention interventions for children and young people**

## **3.1 Introduction**

The previous literature review was deliberately broad in order to set the thesis in context by reviewing data sources for Scottish adolescent smoking and presenting key findings in relation to adolescent smoking prevalence, consumption and influencing factors. This chapter will be narrower in focus and examine the barriers and facilitators to delivering smoking prevention programmes in schools. Previous systematic reviews of school-based smoking prevention programmes have found mixed results regarding effectiveness and have tended to exclude qualitative studies (unless they are part of a process evaluation running alongside the RCT) (Flay, 2009, Thomas et al., 2013a, Wiehe et al., 2005). This is due to their focus on assessing intervention effectiveness which qualitative research cannot answer. There is, therefore, a lack of qualitative systematic review evidence looking at the barriers and facilitators to delivering school-based smoking prevention interventions from qualitative studies. Such studies can highlight important learning and generate deeper insight into the factors that contribute to the success or failure of school-based smoking prevention programmes, such as ASSIST. By updating an existing systematic review, conducted by Bauld et al., (2009) this chapter will contribute to this evidence gap. It will also help to shape the overall aim of the thesis by highlighting a lack of research exploring the extent of (or potential for) message diffusion beyond the school environment.

This chapter commences with a brief introduction to conducting a qualitative systematic review and then provides a summary and critique of the barriers and facilitators identified from the 2009 review. Next, the focus moves onto the methodology employed in this review, then results are presented and concludes with a summary of the key findings and limitations of the review. Various documents are appended that add further detail on the process of the review (Appendix 3 – Systematic review search strategy, Appendix 4 – Websites of key organisations to identify grey literature, Appendix 5 – Sifting checklist, Appendix 6 - Study quality ratings)

## **3.2 Systematic reviews: definitions and development**

Systematic reviews are a hugely valuable resource for health care providers, policy makers and researchers who have limited time to wade through 'unmanageable amounts of information' (Murlow 2014, Cynthia, 1994). Their main purpose is to review, appraise and integrate the existing literature to provide reliable and accurate findings to inform evidence-based decision making (Petticrew and Roberts 2006). Petticrew (2003) places the first specific use of the term 'systematic review' around the 1930s, suggesting that it is not a new method. However, Gough et al (2012) argue that it was not until the late 20th century (1980s) that systematic reviews became 'a major area of methodological development.' In the UK, the use of systematic reviews in public health gained further traction via the establishment of UK Cochrane Centre in 1993 and the NHS Centre for Reviews and Dissemination in 1994. Both centres have a specific remit to conduct systematic reviews that focus on the effects of health care interventions.

### **3.2.1 Qualitative Systematic Reviews**

Traditional approaches to conducting a systematic review tend to be quantitative in focus, often excluding qualitative studies due to their lack of generalizability to the wider population. This is illustrated by Petticrew (2005) and Popay (2010) who describes the 'hierarchy of evidence' which is often used by health researchers to describe the selection process for study design, which are eligible for inclusion. At the top of the list are studies that employ a Randomized Controlled Trial (RCT) design, with qualitative studies ranked near the bottom of the hierarchy (Petticrew and Roberts, 2003). However, Petticrew and Roberts (2003) also note that the term 'hierarchy' is contentious especially in the field of public health and health promotion. This is primarily because the term was constructed to aid decision making for clinical questions (i.e., effectiveness of treatments). The hierarchy was not designed for reviews that seek to answer questions around process (i.e., how acceptable an intervention was and how it was delivered). Because of this they argue that a more useful approach to conducting a systematic review is to think of 'typologies' of evidence rather than 'hierarchies'- i.e what type of evidence is best placed to answer the research question of interest? Systematic reviews of qualitative studies can, therefore, add valuable insight into how and why interventions are successful or unsuccessful. For example, as noted by Noyes et al., (2018) synthesising evidenced from qualitative data can aid our understanding for intervention design and implementation (i.e., factors that aid or hinder delivery of an intervention and could be adapted for future delivery). This includes factors that are external to the intervention itself,

e.g., policy development. It can also aid the delivery of healthcare systems – e.g., what are the barriers and facilitators to accessing healthcare.

As illustrated by Tong et al, (2012) the number of published syntheses of qualitative health studies is on the increase, rising from 1 in 2001 to 89 in 2010. In the late 1990s the Cochrane Qualitative and Implementation Methods Group was established to develop methodological guidance and offer advice and training on qualitative evidence synthesis. Since then, methods for qualitative synthesis have evolved considerably, with over 30 different methods for conducting evidence synthesis from qualitative reviews (e.g., Meta-ethnography; Grounded theory; Thematic Synthesis; Realist Synthesis; Textual Narrative Synthesis; Critical Interpretive Synthesis; Ecological Triangulation) (Thomas and Barnett-Page, 2009, Thomas, 2012, Noyes et al., 2018).

However, Higgins et al, 2012 note that the lack of evaluation to assess the strengths and weakness of each synthesis approach and conclude that the approach to data syntheses will depend on the review questions, expertise within the team and available resources. Generally, the most popular method is thematic synthesis, which uses thematic coding to summarise findings from included studies (Thomas, 2012). These codes can be pre-specified (deductive) or built up from the extracted data (inductively). Thomas and Newman (2009) note that this flexibility enables synthesis of multiple studies across the positivist and interpretive research paradigms, which may explain its popularity. Popay et al (2010), however, note that a lack of transparency often exists in reporting how themes were created. This can be mitigated by authors being as transparent and detailed as possible about how the themes were generated.

### **3.2.2 Critical appraisal in qualitative systematic reviews**

Assessment of study rigor and quality is an accepted requirement in quantitative systematic reviews, to reduce reporting bias. However, several authors note that quality assessment using 'formal' checklists (of which there are over 100, few of which have been evaluated) is a contentious issue for qualitative systematic reviews with debate around their applicability and value (Dixon-Woods et al., 2006, Dixon-Woods et al., 2005, Popay, 2010, Higgins, 2011). There are two main reasons for this. First, assessing quality is more complex for qualitative studies than quantitative studies. For example, studies deemed of poor quality due to weak methods may offer new insight/understanding using robust analysis and interpretation. Likewise, studies that score highly for design, method and sample may present weak

descriptive analysis, lacking interpretation of findings. Second, checklists are criticized for failing to distinguish between different study designs or theoretical approaches and imposing,

*A dominant view of what 'good' qualitative research should be like*

(Dixon-Woods et al., 2006. p 9.)

Nonetheless, some assessment of quality is required to give some degree of confidence in the findings extracted. Further discussion of the approach used in this systematic review is presented in 3.4.5.

### **3.3 Summary and critique of the 2009 systematic review**

In February 2010, the National Institute for Health and Care Excellence (NICE) published guidance on school-based interventions to prevent smoking. To inform this guidance NICE identified an evidence gap from qualitative studies and commissioned a team of researchers to conduct a systematic review of qualitative research published in 1990-2008 (Bauld et al., 2009). The aim of this review was to examine the facilitators and barriers to the successful delivery of school-based interventions to prevent the uptake of smoking. The review identified 21 papers that matched the inclusion criteria and were included for full review. Key themes and issues from the included studies were extracted and used to create evidence tables. Once evidence tables were created the study team synthesised the extracted data into six themes. Each theme was presented independently using a clear and structured descriptive approach. While this was easy for the reader to digest and highly suited for a research findings report (as requested by the funder), it lacked interpretation i.e., what do the findings mean in the context of developing and evaluating school-based interventions to prevent smoking? Thus, below I will attempt to summarise the six themes from the 2009 review but also offer some interpretation in terms of how they can aid the design and delivery of school-based interventions to prevent adolescent smoking. This familiarisation with the existing themes and the further interpretation will form the foundation for analysis of the studies added from my 2009-2014<sup>1</sup> update of the existing review.

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<sup>1</sup> Note conducting the systematic review was one of my first tasks when I started my PhD in May 2014, the search was conducted in December 2014 and was not updated due to time restraints. This is acknowledged as a limitation in Chapter Nine.

### **3.3.1 Delivery context of the intervention**

This theme looked at the factors associated with delivery of school-based smoking prevention interventions. Authors of the 2009 review noted the importance of timing in relation to: 1) delivering the intervention at a time that suited the school's curriculum; 2) intervention delivery over several sessions in the school year; 3) careful consideration of what school year to target. The authors used the example of ASSIST, which targets delivery to year 8 (S2 in Scotland). They referred to Audrey et al's (2008) study, which noted that this year offered more flexibility in terms of curriculum, with fewer exams which made it easier for students to be taken out of class to attend the two-day training and subsequent follow-up sessions. This suggests that meaningful dialogue with the schools is essential when planning delivery of a school-based interventions to ensure successful participation. Related to this was a further recommendation to facilitate successful delivery, which was engagement with key partners to develop the intervention (i.e., not just deliver it). The only barrier identified under this theme was school team members who were seen smoking on school premises.

### **3.3.2 Characteristics of young people**

This theme was concerned with the attitudes, beliefs and smoking behaviour of the young people the intervention was targeting and how they could be a barrier to intervention delivery. For example, intervention delivery was more challenging when delivered in schools with higher smoking prevalence. Authors of the 2009 review did not elaborate on why this was, but from reading the study summaries it may be associated with greater exposure to smoking within their social networks. This exposure contributes to smoking being normalised and seen as an acceptable activity. For example, the review authors noted the importance of other smokers in young peoples' households and local communities (i.e., their social networks) and flagged this as a potential barrier to implementation effectiveness. They presented findings from one study where a child smoker reported that they found it hard to stop smoking because their parent and siblings were also smokers (Cole, 2000). This suggests that the effectiveness of school-based interventions could be diluted if the adolescent's social network included smokers.

The importance of age was also acknowledged - with older adolescents less receptive to smoking prevention messages than younger adolescents. This adds further strength to the argument that school-based, smoking prevention interventions should be targeting younger adolescents, (which, as noted in Chapter Two, is why ASSIST targets 12-13 year olds). It also

suggests that when targeting schools with higher smoking prevalence a greater level of resource and planning may be required to support intervention delivery (i.e., more time to build relationships with schools to anticipate challenges to engagement and identify strategies to try and mitigate them).

### **3.3.3 Peer interventions**

The 2009 review found that involving young people in the delivery of interventions to address peer smoking norms could help to facilitate successful implementation of school-based prevention. Key elements were: students' nomination of peers to deliver the intervention; training of peers to take place away from school by externally trained staff (i.e., not school staff); building flexibility into intervention delivery to allow peer deliverers to adapt their delivery styles as appropriate; enhancing the value of the intervention by including other presentation materials such as video; and finally ensuring good communication between the intervention deliverers and the school team. Two barriers were discussed: 1) school staff concerns regarding the suitability of some students selected to deliver peer intervention; and 2) the success of peer delivered interventions will depend on the size of peer social networks, as well as the receptiveness of fellow students to listen to prevention message.

### **3.3.4 Delivery mechanisms**

Delivery mechanisms focused on intervention delivery, specifically who delivered the intervention and when it was delivered. Facilitators included: delivery by an external professional, or by teachers who do not smoke and/or have high self-efficacy (because they were more likely to deliver the intervention as intended); involving parents by reinforcing messages at home using supporting material. In contrast the 2009 review found that barriers to delivery were teachers who were reluctant to discuss parental smoking and used dated communication methods (no detail is given regarding what communication methods are out dated). The purpose of this theme appears to be very similar to the first theme – *delivery context of the intervention*.

### **3.3.5 Smoke-free schools**

The review found that enforcement of smoke-free school policies served as both a facilitator and barrier to the delivery of smoking prevention programmes. For example, policies that applied to staff and students were more successful than those allowing staff to smoke in

designated areas. Not surprisingly, policies that were poorly enforced were found to be a barrier to successful intervention delivery. Within this theme there was no discussion of what a smoke-free policy actually was – i.e., the components it should cover. For example, guidance created by NHS Greater Glasgow and Clyde and ASH Scotland (2015), emphasised the important role that the school environment has on the choices young people make and called for this to be acknowledged in their smoke-free policies by creating a guidance document that,

*aims to encourage and support schools to extend their tobacco policies beyond simply stating where people can and cannot smoke and to more formally recognise the role of schools as health educators and positive life choice influencers by becoming a Tobacco-Free School' (NHSGG, 2015, p. 8.)*

### **3.3.6 Programme content**

The review authors concluded that successful elements of intervention programme content were: innovative and interactive (e.g., role play); challenged social norms (i.e., the misperception of high smoking prevalence amongst adolescents); culturally and ethically sensitive and non-judgemental. Programme content that was overly complex and instigated fear was less successful. In light of this, it is not surprising that peer led, innovative, social network interventions like ASSIST are considered more effective than traditional school-based, teacher lead smoking prevention programmes. (Campbell et al., 2008b, Brown et al., 2014a, Thomas et al., 2013a).

## **3.4 2014 update review aim and research questions**

In 2013 an update to the NICE guidance on delivery of school-based interventions to prevent smoking was published (NICE, 2013). The update identified new studies and reviews, but it was not a systematic review of qualitative studies. A subsequent review (Brown et al, 2014) of smoking interventions for young people used more inclusive criteria, including both qualitative and quantitative studies, however it had a specific focus on the equity impact of interventions, and only included studies reporting smoking-related outcomes for two or more socioeconomic groups. My systematic review (conducted in 2014) will, therefore, serve as an update to the existing 2009 review (Bauld et al., 2009) searching for qualitative data from any new school-based programmes.

With this in mind, the aim of the review update was to explore the facilitators and barriers to delivery of school-based interventions to prevent smoking uptake in children and young people. In line with the research questions for the 2009 review, my systematic review addressed the following two research questions:

1. What factors aid the delivery of school-based interventions to prevent the uptake of smoking?
2. What are the barriers to the delivery of school-based interventions to prevent the uptake of smoking?

### **3.4.1 Methods**

A protocol was designed using the PRISMA-P guidelines for systematic review protocol development. This was registered with PROSPERO (CRD: 42014015483) an international registry of systematic reviews specifically concerned with health outcome. The aim of registering the protocol is to avoid unnecessary duplication and reporting bias. The protocol was also published in *Systematic Reviews*, an online-only open-access peer-reviewed journal concerned with the design, delivery and reporting of systematic reviews (Dobbie et al., 2018).

### **3.4.2 Search Strategy**

The search period was from January 2009 to December 2014 and included three elements. First, in order to build on findings from the 2009 review, the same electronic databases consulted in 2009 were searched: Cochrane Library, MEDLINE, EMBASE, PsycINFO, HMIC, ERIC, ASSIA, Web of Science and CINAHL. The search terms (example found in Appendix 3) also replicated the search strategy used in the original review with subject headings relating to smoking, children and young people, health promotion, and school. As do the inclusion and exclusion criteria in Table 3.1. Second, retrospective reference checking of a sample of systematic reviews and articles (e.g., by most recent publication type) was conducted. Finally, website searching (using pre specified search terms) of key organisation and stakeholder groups (see Appendix 4) was conducted to identify any unpublished literature.

### **3.4.3 Inclusion / exclusion criteria**

The PICO format (Higgins, 2011), Table 3.1, was used to define the search strategy, to which S (setting), T (type of study) and P (type of publication) were added.

**Table 3.1: PICO(STP) criteria**

Participants/ population	Any young person attending primary or secondary school in a country of origin within the OECD (Organisation for Economic Co-operation and Development).
Intervention(s), exposure(s)	Any type of school-based smoking prevention intervention or programme. This could focus solely on smoking prevention or be included as part of a risk prevention programme (e.g., drugs, alcohol, sexual health). Only findings related to tobacco smoking were included, marijuana smoking and electronic cigarettes were excluded.
Comparator(s)/ control All types of primary and secondary schools (e.g., state, public, special education, young offenders and faith schools) were included.	Not applicable.
Outcomes	To explore the facilitators and barriers to the delivery of school-based interventions to prevent smoking uptake in children.
Setting	All types of primary and secondary schools (e.g., state, public, special education, young offenders and faith schools) were included.
Types of study to be included	Qualitative studies only. This included mixed method studies where qualitative and quantitative research had been used. Pure quantitative studies or RCTs were excluded (unless they had a process evaluation which included a qualitative element).
Publication characteristics	Systematic reviews (for reference checking only), journal articles and grey literature published in English between January 2009 and December 2014 were eligible for review. Conference abstracts were excluded due to a lack of data, although a search was made for a full-text paper.

#### **3.4.4 Data management**

Once the search terms were piloted and finalised, electronic databases were searched and references exported to RefWorks (ProQuest LLC) bibliographic software for storage and removal of duplicates. After removing duplicates, title and abstracts were reviewed to identify relevant studies using a pre-defined checklist (Appendix 5). I conducted this review and a double review of all references was conducted by Karen Allum (KAI). Full papers were retrieved for studies deemed potentially relevant. Double-screening of full papers was conducted by myself and KAI and those deemed irrelevant were removed. Where we disagreed, a third reviewer Kathryn Angus (KAN) screened the full paper for inclusion or exclusion. This generated a final list of studies for full review. At this stage the other elements of the search method were conducted (website review and reference mining).

#### **3.4.5 Quality assessment**

All studies that meet the inclusion criteria for full review were independently reviewed by myself and KAI. In line with the previous review, the critical appraisal checklist developed by NICE for qualitative studies was used to review the selected articles (Methley et al., 2014). This proved challenging because only two of the studies used purely qualitative methods, the rest were mixed methods, some with a very small qualitative component. However, as my focus was findings from the qualitative component, the tool was useful to enable assessment of these data. For each study the tool assessed: the theoretical approach and clarity of its aims; the rigour of the methods; how well the data collection was carried out; the relationship between the researcher and participants, and reliability of the methods; the richness of the data and rigour and reliability of the analysis and findings; and the reporting of ethical issues. An overall assessment of the study's relevance and one of three final gradings (++ , + or -) was given according to how many of the checklist criteria had been fulfilled, and if not fulfilled, whether the conclusions were likely to alter or not.

#### **3.4.6 Strategy for data synthesis**

Study findings were synthesised thematically using 'best-fit framework syntheses' (Cooper et al., 2011). This allowed for the existing set of themes from the 2009 review to be used as a starting point to map or code included studies. These themes were then adapted as data extraction took place to accommodate new emerging themes. This approach is particularly useful for updating an existing systematic review because it enables utilisation of the themes

identified in the previous systematic review (Bauld et al ., 2009). It is also an efficient and pragmatic approach to coding when timescales are limited (Cooper et al., 2011).

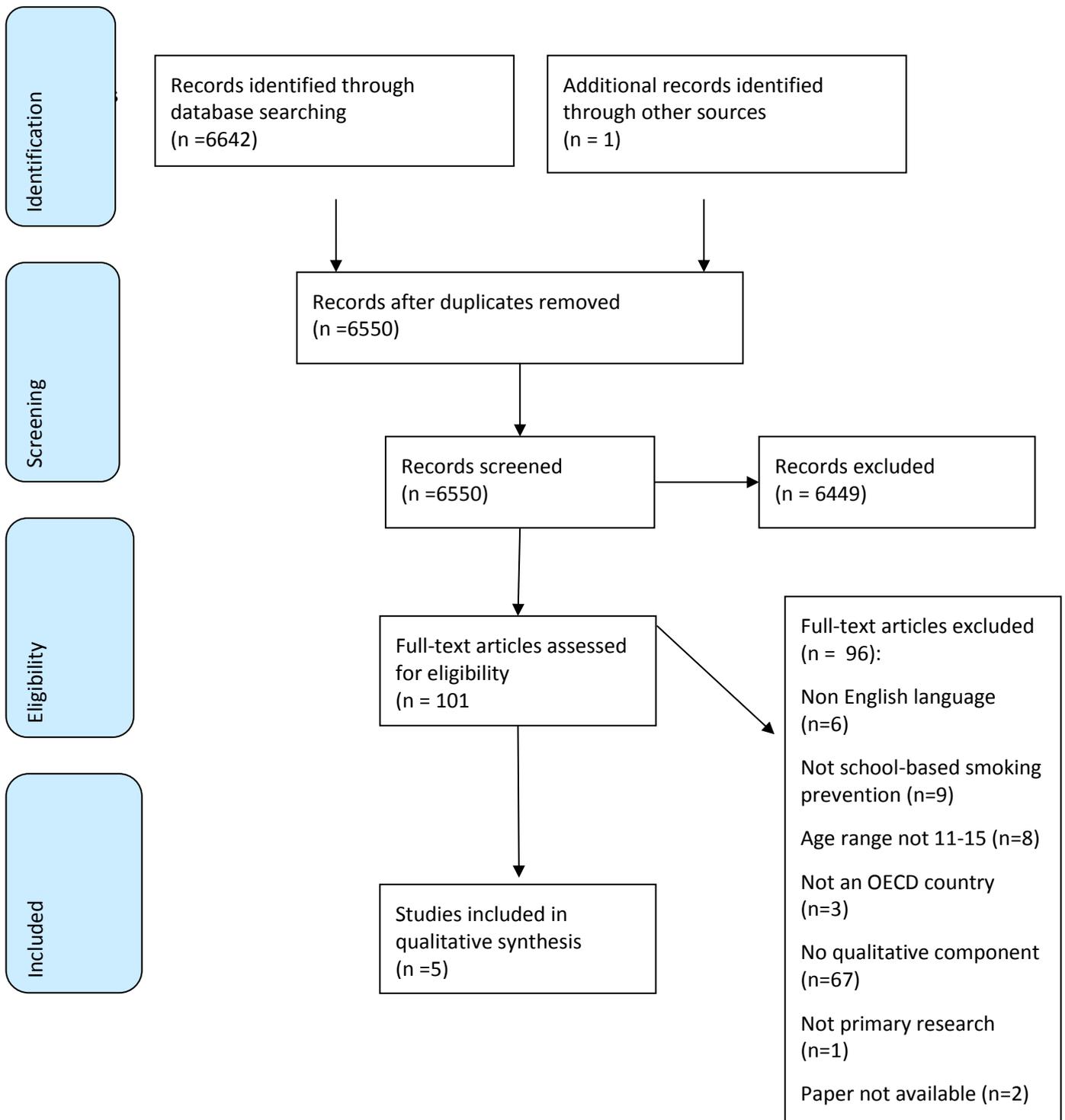
## **3.5 Results**

Results from the 2014 review update are presented in three parts. Part one describes results from the search strategy discussed in paragraph 3.2. To give the reader a sense of the papers selected for full review part two presents a general summary of aim, design and quality rating. Finally, part three presents findings from the 'best-fit' synthesis structured around four themes: 1) delivery approach; 2) programme content; 3) school support; and 4) characteristics of young people and their social networks.

### **3.5.1 Results from search strategy**

A total of 6,550 publications were identified after de-duplication (see Figure 3.1). After title and abstract review, a further 6,449 publications were removed, due to them not meeting the inclusion criteria set out in section 3.4.3) resulting in 101 for full text review of which five were eligible for analysis. The grey literature search was unproductive with just one highly relevant unpublished report found via consultation with a colleague. Unfortunately, permission was not granted to include in the review as this would require approval from the commissioner who had since retired.

**Figure 3.1: Flow diagram of results**



### **3.5.2 General overview of papers selected**

Five papers met the inclusion criteria for full review. A summary of each paper (including a description of the intervention) is presented in Table 3.2, with an assessment of their overall aim, design and quality presented below.

#### **3.5.2.1 Study aims**

All of the studies (bar one) had a specific aim to evaluate an existing intervention (i.e., the intervention had already been developed). For one study it was not clear whether they were evaluating a pilot intervention or not (but given that it was delivered to eight classes across two schools we can assume it was pilot) (Hassandra et al., 2009); two studies were evaluating the same intervention delivered as part of an RCT across several schools (Holliday et al., 2009, Starkey et al., 2009a). One study combined findings from both the intervention development and pilot (Andersen et al., 2014b) and the remaining study (the only purely qualitative study with nine semi-structured interviews) was neither describing the development or evaluation of an intervention but focused on collecting information to inform future intervention design (Small et al., 2013). This paper was deemed suitable because participants had either developed or delivered smoking prevention interventions previously which they were asked to reflect on. It, therefore, contributed to our understanding of the barriers and facilitators to delivering school-based smoking prevention programmes, which was the purpose of this review.

#### **3.5.2.2 Study design**

Four of the five studies used mixed methods, combining quantitative (surveys) and qualitative methods (semi-structured interviews, focus groups, diary completion and observation (Andersen et al., 2014b, Hassandra et al., 2009, Holliday et al., 2009, Starkey et al., 2009a). One study was explicitly described by the authors as being qualitative in design, using semi-structured interviews (Small et al., 2013).

#### **3.5.2.3 Participants**

Due to the focus of this review being qualitative studies, the sample size for each study is of limited importance (participants are selected to represent range and diversity not to be representative of the study population). My interest, therefore, was to review detail on sample

characteristics and to assess the range and diversity amongst participants. All studies had consulted with a variety of stakeholders, indicating a good degree of sample diversity. For example, participants included: Head teacher's/school principals; teachers; project coordinators / trainers; pupils/students; parents; public health nurses; and employees of non-government organisations. Studies mainly collected data from school staff (teachers and head teachers) and students, with just one study including the views from parents (Andersen et al., 2014b, Buswell and Duncan, 2013, Hassandra et al., 2009, Small et al., 2013, Starkey et al., 2009a). None of the papers discussed sample characteristics that may have influenced sample diversity, such as gender and ethnicity, characteristics of schools e.g., located in a deprived area- although, one study did explicitly state that the intervention was delivered in two private schools only (Hassandra et al., 2009). Qualitative sample sizes were mixed (ranging from 8 to 33 participants with no discussion or justification for the achieved sample size), which may explain why these variables were not considered.

#### 3.5.2.4 *Study quality*

Study quality was assessed using the procedure set out in paragraph 3.5 with quality grading presented in Appendix 6. Two studies (Holliday et al., 2009, Small et al., 2013) were rated as high quality showing that most of the checklist criteria had been met, two (Hassandra et al., 2009, Starkey et al., 2009c) were classified as medium quality meeting some of the criteria and two (Andersen et al., 2014b, Buswell and Duncan, 2013) classified as low quality meeting very few of the checklist criteria. All studies lacked detail on analytical approach (i.e., how they analyzed the qualitative data) and ethical considerations when conducting the research. It is also important to note that although all of the studies had a qualitative component, for some this was very small indeed (Andersen et al., 2014b, Hassandra et al., 2009), meaning there was very little qualitative data that could be used.

### **3.5.3 Results from the 'best-fit' thematic synthesis**

Using the 'best-fit' approach discussed previously in section 3.4.6, study findings were synthesised thematically. This means that the starting point for analysis was to amend and update the existing themes from the 2009 review (discussed previously in section 3.3). For the 2014 update the following four themes were created: 1) delivery approach; 2) programme content; 3) school support; and 4) characteristics of young people and their social networks.

The 2009 review theme on programme content remains, but smoke-free schools has been dropped because just one study included for full review in 2014 had a smoke-free intervention component (Andersen et al., 2014b) and only three smoke-free school studies were included for the 2009 review. This is most likely explained by the smoking ban being fully in place across the UK by 2007 which completely prohibited smoking on school premises.

As noted in section 3.3 the 2009 review themes 'delivery context of the intervention' (3.2.1) and 'delivery mechanisms' (3.3.4) appeared very similar and have therefore been combined into a broader theme called 'delivery approach'. A new theme has been added specifically looking at school support.

#### *3.5.3.1 Delivery approach*

This theme was concerned with how the intervention was actually delivered (i.e., what the interventions components were, who delivered it and what was required of the schools to facilitate in delivery). Across the five studies, three separate interventions (Andersen et al., 2014b, Buswell and Duncan, 2013, Hassandra et al., 2009, Holliday et al., 2009, Starkey et al., 2009a) were described in five papers each using a different delivery approach. The X:IT study (Andersen et al., 2014b) (a Danish smoking prevention study targeting high school students aged 13-15) was developed and piloted using a multi-component approach which comprised of three elements: 1) schools sign up to be smoke-free premises; 2) parents sign smoke-free contracts and agree to engage in smoke-free discussion at home and; 3) smoking prevention is included in the school curriculum. The authors noted encouraging feedback from School Principals who reported a positive effect on students, who enjoyed participating. However, the delivery approach may have been over ambitious with some schools encountering problems fulfilling the smoke-free restrictions of the study (i.e., an entirely non-smoking school). After pilot testing, this criterion had to be relaxed to include schools that had an outdoor space for staff to smoke. The paper lacked explanation as to why this criterion was challenging to fulfil in all schools, but it could say something about the school culture or ethos where it was seen as acceptable for staff to smoke in designated areas, or perhaps it was challenging to implement a smoke free policy if staff were not prepared to leave school premises to smoke. Regardless, this study highlights two potential barriers: 1) expecting too much of schools; and 2) being over ambitious in what can be achieved.

The authors note that the X:IT study was delivered by a coordinator but there was no detail about what their specific role was or whether they were employed by the school or not. This lack of detail is important as findings from two studies (Hassandra et al., 2009, Holliday et al.,

2009) suggest that a facilitator to successful delivery was having 'specialists', who were external to the school deliver the programme (i.e., not school staff). For example, Hassandra et al., (2009) (who conducted a pilot study in two private schools in Greece to promote exercise as an alternative to smoking) reported findings from school principals, which suggested that they would have preferred external deliverers of the intervention (i.e., not school staff). Reasons for this centred on external staff having a better skill set to deliver smoking prevention messages than school staff who lacked the specialist knowledge or training. Further support for external intervention delivery comes from Holliday et al (2009), whose UK mixed method study looked at the fidelity of implementation of ASSIST programme and noted that,

*Trainers also acknowledged that different styles, expertise and experience could be complementary and allow a more rounded delivery of the intervention, especially when dealing with a range of students. (Holliday et al., 2009, p.56.)*

However, they also noted that variation in trainer background and expertise could result in different delivery styles, which could cause conflict,

*Disadvantages of this diversity were identified in trainer interviews and questionnaires, and in researcher observations. These included variations in expertise and differences in style, which on occasion caused conflict.*

(Holliday et al., 2009, p.56.)

Holliday et al's., (2009) study also highlighted the importance of venues as an intervention component. This was viewed from the context of delivering four follow-up sessions as part of the ASSIST programme which relied on school staff to secure suitable space within the school. They noted that,

*venues varied across schools and may have affected the success of the session*

(Holliday et al., 2009, p.52.)

Due to the pressure of the school timetable, competition within the school for available space was often high, which meant venues varied from classrooms, science labs, dining rooms and halls. The authors also found that the venue for the two-day ASSIST training was an important consideration, concluding that despite hotel venues being viewed as a 'treat' for students they

were not always ideally suited for outdoor spaces which was needed for the students, during break time and often required additional supervisions. They suggested that community venues (e.g., a rugby club) may be more suitable.

The final point related to the delivery approach comes from Small et al (2013), who conducted semi-structured interviews with a variety of professionals working in either tobacco control, health or education with a responsibility for smoking prevention in schools (Small et al., 2013). They concluded that adolescent smoking prevention required strong and sustained effort from three key groups; parents, schools and society. Parents were a child's greatest influence and smoking prevention education should come from them through discussion and living in non-smoking homes and vehicles. Schools have responsibility to reinforce the messages and society needs to provide a supportive environment through policy and legislation – e.g., mass media campaigns, graphic health warning on packaging. This also highlights the importance of social networks and the role they play in smoking prevention in terms of role modelling and influencing smoking attitudes and behaviour.

#### 3.5.3.2 *Programme content*

Findings related to programme content were primarily concerned with designing interventions that were flexible enough to fit in with existing school commitments and priorities to facilitate school support. For example, Holliday et al., 2009 noted the importance of tailoring the duration of intervention delivery. ASSIST trainers used a traffic light system to ensure that the core programme was delivered if any issues with time arose. They also noted that delivery of the four follow-up sessions could be challenging, with flexibility required to accommodate changes to the timetable depending on the needs of the school. This could be a barrier to maintaining student interest and motivation.

*The greatest variation in session length occurred during the follow-up sessions. The main reasons were: length of school lessons, organizational problems (for example, 'double-booked' rooms), and students arriving late. In one school, where school staff would not allow students to attend follow-up sessions during school lessons, these were conducted in 30 minutes during lunch breaks. Where time was short, trainers adapted the programme accordingly*

(Holliday et al., 2009, p.53.)

Similar viewpoints came from Hassandra et al., (2009) who noted one barrier to delivery was a lack of time to deliver the programme with an additional two or three weeks (i.e., a 12-week programme) required. They also noted the importance of message re-enforcement by way of booster session at a later date. Small et al., (2013) raised a similar point concluding that smoking prevention should be covered through a student's school career, not just an isolated time point

*Participants thought that, although more emphasis might be placed on prevention education in junior high and high school, this might be too late, as some children start smoking early. They believed that the earlier smoking prevention is introduced the better. It needs to start from day one and be "integrated" into the curriculum, throughout the grades. It should not be isolated, occasional, random presentations on the topic.* (Hassandra et al., 2009, p. 124)

The final point related to programme content was sustainability. Andersen et al's., (2014) X:IT study built in yearly study workshops for head teachers, teachers and school coordinators. The workshop aims were to share experience, discuss new ideas, problem solve and provide an overview of intervention progress. They also noted the importance of rooting the intervention in the local community and having the same study coordinator to help build capacity and facilitate implementation in other schools.

### 3.5.3.3 *School support*

One of the key facilitators to the successful delivery of any school-based intervention is support from schools. Without their 'buy-in' even the best planned and most successful interventions may fail. The 2009 review suggested that engagement with schools when planning an intervention was essential but lacked detail on what may help or hinder this. A study by Andersen et al., (2014) helps to fill this gap by adding further context to explain why schools may not be willing or able to participate. The barriers they identified have been subdivided into two categories: perceived relevance and practical barriers. Perception of relevance centred on the belief that smoking prevention was not a priority. The authors also found that some head teachers viewed smoking as irrelevant compared to the larger problems student faced. Related to this was the view that some schools believed they had few or no students who smoked and therefore viewed smoking prevention interventions as irrelevant and not a worthwhile investment of school resources, preferring instead to prioritise other health promotion activities. Practical barriers were due to schools being overloaded with work

and reluctant to impose further obligations, viewing the required contribution as too large and overwhelming to support.

A further barrier comes from Holliday et al., (2009), who (through interviews with school staff and observation of intervention delivery) found occasions where school staff appeared concerned about the school's image. This centred on the (highly likely) scenario where students who were not the best behaved in class were invited to become a peer supporter, which could be perceived as rewarding students for poor behaviour. At times this resulted in school staff intervening with the nominated list of students – i.e., not letting them take part for fear of damaging the school's reputation. A similar perspective came from Starkey et al., (2009) who conducted semi-structured interviews with school staff, peer supports and non-peer supporters to examine the selection of peer supporter process. They reported that staff expressed an interest in who was on the list, even though they took no part in assessing suitability. Related to this was the final point around school support - staff attendance at training and follow-up session which the authors noted varied and, in some cases, deteriorated as the intervention progressed,

*“Teacher attendance waned as the intervention progressed: 21 schools had a teacher present at the recruitment meeting; by follow-up 1 this had fallen to 18 schools; and by follow-up 4 this had fallen to 12. Generally, the more organized the school contact, the more likely it was that school-based sessions could be delivered to the intended schedule and in appropriate venues”*

(Holliday et al., 2009, p. 55.)

#### 3.5.3.4 *Characteristics of young people*

Holliday et al., (2009) highlighted that disruptive behaviour from peer supporters during the training delivery phase of the intervention could serve as a barrier to delivery. They noted feedback from trainers of occasions where schools had adhered to the intervention ethos and did not intervene to remove disruptive students. Starkey et al., (2009) also highlighted the importance of student characteristics for intervention delivery, from delivery of ASSIST. Their findings from teachers, peer supporters and students who were not peer supporters reported a view that some of the students selected to be peer supporter were not suitable (due to a lack of confidence or not taking their role seriously) which may have served as a barrier to intervention delivery,

*Just as teachers expressed some reservation, students who were not peer supporters and peer's supporters themselves expressed mixed opinions about the suitability of nominated students to undertake the role of peer supporter. Some were thought to be responsible and outgoing; others were considered unsuitable because they lacked the confidence to initiate conversations about smoking or did not take the task seriously.* (Starkey et al., 2009, p. 983.)

**Table 3.2: Evidence tables**

Reference	Study aims	Intervention	Sample	Country	Design	Key findings	Quality score
Andersen et al (2014)	Protocol paper to describe the development, component parts, pilot findings and future evaluation plan for the X:IT intervention.	Three components: 1. Smoke free premises – participating schools had sign up to indoor and outdoor smoke free premises 2. Parental involvement – one parent or guardian agrees to sign a smoke free contract where they support the adolescent to stay smoke free 3. Schools agree to deliver 8 smoke free lesson over a three year period	Head teachers, teachers (n=16), project coordinators (n=109), pupils (n=4,161).	Denmark	Mixed methods design  Findings presented from two sources: 1) pilot testing in ten schools. Qualitative consultation (mode not specified) with project coordinators, head teachers, teachers, pupils, and parents. 2) An effect, process and health economic evaluation. A cluster randomised control trial was used to test effectiveness. Pre and post student survey using existing survey questions. Questionnaires	Barriers: Schools overloaded with work and reluctant to impose further obligations on staff - study seen as too large problems fulfilling the smoke-free restrictions Head teachers viewed smoking as irrelevant compared to larger problems students face, meaning that other health promotion activities were prioritized Perception from some schools that they had few or no students who smoked.	-

					<p>completed by study coordinators and teachers</p> <p>Qualitative data collected as part of the process evaluation included: observation and semi-structured interviews with teachers (n=16) in participating and non-participating schools.</p>		
Hassandra et al (2009)	To examine the applicability of smoking prevention intervention called resource 'I do not smoke – I exercise'.	Delivered in school over 10 lessons by teaching staff who were given written instructions on how to deliver each lesson. Students were given a work book with information about smoking and exercise along with activities.	Seventh grade students (aged 12-13) from 8 classes in 2 private secondary schools 101 boys and 109 girls (n=210). School principals and teaching staff (n=8).	Greece	<p>Mixed method design</p> <p>Students complete questionnaires on 3 occasions (T1 at end of first lesson, T2 at end of last lesson, T3 12 months later).</p> <p>Semi –structured interviews with the school principals (n=2) and internal teaching staff who delivered the programme (n=6).</p>	<p>Facilitators:</p> <p>View form principals that the programme is best delivered by 'specialists' who are external to the school</p> <p>Programme delivers spoke of the potential for wider impact out with school into wider social networks</p> <p>Barriers:</p>	+

						<p>Lack of time to deliver the programme</p> <p>Perception that it was difficult for students to understand goal setting.</p> <p>Longer term outcomes at 12 month follow-up showed attitudes and interest in smoking information returned to pre intervention levels.</p>	
Holliday et al (2009)	To examine the fidelity of implementation of A Stop Smoking in Schools Trial (ASSIST)	Anti-smoking messages delivered by students (peer supporters) who were nominated by fellow students in their year. Peer supporters taken out of school for 2 day training delivered by external trainers who offer ongoing support over a 10 week period.	Trainers, researchers and sessional staff in 30 secondary schools in south Wales and west of England (n=319).	UK	<p>Mixed method design</p> <p>Pre and post self-complete questionnaires with researchers and sessional trainers who delivered some or all of the intervention component parts</p> <p>Qualitative element conducted with 4 schools selected for</p>	<p>Facilitators:</p> <p>Building in flexibility to session delivery - traffic light system to ensure core programme was delivered if issues with time arose.</p> <p>Barriers:</p> <p>Peer nomination and recruitment – staff appeared concerned about school's</p>	++

					<p>the in depth process evaluation. Included: non-participant observation at recruitment (n=3), training (n=4), follow up sessions 1 (n=4), session 2 (n=3), session 3 (n=4) and session 4 (n=3); and Semi structured interviews (post intervention) (n=11).</p>	<p>image/rewarding students for poor behaviour.</p> <p>Disruptive behaviour of peer supporters.</p> <p>Venue variation and suitability and effect on success</p> <p>Intervention timetable was often extended which was issue with maintaining interest with some students.</p> <p>Teacher involvement in sessions varied, and deteriorated as intervention progressed.</p> <p>Facilitators and barriers</p> <p>Training approach of trainers with a variety of backgrounds meant a variation in expertise and differences in style</p>	
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						which could cause conflict. Similarly, it could also allow a more rounded delivery of intervention.	
Small et al (2013)	The examination of the perspectives of professionals on youth smoking prevention.	Not a specific intervention but drawing on expertise from participants who have delivered a range of school-based smoking prevention interventions.	Teachers, public health nurses and employees of non-government organisation (n=9)	Canada	Qualitative design  Semi structured interviews (n=9)	Facilitators: Smoking prevention among youth required strong and sustained effort from three key players; parents, schools and society.  Barriers: Sense that smoking prevention was not a priority in schools and when it was taught it was lost in the general health topic Need to be covered throughout school career not just isolated to one-time point.	++

Starkey et al (2009)	To examine the success of a whole-community approach to identify a diverse group of influential young people to effectively diffuse health promotion messages among peers.	Same intervention as discussed above (Holliday et al, 2009)	School staff, students, peer supporters (see design column for sample detail).	UK	<p>Mixed method design</p> <p>Semi structured interviews at baseline (n=8) and post intervention (n=10) and a random sample of students who were not peer supporters (n=32).</p> <p>Post intervention focus groups (n=10 involving 77 students) and semi structured interviews (n=33) with peer supporters</p>	<p>Barriers and facilitators:</p> <p>Peer supporter's views about those nominated:</p> <p>Wide range of people took part</p> <p>Maturity was an issue</p> <p>Smokers seen as hypocritical advising others not to smoke</p> <p>Confidence of some participants questioned</p> <p>Non-peer supporters' views on those nominated</p> <p>Suitability questioned at times for some in relation to maturity, shyness, confidence and being a smoker themselves.</p>	+
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						Teachers views Good mixture of students reflecting those who were streetwise to those perceived as sensitive. Staff interested in who was on the list, even though they took no part in assessing suitability.	
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### 3.6 Summary

Much has been written about the delivery and effectiveness of school-based interventions to prevent adolescent smoking (Flay, 2009, Thomas et al., 2013a, Wiehe et al., 2005). However, results have been mixed depending on the type of programme delivered and little is known about the factors that influence intervention effectiveness. This qualitative review sought to address this evidence gap by updating an existing review to examine the barriers and facilitators to the delivery of school-based smoking prevention programmes.

The review identified several barriers that can make delivery of smoking prevention, health promotion interventions in schools challenging. However, as illustrated in the discussion below, it also identified a number of facilitators to help overcome them. Thus, for interventions like ASSIST schools (due to student attendance being compulsory) remain the best setting for delivery. Four themes were identified to summarise the barriers and facilities to delivering school-based smoking prevention interventions.

*Delivery approach*, focused on how the intervention was actually delivered (i.e., what its components were, who delivered it and what was required of the schools to assist in delivery). It also included practical aspects like venue for intervention delivery. Facilitators were: having specialists to deliver the intervention who were external to the school (i.e., not school staff) and had the required level of expertise. This makes intervention delivery less burdensome for the schools in terms of level of resource and, thus, more likely that they will support delivery in their school. Barriers to intervention delivery were intervention components being overly ambitious and expecting schools to contribute more than they were able to, in addition to inappropriate time slots and venues.

*Programme content*, highlighted the importance of designing interventions that were flexible enough to fit in with schools and students and facilitate school support. Facilitators were: tailoring the intervention to accommodate restrictions within the school timetable; and having booster sessions after the intervention has been delivered to reinforce key messages. The main barrier was working with the challenges of school timetables, which restricted time to deliver the intervention.

*School support*, centred on the barriers to securing school support to help deliver the intervention, with the main facilitator being external intervention delivery, which did not require a high level of resource from the school. Barriers were four fold: 1) not viewing smoking a

priority due to the low smoking prevalence rate in the school and, therefore, not a worthwhile investment of school resources (i.e., staff time); 2) schools being overloaded with other commitments and not have the capacity for delivery in their school; 3) concern about potential impact on school's image/reputation; and 4) schools agreeing to support delivery and then not being able to honour this.

*Characteristics of young people* focused on the disruptive behaviours from some students and a perception from school staff that some students selected to deliver peer support were not suitable.

There are limitations to this systematic review. Only five studies were identified for full review, which limits confidence that findings are relevant to smoking prevention interventions in general. However, generalisability is not the purpose of qualitative research and the included studies did highlight a range of barriers and facilitators that may inform future interventions. That said there were far fewer studies that met the inclusion criteria for full review with two potential explanations. This could be a reflection of the drop in adolescent smoking prevalence discussed in Chapter Two and/or highlights a lack of qualitative studies. While a range of databases were used to identify relevant articles, and a grey literature search undertaken, the review did not explicitly ask experts or authors for other studies of relevance. In addition, the restriction to English is acknowledged as a language bias. The cost of high-quality translations of in-depth qualitative data was beyond the resources available.

# **Chapter 4: Social network research and network interventions**

## **4.1 Introduction**

Previous Chapters (One, Two and Three) have highlighted the importance of social networks when considering adolescent smoking behaviours and have characterised ASSIST as an example of a network intervention. They have also argued that there is currently no evidence looking at the extent of message diffusion into the wider social networks of peer supporters taking part in the ASSIST programme. Given that exploring this is a key aim of this thesis (along with understanding the context and composition of message diffusion in peer supporter networks), this chapter focuses on developing a greater understanding of social network analysis and network interventions, which will inform my research design, discussed in the next chapter (Chapter Five).

The chapter is comprised of three sections. Starting first with a definition of what social network analysis (research) is and a brief historical overview charting its rise in popularity since the 1930s. Next is a detailed review of the different approaches to collecting and analysing network data using quantitative, qualitative and mixed method approaches in section two. The final section widens the focus to look at social networks and health behaviour change, with specific consideration given to what network interventions are and the theory that supports them. This is important as ASSIST is one of a few examples of an evidence-based network intervention.

## **4.2 Definitions and historical overview**

Crossley (2010), describes social networks as ‘social worlds’ made up of various individuals with shared ‘meanings, purposes, knowledge, understandings, identities’ which affect how and who they interact with. Social Network Analysis (SNA) seeks to understand these ‘social worlds’ by studying relationships and connections most commonly, although not exclusively, between individuals. SNA works on the principle that individuals are influenced by people they have contact with and vice versa (Christakis, 2010).

Luke (2007), traces the origins of SNA to the 18th century and credits mathematician Leonhard Euler as providing,

*one of the mathematical foundations of network analysis*

*(Luke and Harris, 2009, p.70.)*

Valente (2010) and Scott (2013), highlight the important contribution made by Moreno who, in the 1930s, devised the 'sociogram' to visually show connections between individuals, a method still used which will form an important element of my research design (discussed in 5.3.2.3).

Scott (2013), notes that due to the merging of different academic disciplines working in SNA (such as: mathematics, sociology, social psychology and anthropology), the mid-20th century was an important period in the development of SNA. This resulted in the creation of the International Network for Social Analysis (INSNA) to support the growth of SNA, and two specific journals (Social Networks and Connections). More recently, the emergence of computer programmes in the mid-1980s made it easier to map complex networks and explain connections (Scott, 2013, Wasserman, 1994). The 1990s generated further traction when the public health field started to realise the potential of SNA to provide a new lens to frame and answer important public health questions (e.g., analysing the spread of HIV/AIDS and peer influence on risky behaviours (Luke and Harris, 2007). Add to this the growth of the World Wide Web and social networking sites (e.g., Facebook and Twitter, which makes it easier to acquire network data), it is no surprise that SNA has become relevant to multiple disciplines (Scott, 2013).

### **4.3 Approaches to collecting and analysing social network data**

To help inform potential data collection approaches to (discussed further in Chapter Five) the purpose of this section is to review different approaches to collecting and analysing network data using quantitative, qualitative and mixed method approaches.

Broadly speaking there are two types of network data: 'whole' and 'egocentric' networks. Whole networks are concerned with an entire population (defined by pre-specified inclusion criteria – e.g., an entire school or an entire corporation (2015, Domínguez and Hollstein, 2014). In contrast, an egocentric network (also called an 'egonet' or personal network), is the network of one individual (the ego), with members of their network called 'alters' or 'actors'. Egonets are usually represented using visualisation techniques such as sociograms (Robins, 2015). In the 1930's Jacob Moreno (a psychiatrist) created the term 'sociogram', which is a

visual way to show the structure of interpersonal relationships (typically in a graph or circular shapes) (Scott, 2013, Ryan et al., 2014). Ryan et al., (2014) note that a further development was made in the 1940s with the inclusion of concentric circles to illustrate levels of closeness or distance in the network (see Figure 4.1). As noted by Crossley et al., (2015) the addition of concentric circles enables the analytical process to run alongside data collection as participants (egos) are ranking the people they add to their map and therefore evaluating their relationships as their maps are created.

There are several studies that have included the use of sociograms into their research design (Tubaro et al., 2016b, Ryan et al., 2014, Hogan et al., 2007, Antonucci, 1986, Bellotti, 2015, Heath et al., 2009b, Ryan, 2011a, Reith and Dobbie, 2013, Emmel, 2009), with Tubaro et al., (2016a) noting two common approaches. The first is for the researcher to collect data from the participant about their network members and then draw the networks (typically using computer software) and present it back to the participant (the ego) for their review. The second is to ask participants to draw their own networks either free hand or using a pre-defined tool/framework. They note that, regardless of which approach is used, visualising networks using sociograms:

*... gives participants a more global view of their relationships and the social contexts they are embedded in, a view that would not emerge spontaneously from just describing their relationships in interviews, or adding names of contacts to a list in a questionnaire.*

(Tubaro et al, 2015, p. 3.)

Given that a key objective of this thesis is to understand the composition of peer supporter social networks, network analysis has been incorporated into the research design. Before the practical steps to collecting these data are presented in Chapter Five, the different approaches (which informed the research design) to collecting and analysing network data using quantitative, qualitative and mixed method approaches are considered below.

#### **4.3.1 Quantitative ‘formal’ methodologies**

Traditionally, social network researchers have used quantitative techniques to measure the structural properties of a network and connections (ties) between individuals (also called ‘alters’ or ‘actors’) (Bellotti, 2015, Heath et al., 2009b, 2015). Heath et al., (2009b) describes this approach as ‘formal’ SNA. Edwards (2010), notes that formal SNA is particularly interested in the ‘flow’ of the network and the factors that affect this. Examples include trade movement

between countries, the spread of infectious disease, diffusion of ideas and information, and providing social support. As noted by Crossley and Edwards (2016), a particular strength of 'formal' SNA is its ability to systematically map and measure social relations,

*“quantitative techniques of SNA are crucial for identifying and measuring the properties of networks and for identifying associations between such properties and wider behaviours and factors that might be regarded either as causes or effects of them”*  
(Crossley and Edwards, 2016)

However, they also note that qualitative research is essential to understand the 'how' and 'why' of these associations (Edwards and Crossley, 2009). A particular criticism of quantitative SNA, therefore, is that it provides static 'snapshots' of social relationships which in practice will continue to change and evolve, and lacks important detail in relation to content, context and meaning (Edwards, 2010). For example, Bearman and Parigi (2004), explored how respondents understood a question from the General Social Survey (a large US household survey that collects social network data) which asked – *'who do you discuss important matters with'*? Their analysis, based on 768 telephone interviews with adults living in North Carolina, resulted in two key findings. First, they challenged previous interpretations, which suggested that participants who reported not talking to anyone also experienced social isolation. Instead, they found that over half (56%) who reported not talking to anyone did so because they simply felt that they had nothing to discuss. Second, they found that interpretation of the question used to collect network data was wide and varied with participants conceptualising the term 'important matters' in different ways - some talked about personal issues such as caring for elderly parents or health and family matters, whereas, others talked about things that might be considered unimportant or trivial – such as a new haircut and lawn care.

This example highlights the limitations of using survey questions to collect network data, with some network scientists arguing that SNA has developed in the 'formal' (i.e., quantitative) sense with only limited attention paid to the contribution of qualitative approaches in SNA. As Bellotti (2015) states:

*researchers have often complained about the unbalanced ratio between the use of quantitative and qualitative tools in networks studies, claiming that the discipline has favoured the development of highly sophisticated formal methods at the expense of the detailed and rich descriptions of social networks and calling for a more systematic (re)introduction of qualitative methods. (Bellotti, 2015, p. 3)*

This lack of qualitative SNA has led to the criticism that formal SNA may fail to capture the depth and diversity of social networks. With Crossley et al (2015), noting that ‘formal’ SNA gives an ‘outside’ view of the network, but the addition of qualitative data adds the ‘lived’ experience. Further, a lack of qualitative methods have been noted as unusual by several authors who point out that early SNA studies drew on qualitative methods (Bellotti, 2015, Hollstein, 2011, Heath et al., 2009b). Finally, Bellotti notes that network science has much to offer qualitative social scientists concerned with moving beyond individual determinants of behaviour and fits well with theories that seek to explore the importance of relationships and interactions between individuals and their social environment, such as Bronfenbrenner’s ecological system theory (Bellotti, 2015).

### **4.3.2 Qualitative and mixed methods**

In recent years Knox et al., (2006) has argued that there has been a ‘cultural turn’ in network science which recognises that networks are not just structures to be observed and measured but have cultural formations with narratives that need to be understood. As Hollstein notes, in the last 20 years the field of network science has also come to appreciate that:

*“... focusing on either quantitative or qualitative research techniques alone leads researchers to miss important parts of the story. Researchers have found that better results are often achieved through combined approaches”*

(Dominguez and Hollstein, 2014, p.109.)

This has culminated in the rise of qualitative and mixed methods to collect and interpret social networks (Domínguez and Hollstein, 2014, Crossley and Edwards, 2016, NickCrossley et al., 2015, Edwards and Crossley, 2009, Bellotti, 2015). These approaches have tended to focus more on the content and context of social ties and the narratives used to explain them, and less on the structural properties of the relationships. In particular, several authors have noted the rise of data visualisations tools, such as sociograms, commenting on their contribution to both data collection and analysis. For example, Ryan’s (2011a), study of Polish migrant workers demonstrated the value of incorporating sociograms into face to face interviews, arguing that it elicits ‘richer data’ by adding greater insight into the content and meaning of individual narratives (Ryan, 2011a).

### 4.3.3 Approaches to collecting and analysing network data

A paper by Edwards (2010), sought to explore the different ways that qualitative and quantitative methods have been used in network studies. She noted the 'variable' use of qualitative methods, which were rarely used in isolation but often combined with quantitative methods for data collection and/or analysis of network data. Of particular interest was the finding that some studies had collected network data using only qualitative methods but these data were then analysed using a mixed method approach – i.e., both quantitative and qualitative analysis methods. A limitation of her review is the lack of detail in relation to how many studies were reviewed, the inclusion/exclusion criteria or how the study quality was assessed. Nonetheless, Edward's work identified three approaches which furthers our understanding of conducting and analysing network studies using quantitative and qualitative methods.

#### 4.3.3.1 *Approach 1 – mixed methods to inform research design only*

The first approach, includes multi-stage (mixed methods) networks studies where qualitative research is conducted to inform subsequent quantitative data collection methods and vice versa. Edwards, (2010) cites an ethnographic study conducted by Dolcini et al (2005) which explored adolescent friendship networks and risk taking behaviour as an example of this approach. In the first phase they used qualitative observation methods to acquire a greater understanding of the cultural context in which the study was situated. This then informed the design of the next (quantitative) phase of the study which was a survey.

#### 4.3.3.2 *Approach 2 – mixed methods for data collection and analysis*

The second approach involves the use of qualitative and quantitative methods for both data collection and analysis. This is often referred to as 'triangulation' where qualitative and quantitative data are collected and analysed to generate a deeper, more informed, understanding of a particular phenomenon. However, Silverman (2014), cautions against mixing methods which he argues could result in poor analysis. Despite speaking for mixed methods studies in general, it is also relevant for network data collection,

*Mixed methods are often adopted in the mistaken hope that they will reveal 'the whole picture.' But this 'whole picture' is an illusion which speedily leads to scrappy*

*research based on under-analysed data and an imprecise or theoretically indigestible research problem.* (Silverman, 2014, p. 47)

Nevertheless, in social network research there is strong support and a growing body of research studies using mixed method approaches, which most likely reflects a desire to examine both the structure of the networks and the meaning and context that underpins them (Bellotti, 2015, Heath et al., 2009b, Ryan, 2011a, Ryan et al., 2014, Tubaro et al., 2016b). An example comes from Bellotti's study of friendship networks of single men and women living in Milan (Bellotti, 2015). A two-stage research design was used – first network maps were created using name generation questions (a classic 'formal' approach where participants are asked to generate a list of names of people in response to a specific question – e.g., list the names of 10 co-workers, this is usually done using a survey approach) which allowed 'formal' exploration of the structure of the networks and connections between friends. These maps were then visualised using a computer aided software package call Netdraw and given back to participants and used as prompts for deeper exploration of the 'content, meaning, history and dynamics of friendship' using a qualitative in-depth interview.

Bellotti concluded that:

*The combination of social network analysis and qualitative methods allows observing and measuring at the same time the formal structure of networks and the content and dynamics of these structures.* (Bellotti, 2015, p. 77.)

Edwards (2010), also adds that combining methods in this way enables both an 'outsider' (i.e., the structure of the network) and 'insider' (i.e., network context and meaning) view of the network, which would have been lacking if a mixed method approach was not used.

#### **4.3.3.3 Approach 3 – data collected using qualitative methods, analysed using quantitative and qualitative methods**

The third approach uses qualitative methods to collect data but analysis is conducted using quantitative and qualitative methods. In approaches one and two a key component was the inclusion of quantitative data collection, e.g., a survey. In contrast, approach three does not include any quantitative data collection, with network data collected using qualitative methods only. However, at the analysis stage, both quantitative and qualitative methods are used, which Edwards argues is a strength of social network research,

*Qualitative data on networks can not only be transformed into numerical data for statistical analysis, but it can also be subject to content analysis to explore meanings, perceptions and dynamic processes, whilst simultaneously providing crucial contextual details that aid in the interpretation of structural measures.*

(Edwards, 2010, p. 45)

Qualitative researchers would no doubt be uncomfortable with the idea of using qualitative methods for data collection and then quantifying findings into numbers, as Edwards suggests. However, I would argue that this is a legitimate approach when conducting social network research. For example, this could involve qualitative data collection, such as in-depth interview. The interview would be divided into two parts. Part one would focus on mapping the participants' social network using sociograms (which have the potential to be counted and ordered) and then, in part 2, qualitative interviewing probing techniques would be used to further understanding of the phenomena of interest. Both parts would take place in one interview. Analyses could then be conducted on two levels: 1) the production of network maps using 'formal' network analysis where the structural properties of the network are presented and; 2) qualitative analysis to create a greater understanding of the network composition and explore specific area of interest. Crossley et al., (2015) refer to this as a 'bifocal' approach':

*Qualitative sources therefore enable what has been referred to as a 'bifocal approach' to social networks that can involve both quantitative and qualitative forms of analysis.* (Crossley et al., 2015, p. 106)

A practical example of this bifocal approach comes from Edward and Crossely's work which explored the social networks of suffragette Helen Kirkpatrick Watt (Edwards and Crossley, 2009). Network data was collected from archival sources (letters sent by Helen Watt), with both quantitative and qualitative analytical approaches used. For example, the number of people she wrote to was analysed quantitatively, but the content of the letter was analysed thematically.

#### 4.3.3.3.1 *Applicability to this thesis*

Due to the aims and objectives of this thesis (set out in Chapter One and discussed further in Chapter Five) approach 3 could be a potential model for research design. For example, data

could be collected using qualitative in-depth interviews that will include the use of sociograms to map peer supporter networks and collect network data, which will be analysed quantitatively. However, the interview would also include in-depth probing to understand more about who peer supporters decided to speak to or not about smoking as well as the context and influencing factors in which these conversations took place. This would be collected in one interview, not two and analysed qualitatively. Thus, the research design would not be mixed method using the definitions commonly used in research methods text books (Blaikie, 2019, Creswell, 2013), which describes mixed methods studies as involving,

*The collection of, analysis and mixing of both quantitative and qualitative data in a single study or a series of series of studies* (Blaikie, 2019, p. 131)

Instead, data collection would be qualitative, with no separate quantitative data collection. However, it would be mixed method in terms of analysis because it would use both quantitative and qualitative analytical approaches that will be triangulated. I would, therefore, describe this approach as '*a qualitative study using a mixed method analytical approach*'. Chapter Five considers this in greater depth, as well as the logistics and practicalities of data collection and analysis using this approach.

#### *4.3.3.4 An additional approach - network data collection without any 'formal' analysis*

Edward's (2010), summary of the different approaches to conducting network studies provided a useful lens in which to view the different ways to collect and analyse social networks using qualitative and quantitative methods. A key theme across all three approaches was the inclusion of 'formal' network analysis. However, my review of the literature to inform the research design for this thesis highlighted a fourth approach – *network data collection without any 'formal' analysis*. In this approach, network data are collected qualitatively using sociograms which are used as a tool to facilitate a deeper understanding of the phenomena of interest. However, these data are not analysed using 'formal' social networks analysis because there is no interest in measuring the structural properties of the network. Instead, sociogram creation is a visual tool to support the interview, i.e., it is something that enables the participant and the interviewer to find a starting point to generate a deeper understanding and meaning of the area of interest.

An example comes from Emmel and Clark's (2009), 'Connected Lives' study which sought to explore the networks of neighbourhoods and communities in Leeds, UK, with a specific interest in what happens in the network and how they are constructed, maintained and breakdown. They described their research design as a 'qualitatively-driven mixed method approach'. It was mixed method because they included secondary analysis of existing quantitative data to contextualise the study by understanding more about the geographic areas they were sampling from. This included census data for demographic information and local council data to look at levels of crimes, welfare benefits and health.

They then used a range of qualitative methods to understand how networks, neighbourhood and communities operate (in both a spatial and temporal context) which included: walkabouts (walking around the research site); key informant interviews; walking interviews with local residents; observation; and field diaries. Local residents were interviewed and asked to draw their networks (for some who lacked literacy skills interviewers did this on their behalf) and add lines to show the connections between people in their networks (see Figure 4.1). Interviewers then used the maps to facilitate discussion about how the participant had chosen to present their networks and how they perceived the people within it (so very similar to approach three). Crucially the maps were not used to generate 'formal' network data, as noted by the authors,

*The participatory maps diverges from other methods of developing sociograms because it does not seek to explore specific researcher defined attributes of a network such as the strengths and weaknesses of ties; the importance of a relationship; nor does this mapping seek to constrain and limit the investigation to a specific number of people doing particular things, as is common in network analysis.*  
(Emmel and Clark, 2009, p. 16)

Interestingly, the authors also note that they had planned to conduct 'formal' network analysis, but were unable to do so. They do not explain why this was the case but judging by the sample map (Figure 4.1, Hogan et al., 2016) – the complexity of the maps created would not easily facilitate formal network analysis because they are too hard to read, especially the lines which show the connections between people on the map.

**Figure 4.1: Sociogram example from the Connected Lives study**



Thus, whilst qualitative and mixed method networks scholars argue that network data can be collected qualitatively and then analysed quantitatively, this is dependent on maps being clear and not overly complex in detail, which as noted by Hogan (2016), is often not the case.

*...when displaying a large number of nodes or relationships, graphs quickly become too complicated to easily interpret, or to be used to develop clear understandings of micro-level structural details. (Hogan et al., 2016, p. 24)*

Further examples of this fourth approach come from, Ryan's (2011) study of Polish migrant workers and Heath et al's., (2009b) study of educational decision-making processes. Ryan argues that this approach elicited 'richer data' by adding greater insight into the content and meaning of individual narratives (Ryan et al., 2014). In Heath et al's., (2009) study, participants mapped their network using sociograms which, like Emmel and Clark's study (2009), were explored further via a face-to-face interview, but did not include any 'formal' analysis of the network structure. Heath notes that a particular strength of this approach was that maps were created by the participants, using a 'realist' approach in which the boundaries of the map were

imposed by the participants (e.g., the number of people they place on the map). This is in contrast to a 'nominalist' approaches where network boundaries, in terms of numbers, are set by the researcher (Heath et al., 2009b).

## **4.4 Network interventions and health promotion**

The focus of this chapter, so far, has been to present a brief history of SNA and to describe the different approaches to data collection and analysis, which informed the research design presented in Chapter Five. However, in recent years, health behaviour change scientists have realised the potential of social networks to serve as conduits of behaviour change. This is explored further in this last section, followed by an introduction to network intervention theory, on which ASSIST is situated.

### **4.4.1 Social networks and health**

Several studies and reviews have shown the link between social networks and health. For example, Berkman and Syme's (2017) study showed that the age adjusted relative risk of death amongst women with the least social ties (i.e., connections to other people such as family, friends, colleagues neighbours etc.,) was 2.8 times higher in comparison to those with most social ties and 2.3 for men. This and other scientific evidence (Umberson and Karas Montez, 2010, House et al., 1988) supports Umberson's conclusion that,

*Studies consistently show that individuals with the lowest level of involvement in social relationships are more likely to die than those with greater involvement.*

(Umberson and Karas, 2010, p. 2)

Low quality, or quantity of, social ties can also increase an individual's chance of developing specific medical conditions including cardiovascular disease, high blood pressure, and cancer (Umberson and Karas Montez, 2010). The link between social networks and health also extends to health behaviours such as physical activity (Sawka et al., 2013, MacDonald-Wallis et al., 2012, Maturo and Cunningham, 2013) and diet (Fletcher et al., 2011, Christakis and Fowler, 2007). To take smoking as an example, the existing literature tells us that the attitude and smoking behaviour of partners, family and friends can be an important influence on smoking initiation and act as a barrier and facilitator to smoking cessation (Christakis and Fowler, 2008, Hitchman et al., 2014, Huang et al., 2014, Sterba et al., 2011).

As a consequence, there is support and recognition within the public health field for the potential of social networks to create health behaviour change. However, despite this recognition, there is a lack of evidence looking at how this link can be ‘engineered’ or utilized, to create health behaviour change. In short, there is a lack of studies incorporating social networks into intervention design to create health behaviour change. As illustrated by Rovniak et al., (2016) whose point, despite making reference to physical activity, has wider resonance to other health behaviours,

*Despite growing recognition that social networks both shape and mirror community-level physical activity, little is known about how best to engineer social networks to sustain physical activity.* (Rovniak et al., 2016 p. 9)

Whilst this is true, one of the reasons why there is a lack of evidence-based network interventions may be due to poor engagement from health behaviour scientists with network scientist. As illustrated Chapter Three, there were examples from the systematic review that included features from network science but were not labelled as such.

#### **4.4.2 Social network interventions**

The link between social networks and health outlined above resonates with the work of Robert Putnam that popularised use of the term ‘social capital’. Putnam, describes social capital as connections between people and the power of social networks to promote trustworthiness, set social norms and promote community cohesion. This can enable communities to grow and collectively resolve problems (Putnam, 1995, Putnam, 2000). As noted by Green et al,

*There has been considerable interest in the notion of social capital as a means of improving health prospects and particularly as a response to the adverse effects of social exclusion.* (Green et al., 2015, p. 93)

Thus, it is not surprising that there is growing interest in the potential of social capital, found in social networks, to promote positive health behaviours and create health behaviour change. Valente (2012), introduced the term ‘social network interventions’, which he describes as

*purposeful efforts to use social networks or social network data to generate social influence, accelerate behaviour change, improve organisational performance, and/or*

*achieve desirable outcomes among individuals, communities or organisations or populations.* (Valente, 2012, p. 49)

In 2012, Valente conducted a review of social network interventions and identified four separate approaches to using social networks to inform behaviour change interventions. The first was to recruit individuals (also called nodes) to serve as champions to promote behaviour change. Champions are identified by looking at the 'centrality of a social network' (where someone sits in the network and the number of connections with other members of the network) which can be an indicator of power and influence. In contrast, segmentation approaches focus on identifying groups of people (also called 'cliques'), who are specifically targeted. For example, introducing a new piece of technology or policy into the workplace may only work if the entire group adopts it. Induction interventions promote the cascading of information through networks and are common in media campaigns – e.g., a word of mouth campaign to encourage friends and family to recommend products to members of their network. Induction can also be used as a recruitment tool via respondent driven sampling (RDS). RDS, also known as 'snowballing' relies on network members (also known as 'seeds') to recruit members of their network. This approach is particularly effective for hard to reach groups, such as injecting drug users (Broadhead et al., 2006, Latkin et al., 2003). The last approach, alteration, is different to the first three (which assumes the network is static i.e., ignores network dynamics that may influence behaviour) because it seeks to alter the network to change behaviour by adding or deleting nodes. In the field of health behaviour change adding nodes generally involves introducing 'change agents' such as lay health advisors or other health professionals to create behaviour change. In contrast deleting nodes aims to change the network dynamic by removing critical nodes who are not enablers of positive behaviour change. For example, a paper by Hitchman et al., (2014) looked at whether changing the number of smokers in a social network affects smoking cessation. Results found that smokers who reduced contact with their smoking friends had more successful smoking cessation attempts than those who experienced no change in their number of smoking friends. This led to the conclusion that,

*Quitting may be particularly unlikely among smokers who do not experience a loss in the number of smokers in their social context.* (Hitchman et al., 2014, p. 1)

Another approach comes from Heaney and Israel (2008) who present a network intervention typology (comprising of four elements) to enhance social network support. The first element, '*enhancing existing network ties*', centres on the assumption that existing social networks offer

untapped potential. These interventions focus on strengthening existing relationships and equipping network members with new skills to provide additional support (Park et al., 2012, Donatelle et al., 2000). However, this is dependent on being able to identify existing network members who not only have the capacity, but also the inclination to provide additional support. In addition, it also ignores the fact that some connections will be negative and therefore strengthening positive ties and not negative ties could be difficult to manage. Next is developing new social '*network linkage*'. These interventions seek to create new ties and are often most successful in small social networks or networks that are unable to provide effective support (e.g., ties promoting negative health behaviours like smoking for example). Typically, these interventions centre on introducing a mentor or buddy who can offer mutual support and encouragement (group smoking cessation classes for example where people are encouraged to 'buddy up'). Self-help groups and internet-based support group are also examples of interventions providing new social ties (Eysenbach et al., 2004). The third typology is '*enhancing networks*' through the use of natural helpers and community health workers. Natural helpers are people within a network who are trusted sources of advice and support and can also link network members to each other and access external sources of support. The challenge with this intervention approach is to find a way to identify these natural helpers; a common approach to ask members of the social network to identify people who have the characteristics of a natural helper. Once recurrent names are identified these people can be recruited to deliver health promotion messages to their network. The final typology is enhancing networks through community building and problem solving. This approach identifies and includes social network members to resolve community problems, which may in turn strengthen their existing social networks.

#### **4.4.2.1 Implementing social network interventions**

Heaney and Israel (2008) argue that one of the barriers to developing network interventions is identifying an appropriate theory to underpin intervention design, failing to see SNA as theory in its own right. Heaney and Israel justify their position by arguing that the terms 'social networks' and 'social support' are concepts describing structure and therefore are not theories. For example, Umberson and Montez (2010) describe social networks as a 'web of social relationships' that surround an individual, whereas social support is delivered via the social relationships within a social network (Heaney, 2008). Thus, social networks are quantifiable, objective and measurable. Members of a social networks (called alters or nodes) can be counted, their characteristics can be analysed and frequency of contact measured. Social support, in contrast, is more subjective and therefore difficult to quantify (Maulik et al., 2011). Social support is a conscious, deliberate action given with the intention to offer positive

support, whether or not it is viewed this way by the recipient is less clear but it can be categorised in four ways:

1. emotional support (empathy, love, trust and caring);
2. instrumental support (tangible aid and service of direct assistance to a person in need);
3. informational support (provision of advice, suggestions and information to address problems); and
4. appraisal support (provision of constructive feedback)

A further criticism of the network intervention approaches presented above is the limited assessment of their application in practice – i.e., how do social network interventions work in practice and how effective are they? It is therefore not surprising that Hunter et al., (2015) calls for further research into social network intervention design for public health,

*Whether social networks could be harnessed to support a successful public health intervention depends on a range of practical and theoretical issues that have yet to be studied.*

(Hunter et al., 2015, p. 514)

This is why ASSIST is an important example of a network intervention; not only does it draw on network intervention theory and apply it to young people (enhancing networks through the use of natural helpers, using champions and induction approaches), it has also been rigorously evaluated. This means assessment can be made about the contribution of network intervention theory to health behaviour change, in this case the prevention of adolescent smoking.

## **4.5 Summary**

This chapter sought to achieve two things. First, to further understanding of social network research, with a specific focus on the different approaches to collecting and analysing network data. This helped to shape the research design for the thesis, summarised as ‘*a qualitative study using a mixed method analytical approach*’. Chapter Five will discuss this in more detail. Second, was to focus more broadly on the contribution of social network interventions to health promotion and health behaviour change. This helps to contextualise ASSIST, which is unique due to it being an example of an evidence-based network intervention targeting young people.

Part one concluded that SNA has been criticised for its focus on ‘formal’ SNA relying on quantitative methods, which fail to capture the depth and diversity of social networks due to a lack of qualitative methodology. More recently, qualitative and mixed method SNA scholars have attempted to address this imbalance by incorporating qualitative approaches into the collection and the interpretation of network data (Tubaro et al., 2016a, Ryan et al., 2014, Ryan, 2011b, Bellotti, 2016). Despite these recent advances, findings from Chapter Three have already highlighted a lack of tobacco studies collecting network data from children and young people using qualitative approaches. This is in contrast to the numerous studies using quantitative approaches, suggesting that the field has some way to go to address the imbalance between quantitative and qualitative approaches to SNA with children and young people. The novel methodology developed for this thesis (discussed further in Chapter Six) attempts to contribute to qualitative SNA by collecting network data from young people using sociograms and then contextualising these data via qualitative face to face interview.

Part one also reviewed three approaches to collecting and analysing network data. An additional (fourth) approach was also presented which gave examples of qualitative and mixed method social network studies, with an explicit purpose to investigate social networks but none of them applied any ‘formal’ analysis of the networks structure. Thus, it could be argued that they are examples of social network research rather than social network analysis. Adopting this broader terminology is more inclusive of the different approaches to studying social networks, yet both terms are used in the existing social network literature (Robins, 2015, Domínguez and Hollstein, 2014, Bellotti, 2015) (often interchangeably) which does not help promote wider engagement with network science from the broader academic community. In light of this, I will use the term ‘*social network research*’ to describe the research design presented in Chapter Five.

In part two, a review of literature on ‘network intervention theory’, on which ASSIST is based identified an adult centred perspective, with limited understanding of their applicability to children and young people. Nonetheless, the broader theme of social networks and their influence on health, attitudes and behaviour is applicable to all ages. A further finding was the need for much more practical implementation of network interventions to evaluate their effectiveness in the ‘real world’. Building on the key findings presented here, Chapter Five will describe the research design and methods used when conducting the research for this thesis.

## Chapter 5: Methods

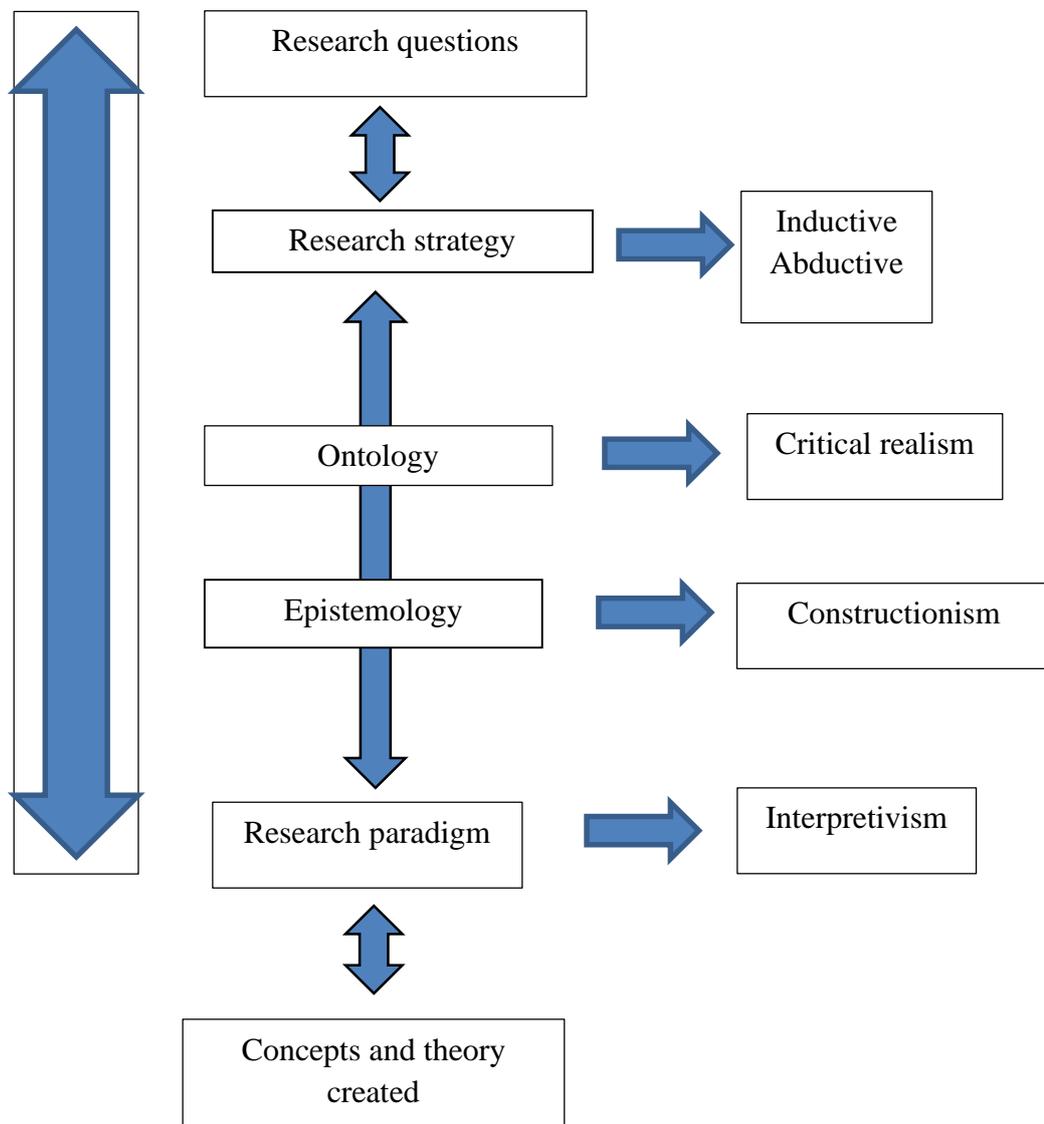
### 5.1 Introduction

Previous chapters have argued that there is a lack of evidence looking at the extent of ASSIST message diffusion in peer supporter social networks and the potential for wider influence beyond the school year. This thesis seeks to address this gap and Chapter Five will discuss the methodological considerations for an empirical study to collect primary data to generate this new evidence base. The chapter has two parts. Part one considers the philosophical underpinnings (i.e., the *thinking*) that shaped and influenced research design and analytical approach which is discussed in part two (i.e., *doing* empirical research).

### 5.2 Part 1 - *Thinking* about philosophical underpinnings

My intention for part 1 is for the reader to have a better understanding of the *'thinking'* which informed my research design (presented in part 2). Starting first by considering the importance of ontology and epistemology, I will then move onto the research paradigms of 'positivism' and 'interpretivism' and finally consider inductive; deductive; retroductive and abductive research strategies to help answer the study research questions (presented in 5.3.1). Drawing on Blaikie's (2009) diagram of research strategies and paradigms, I created Figure 5.1 to summarise my own philosophical perspective and the paradigms which underpin the research study discussed in part two. Each element of Figure 5.1 will now be considered.

**Figure 5.1: Philosophical factors that have influenced the research design (adapted from Blaikie (2009) p. 81)**



### 5.2.1 Ontology and epistemology

Research design is influenced by two important philosophical perspectives which relate to the social world in which we live - *ontology* (how we view the world) and *epistemology* (how we acquire knowledge (Ritchie et al., 2014)). Our own ontological perspective will influence the research study aims and objectives and our epistemological perspective will influence how we choose to collect and analyse the data. (Ritchie et al., 2014) note that ‘broadly speaking’ there are two ontological positions - realism and idealism. **Realists** view the world as existing independently, irrespective of personal beliefs or understanding or more specifically, as noted by Silverman (2016), how the researcher studies it. So, what we see exists externally to our

mind, which means that everything we experience through, for example, touch, sight, taste, smell and sound is exactly how we perceive it to be. **Idealists**, on the other hand, believe that reality exists in the mind and is influenced by society and social construction (Ritchie et al., 2014). Within the idealist ontological position there are several variants such as subtle, contextual, collective or radical idealism. For **realism**, there is also different variants, some with the same meaning such as: naïve, cautious, depth, subtle, shallow, conceptual, critical, social realism and materialism (Ritchie et al., 2014).

As illustrated in Figure 5.1 the chosen ontological perspective for this thesis is **critical realism** (also referred to as subtle or social realism), which translates to a belief that reality exists independently to those who observe it. However critical realists recognise that to understand reality (i.e., the social phenomena of interest) it has to be observed and understood through the individual (Ritchie et al., 2014, Blaikie, 2009). Thus, whilst what we see is real, how we interpret it is influenced by individual experience, which is often diverse and complex.

As noted previously, epistemology is concerned with generating knowledge about the reality of the world in which we live. Blaikie (2009) describes five types of epistemological positions: Empiricism; Rationalism; Falsification; Neo-realism and; Constructionism. Constructionism, views knowledge as being constructed by the individual, who is trying to make sense of the world in which they live (Ritchie et al., 2014). Thus, researchers are motivated to explore and understand the social world of the participant and seek to create meaning from this using an inductive logic where findings are grounded in the data. Constructionism, is therefore, a good fit for the research questions of this thesis (discussed in 5.3.1). However, Blaikie (2009) cautions that interpretation of meaning will be from the researcher's perspective which will inevitably be affected by their assumptions, experiences and beliefs. This highlights the importance of researcher reflexivity (i.e. having an awareness of the researcher role and how this affects data collection and outcomes from the research) and considered in Chapter Nine (9.5.1).

## 5.2.2 Philosophical paradigms

A philosophical paradigm is a belief system or theoretical approach that guides how we do something. Research paradigms provide an intellectual context which influences our ontological and epistemological assumptions and methodological approach. The two main research philosophical paradigms are '**Positivism**' and '**Interpretivism**', although Blaikie (2009) identifies several others, such as: Classical Hermeneutics; Critical Rationalism; Critical

Theory; Ethnomethodology; Social Realism; Contemporary Hermeneutics; Structuration Theory and Feminism (Blaikie, 2009).

Positivism asserts that knowledge generation can be independent of the participant, researcher and research setting. It is generally associated with quantitative approaches which are deductive and 'top down' where data is collected to confirm or reject a hypothesis. Positivism assumes that scientific knowledge is governed by general laws and universal statements that allow the researcher to control and predict events. Qualitative researchers generally reject this position because it does not always apply to the social world which is governed by meaning rather than rules (Ritchie et al., 2014). In contrast, qualitative approaches are generally **interpretivist** in application, emphasising the importance of the lived experience to explore the connections between society and the environment. Knowledge generation is inductive, i.e., 'bottom up' from which theories are then developed.

Factors that influence these philosophical perspectives include the researcher (who may have a particular preference for a particular research method), the researcher's supervisors, research audience, funder and research aims and objectives (Blaikie, 2009, Ritchie et al., 2014). However, it should be noted that viewing the two research paradigms in terms of quantitative and qualitative 'camps' has been criticised because it is an oversimplification of data collection. For example, Blaikie (2009) argues that researchers cannot adopt a purely inductive or deductive approach because we do not approach research studies with complete neutrality. This caution is echoed by Ritchie et al., (2014) who discourage allegiance to one tradition and encourage researchers to draw on difference perspectives, concluding that:

*If researchers are comfortable making an ideological commitment to a particular tradition, regardless of their research topic, then that is their choice, but others should not be forced into a theoretical or methodical straight jacket.*

(Ritchie et al., 2014, p.19.)

However, Clark et al., (2012) reminds us that too often the importance of ontology in the design and evaluation of health behaviour change interventions is ignored, which he argues is peculiar given the influence this has on intervention design

*In healthcare interventions, ontology seems to be thought of as irrelevant or a luxury when compared with attention given to methods, measurement and results. Yet ontology shapes not only these aspects but also questions what research should and can ask.*

(Clark et al., 2012, p. 2.)

Thus, how we as researchers perceive the world will influence our approach to data collection, analysis and interpretation. This makes it pertinent that I clarify my own philosophical research paradigm, which is interpretivism using qualitative research methods. Qualitative research methods are interpretivist in application and emphasise the importance of the lived experience to explore the connections between social, cultural, and environment.

### **5.2.3 Research strategy**

Once research questions are set, a research strategy is required to address them. Blaikie (2009) and Ritchie et al., (2014) present four research strategies: inductive ('bottom up' approaches to data collection where characteristics and patterns are observed and theories are then developed); deductive ('top down' approaches where theory is used to generate a hypothesis which will either be confirmed or rejected); retroductive (discovering reasons for an observed phenomena using models); and abductive (unique to qualitative enquiry, participant language is used to create 'first order concepts' to describe social life). Meaning is then 'abducted' by the researcher who creates categories of explanation called 'second order concepts' (Ritchie et al., 2014, Blaikie, 2009).

Blaikie (2009) notes that choosing a research strategy will depend on the nature of the research questions (e.g., what, why or how) and that it may be necessary to use different strategies for different research questions (Blaikie, 2009). The research questions for this thesis are present in 5.3.1 and are designed to develop a deeper understanding of both the potential and actual extent of message diffusion through peer supporter networks, as well as the context and factors that influence this. In light of this, an **inductive** research strategy with its focus on description of patterns and associations is well placed to answer these questions. However, the research questions also want to say something about why these patterns and associations are observed, so an **abductive** strategy with its focus on developing understanding through focusing on the 'insider' views (i.e., the research participant) rather than imposing a 'top down' researcher perspective is also applicable.

## **5.3 Part 2 - *Doing* empirical research**

Thinking through the philosophical perspectives that underpin the research design is important because it shapes and informs the *doing* of the research, which includes data collection and analysis. Detailed discussion of this is the focus of part 2 which will: clarify the overall research aim and objectives; methods of data collection; sample; recruitment; ethical consideration, informed consent and analytical approach.

### **5.3.1 Research aim and questions**

The overall aim of the study was to examine whether ASSIST has the potential to influence smoking behaviour, attitudes, and knowledge of smoking related harm, beyond the school year.

The following research questions were explored:

1. What do the social networks of ASSIST peer supporters look like?
2. What is the potential extent of message diffusion in peer supporter networks and how does this compare with the actual extent of message diffusion?
3. What factors influence who peer supporters choose to speak to/not speak to about smoking and what are the reasons for this?
4. What is the context in which conversations take place and their content? (e.g., where and how conversations are initiated, what communication methods are used, what is discussed?).
5. How do peer supporters feel about initiating and having informal conversations about smoking?
6. What perceived influence, if any, do peer supporter conversations have on smoking behaviour, attitude and knowledge of social network members?
7. What are the implications and recommendations for any future delivery of ASSIST, specifically, and network intervention science more broadly?
8. What are the methodological contributions to qualitative social network research in general and working with young people in particular?

### **5.3.2 Method**

As noted previously the research questions set out above require an inductive and abductive research strategy. In light of this, qualitative methods, using in-depth interviews, were used.

Before I discuss my approach to conducting the interviews, it is important to consider why I decided this was the most appropriate method instead of focus groups, paired interviews or mini groups. One of the key factors I considered when choosing an appropriate method was conducting research with young people, as well as the importance of research setting.

### 5.3.2.1 *Conducting qualitative research and young people*

Much has been written on the topic of conducting research with young people and whether there are distinct differences to working with an adult population or not (Punch, 2002, Hill, 2006, Tisdall et al., 2008), with Punch noting that,

*There has been a tendency to perceive research with children as one of two extremes: just the same or entirely different from adults. (Punch, 2002, p. 321)*

This is why Tisdall et al., (2008) encourage us to reflect upon our ontological position towards children i.e., What is a child? Both Tisdal et., al (2008) and Punch (2002) note that clarifying your perspective on this before you start fieldwork is important because it will inform the research method. Reflecting on this, my first observation is that I did not see the peer supporters I interviewed as children, but as a diverse group of extremely capable young people (by virtue of the fact that they had the confidence to take on the peer supporter role). However, they were different to adults in that they still needed education, care and support. I therefore approached the fieldwork being acutely aware of my adult, middle-aged status, which could have made it more difficult to establish a rapport as the peer supporter may have compared me to their teachers or parents. In light of this I was, perhaps, more mindful to ensure that peer supporters knew they were not taking part in a test and did not need to take part in the interviews. Further, I was aware that I was more likely to look for cues that my questioning style was clear and non-authoritarian, than if I were interviewing an adult.

In addition to how the researcher perceives children and young people there are five further considerations such as: 1) the research setting (in this case the school); 2) the power imbalance between researcher and young person; 3) choosing an appropriate research method; 4) obtaining informed consent and; 5) the potential for coercion if recruitment is facilitated by a gatekeeper. Points four and five are considered further in the ethics section (5.3.5) and so my focus here is to consider points one, two and three.

The research setting has a considerable influence on the quality of data collected, especially when conducting research in schools. Ideally, the interview would be conducted in a comfortable environment with natural light and comfortable chairs but would also be conducted in a safe place where the young person could speak without fear of interruption from their peers or adults working in the school. A space with minimal noise interference is also desirable to maximise quality of the audio recording and aid transcriptions (Tisdall et al., 2008). These should be considered the 'gold standard' conditions for conducting interviews but they are not always possible to achieve when conducting 'real world' research. This was evidenced by my field notes in which I reflected on the interview environment,

*Interview environment – School 1 better interview space with separate interview room, but still interruptions due to daily prayer and other tannoy announcements. School 2 not a private room for two of the interviews – conducted in staff base with photocopier going and some interruptions. Meant I had to stop interview not great for young person who may have felt uncomfortable with staff coming in and out.*

Field notes 9.8.2016

Next is consideration of the power imbalance between an adult (who is the researcher) and a young person (who is the participant) and the influence this may have on participant response, especially when conducting research in the school setting. For example, the young person may not speak as open and honestly as if they were interviewed in a more neutral environment (e.g., their home); or the young person may want to please the interviewer by telling them what they think they want them to say. As noted by Punch (2002) young people are not equal to adults who maintain control over their lives.

*Children are marginalized in adult-centred society. They experience unequal power relations with adults and much in their lives is controlled and limited by adults* (Punch, 2002, p. 323)

Table 5.1 sets out the range of qualitative methods I considered as well as the advantages and disadvantages of each approach. (Tisdall et al., pp 75-79).

**Table 5.1: Review of different qualitative research methods with young people**

<b>Method</b>	<b>Advantages</b>	<b>Disadvantages</b>
Focus groups or mini groups	<ol style="list-style-type: none"> <li>1. Young people can feel more relaxed and comfortable being with their friends or peers and it may encourage them to contribute to the discussion.</li> <li>2. Can dilute the power imbalance between adult and children as researcher is outnumbered by the young people.</li> <li>3. Can be easier logistically if a pre-existing group already exists.</li> <li>4. Allow consultation with more young people.</li> </ol>	<ol style="list-style-type: none"> <li>1. The group dynamic could result in discussion being dominated by one or two more confident participants.</li> <li>2. Shy members of the group or participants who do not know one another may feel uncomfortable sharing their thoughts and opinions.</li> </ol>
Paired friendship interviews	<ol style="list-style-type: none"> <li>1. As per points 1-4 above and mitigates the disadvantages listed above due to participants already knowing and trusting one another.</li> </ol>	<ol style="list-style-type: none"> <li>1. Small sample size than a focus group or mini group.</li> </ol>
In-depth interviews	<ol style="list-style-type: none"> <li>1. Young person may appreciate the privacy of discussion without their peers or other adults present.</li> <li>2. Allows researcher to be aware of subtle cues and react to signs of discomfort.</li> <li>3. Generates rich and detailed data specific to the individual.</li> </ol>	<ol style="list-style-type: none"> <li>1. Small sample size than a focus group or mini group.</li> <li>2. Young person may feel uncomfortable having one adult present, especially if they had had negative experience face to face interviewing before (e.g., with the police, teachers, social services).</li> <li>3. The power imbalance may result in the young person giving the answers they think they should give.</li> </ol>

Despite focus groups, mini groups or paired friendship interviews allowing for the inclusion of a greater number of peer supporters (and potentially a greater range of opinion and sample diversity) than individual interviews, I chose not to use these methods for three reasons. First, there would not have been enough time to map the social networks for each participant, and also to obtain the additional detail and depth of discussion required. Second, asking young

people to map their social networks alongside their peers raises ethical concerns around how comfortable they would feel mapping their network in the same room as someone else, even if it was their friend (their social network may be small, and they may feel uncomfortable ranking their relationships with another peer present). Last, based on my previous experience of conducting focus groups with this age group, the quality of the discussion can vary greatly depending on who is in the group (e.g., gender and whether they know one another or not), the time of day (low energy levels after lunch) and their motivation to attend the discussion. For example, in a different study I once had a student come along to a focus group discussion to avoid his lesson and sat with his head on the table for most of discussion and contributed very little. For these reasons, I decided that face to face in-depth interviews were the preferred mode of data collection. The following sections will consider the various stages required to plan and conduct them.

#### 5.3.2.2 *In-depth interviews with peer supporters*

A key objective of this thesis was to generate new knowledge about the flow of ASSIST anti-smoking messages beyond the school environment, as well as create a deeper understanding of the context in which this took place. This meant that the interviews with peer supporters had to achieve two things: 1) collect data about their social network and the spread of message diffusion within it and; 2) facilitate discussion to explore the spread of message diffusion and perceptions of the impact this may or may not have had.

I therefore designed a semi-structured topic guide that facilitated collection of social network data (via egocentric sociograms discussed below) but also enabled in-depth qualitative follow-up to unpack and further understand the specific detail in the sociograms. The peer supporter topic guide can be found in Appendix 7. In light of the power imbalance between myself and the peer supporter (discussed above in 5.3.2.1) I was mindful of the importance of establishing a rapport with the peer supporter to make them feel comfortable and at ease. I did this by dressing informally, introducing myself by my first name, telling them about why I was conducting the research and encouraging the peer supporter to tell me a bit about themselves. I also took great care at the start of the interview (and also throughout) to reassure the peer supporter that the interview would be fun and informal and that it was not a test. I emphasised that my only objective to hear their thoughts and opinions which would be completely confidential (unless they told me something that concerned me for their own safety or that of someone else). The next two sections will explain in more detail the two parts of the interview – part one creating sociograms and part two qualitative follow-up.

### 5.3.2.3 *Egocentric sociograms*

Peer supporters in the study were asked to map their social networks using egocentric sociograms. Mapping such as this is common in network science and is generated through a 'name generation question', which has been used since the 1960s (Hogan et al., 2007). (Borgatti, 2013) describes the three stages involved. First, is '**name generation**' where participants (referred to as 'egos') are asked a question to prompt a list of names (also referred as 'alters'). Careful thought was required to choose the correct name generation question as it could have been interpreted in different ways, which may have generated different types of data. For example, Borgatti (2013) summarises four types of name generator questions:

1. Role-based relationships (e.g., friends, family) - name five people that you consider a friend?
2. Interactions – (e.g., people we have spoken to) who are the people you have spoken to about a work or school matter?
3. Affective, (e.g., likes and dislikes) - who are the people in your office/school/university that you feel particularly close to?
4. Exchange and flows (e.g., source of support/help) who are the people who would give you financial support if you needed it?

The existing social network research evidence base lacks guidance on using name generation questions with young people to generate qualitative data (making a contribution to address this evidence gap is one objective of Chapter Six). This is mostly a reflection of there being very few studies that have conducted egocentric mapping with children or young people. Of those which have, such as Samuelsson et al., (2016) there is no discussion of why the name generation question was chosen or whether it was piloted with children first in order to understand how the question was interpreted.

I, therefore, drew on my previous research where I conducted egocentric sociograms with a cohort of adult gamblers. The methods used for the study are described elsewhere (Dobbie et al., 2017), but I used the same concept of using concentric circles to collect network data and then draw on the sociograms to prompt further detail via qualitative discussion. The name generation question for the gambling research was "*please think about the important people in your life right now?*" This worked well with adults, but I was concerned that it was not clear enough for peer supporter to interpret easily. In particular, young people might be unsure how to interpret the term 'important people'. I was also cognisant of the limited time I had to conduct the interviews (around 50 minutes) so I did not want peer supporters to get distracted by trying to figure out the parameters of the name generation question and potentially list several

names. I, therefore, decided to simplify the question to *'please think about the people you feel close to'*? Piloting the use of this name generation with young people was one of the objectives of this thesis, with findings presented in Chapter Six.

Stage two, is *'name interpretation'*, where egos are asked for further detail on the list of alters generated from this stage called 'alter attributes' e.g., age, gender, employment status etc. Borgatti notes that because these characteristics come from the ego (i.e., the individual who generated the list of names) they are based on the ego's perception of the alter and could be inaccurate or flawed, however, this will depend on the nature of the detail required and the strength of the relationship between ego and alter. For example, if a peer supporter was asked the age of an alter who was also their friend or sibling, they could be confident in their answer, whereas they may be less confident if it was parent or grandparent whose age they may not now. Again, the accuracy of the name interpreter stage will depend on the name generation questions asked to generate the list of alters.

The third and final stage is *'name interrelaters'* where the respondent is asked about the ties within their network i.e., which alters know one another also called 'alter - alter ties.' This is used in social network analysis to measure things like network density (the number of connections in a network) and centrality (identifying key influencers in the network). Borgatti (2013) describes this stage as optional because it can be extremely time consuming for the participant and is dependent on the ego having knowledge of the ties between their alters which may be limited. For example, Borgatti (2013) illustrates the propensity for 'respondent fatigue' when asked to list all their alter-alter ties, with the example of an ego with 50 alters in their network which has the potential to report on 1225 ties. One approach to mitigate this burden is to cap the number of ties alters would have to identify, but the obvious limitation is that the data will be unrepresentative of the entire ego network. A more pragmatic approach is to select a random sample of alters which will be more manageable. This level of detail is not included in my thesis because it was not directly relevant to the research questions set out in 5.3.1.

#### 5.3.2.4 *Concentric circles*

Peer supporter sociograms were created using 'concentric circles' - a hierarchical mapping technique (Antonucci, 1986). Creating the maps was a very simple process consisting of two steps: first, peer supporters were given a blank piece of paper with four concentric circles and asked to write their name in the smallest circle in the centre. Using the following name

generation question – *please think about the people you feel close to* - they were asked to list members of their network and then place them onto the map in order of closeness – i.e., those who they felt closest were in the inner circles, with those ranked less close placed in the outer circles. As noted above, Chapter Six will critically reflect on the sociogram making process but will also offer insight into how the name generation question was interpreted by peer supporters. In line with similar studies which have used sociograms there was no limit on the number of alters that could be included, (Heath et al., 2009a, Ryan et al., 2014). Each member of the network (called ‘alters’) was represented with a post-it to which additional information was added such as: the nature of the relationship to the peer supporter; their age; smoking status and frequency of contact. An example sociogram is given in 6.2.2.2.

### 5.3.2.5 *Qualitative exploration*

Once sociograms were created, they were used as a tool to facilitate discussion about whom peer supporters had spoken to as a result of their ASSIST training and to generate a sample list for alter interviews (discussed further in 5.3.2.6). An extension to the sociogram making process was the addition of coloured dots, which to the best of my knowledge had not been done with young people before. Red dots were added to each post-it note to identify whom on their map they had spoken to about smoking and blue dots identified individuals who they thought the conversation had some sort of influence on in terms of smoking behaviour, attitudes or knowledge. Lastly, green dots were used to identify people peer supporters thought would be willing to take part in a face to face or telephone interview (discussed further below). The use of coloured dots provided a clear visual representation of maps allowing the peer supporter to see their network and think about whom they had spoken to specifically about smoking. Once the sociograms were completed they were used to facilitate further discussion of the following key areas:

1. Why did peer supporters decide to talk to some people on their sociogram about smoking and not others?
2. How did peer supporters communicate with people on their sociogram about smoking? (e.g., mode of communication: face to face, social media, text, phone)
3. What did they discuss in relation to smoking?
4. What was the perceived influence (if any) of these interactions on smoking behaviour, attitudes and knowledge?

Incorporating sociograms into qualitative interviews is not new, but the addition of coloured dots is, and I could not find any prior examples of this approach being used with young people. The addition of the dots introduced a visual aspect to the sociograms where it was immediately obvious who peer supporters had spoken to and who they perceived their conversations had made some kind of influence. The merits of this novel and new methodological approach to data collection with young people and sample generation are considered in detail in Chapter Six.

#### 5.3.2.6 *Alter interviews*

As noted by Crossley et al., (2015) one of the criticisms of conducting interviews with peers supporters ('egos') and asking for their perception of influence on the people they spoke to (i.e., alters) is the reliance on the ego interpretation of influence and recall of the conversation. Peer supporter interviews, therefore lacked alters' voices, which is why I included provision to conduct 12-15 alter face to face or telephone interviews. The topic guide for these interviews is found in Appendix Eight. In these interviews I was interested in exploring alter thoughts and perceptions of ASSIST and what perceived influence (if any) discussions with peer supporters had on their attitudes and knowledge towards smoking, and if appropriate their own smoking behaviour. These accounts could then be compared with peer supporter interpretation and furthers understanding about the acceptability and potential influence, of extended message diffusion. Reflecting on the content of the topic guide consultation with alters could also have been conducted via a focus group discussion (the content of the topic guide was not particularly sensitive, and views and opinions could have been richer and more informed though discussion). However, as I did not know who would volunteer to take part (e.g., in terms of age, gender, employment status etc., which can influence the group dynamic of a focus group discussion), I decided that one to one interviews would be more appropriate. Further, I anticipated that recruitment would be challenging (discussed further in in 5.3.4.2) and one to one interviews would have enabled me to be more responsive and flexible in terms of appointment times. This might have made it more likely that I would have been able to secure a productive interview.

### 5.3.3 **Sample**

Samples for qualitative research studies are not large enough to generalise to the population of interest (if it this is the intention then a quantitative design would be required). Rather, the benefit of qualitative studies is the opportunity to generate deeper meaning and understanding

of the phenomena of interest through a sample with enough range and diversity to capture a variety of views and opinion. As noted by Ritchie et al., (2014)

*Statements about incidence or prevalence are not the concern of qualitative research. There is therefore no requirement to ensure that the sample is of sufficient scale to provide estimates, or to determine statically significant discriminatory variables*  
(Ritchie et al., 2014, p. 117)

They further note that a fine balance is required between having a sample size that is large enough to generate new evidence, but not so large that the analyst is prevented from conducting a robust and detailed analysis. Their final point is to recognise how highly resource intensive conducting qualitative research is, concluding that it would

*....simply be unmanageable to conduct and analyse hundreds of interviews, observations, or groups unless the researcher intends to spend several years doing so.*  
(Ritchie et al., 2014, p. 117)

Ultimately, the thorny issue of an adequate sample size for qualitative studies will depend on several factors such as the heterogeneity of the population of interest – the more diverse this is the more the researcher needs to understand the variants within it and seek to have them represented in their sample. This often results in a larger sample. Conversely the more homogeneous the population is the smaller the sample. Next, is consideration of any special interest groups that require deeper study, with representation from these groups perhaps needing to be boosted resulting in a larger overall sample. The last two considerations are more pragmatic. For example, choice of research method will influence the size of the sample – focus groups will yield a larger sample than one to one in-depth interviews. Finally, and perhaps of most importance, is the budget available and timescale for the research study as both of these factors will influence the size of the sample that is possible to achieve. Thus, having considered the factors that influence qualitative sampling I will now explain the sample rationale for this study.

The research questions set out in 5.3.1 pointed to two key groups, peer supporters and members of their social network. Taking cognisance of the sampling criteria discussed above I had originally planned to consult with 10 peer supporters and then conduct interviews with 15 members of their social networks. I decided on these numbers because the sample of peer supporters was relatively homogenous in that they were all non-smokers, aged between 12 and 13 years who attended school. Alters on the hand, were potentially more heterogenous

in terms of different age, smoking and employment status and ethnic group. For this reason, I decided that more alter interviews were required. If these target number of interviews were met this would have resulted in a total of 20-25 interviews and transcripts. Both data collection and analysis would have been manageable within the budget and time constraints of this thesis.

To ensure the required range and diversity of opinion was included, a purposive quota sampling frame was used with the recruitment criteria presented in Table 5.2. Attempting to interview members of peer supporter social networks was novel and required the use of respondent driven sampling (discussed further below) which typically results in lower uptake. In light of this, I did not set any sampling criteria for the alters and decided to see who volunteered to take part. The only recruitment criterion was that social network participants had to be aged 16 or older. If they were younger they would have needed permission from a parent / carer to take part which would have made opt-in harder. In Chapter Nine I reflect on whether this was a limitation of the study or not. I had hoped to have interest from a range of social network participations e.g., parents, aunts, uncles, siblings (aged 16 or over), and extended family members. If I was in the fortunate position of having more volunteers than I needed, I planned to set retrospective sample quotas to aid sample selection.

Table 5.2 also indicates that the actual number of participants for peer supporter interview exceeded that of the accepted tolerances and that the number of alter interviews was zero. Reasons for this are discussed in more depth in Chapter Six (section 6.2.5) but, in summary, the alter recruitment method failed – peer supporters did not nominate enough alters and the ethical requirement for alters to opt-in (discussed further in 5.3.4.2) precluded their participation. This meant I had additional resources to increase the number of peer supporter interviews to 16 (eight from each school) and enabled greater exploration of message diffusion beyond the school year.

Table 5.2 also highlights the sample diversity in terms of school, ethnicity and gender (although slightly more females were recruited than males) which qualitative samples strive for. In addition to this demographic detail students also spoke briefly about the environment in which they lived and their hobbies and interests. Students tended to live locally and were able to walk to school or take a short bus ride of 15-20 minutes. Others lived further away which required a commute of 30 minutes or longer. Country of origin for most students was Scotland but for others they moved to Scotland from Africa and Eastern Europe. It was not appropriate/necessary to ask why they had settled in Scotland but one of the schools was located in an area with asylum seeker, refugee and immigrant populations. Across both

schools, hobbies and interests were gendered with girls interested in: cheer leading, dancing (ballet, tap, hip-hop, contemporary, freestyle modern), listening to music, playing a musical instrument, drawing, reading, athletics, talking on the phone, going to the beach and park, gymnastics, shopping, drama, chilling, riding a bike. Whereas boys mentioned racing (type not specified), playing computer games, watching TV, sports, brain exercise (e.g., quizzes), sleeping and playing football. The only exception was 'hanging out with friends' which applied to both girls and boys. All participants reported that they did not smoke and had never tried a cigarette, not even a puff.

**Table 5.2: Sample characteristics**

Recruitment criteria		Ideal number of participants	Accepted tolerances		Actual number of participants
			Minimum number of participants	Maximum number of participants	
<b>Peer supporters</b>					
School	School 1	5	4	6	8
	School 2	5	4	6	8
School year	S2	10	10	10	16
Age	13-14	10	10	10	16
Gender	Female	5	3	7	10
	Male	5	3	7	6
Ethnicity	Mixed/Multiple ethnic groups, Asian/Asian British, Black/African/Caribbean/Black British, Other ethnic group	3	2	5	9
	White	7	5	8	7
<b>Members of peer supporter social network</b>					
N/A	N/A	12	8	15	0

### **5.3.4 Recruitment and informed consent**

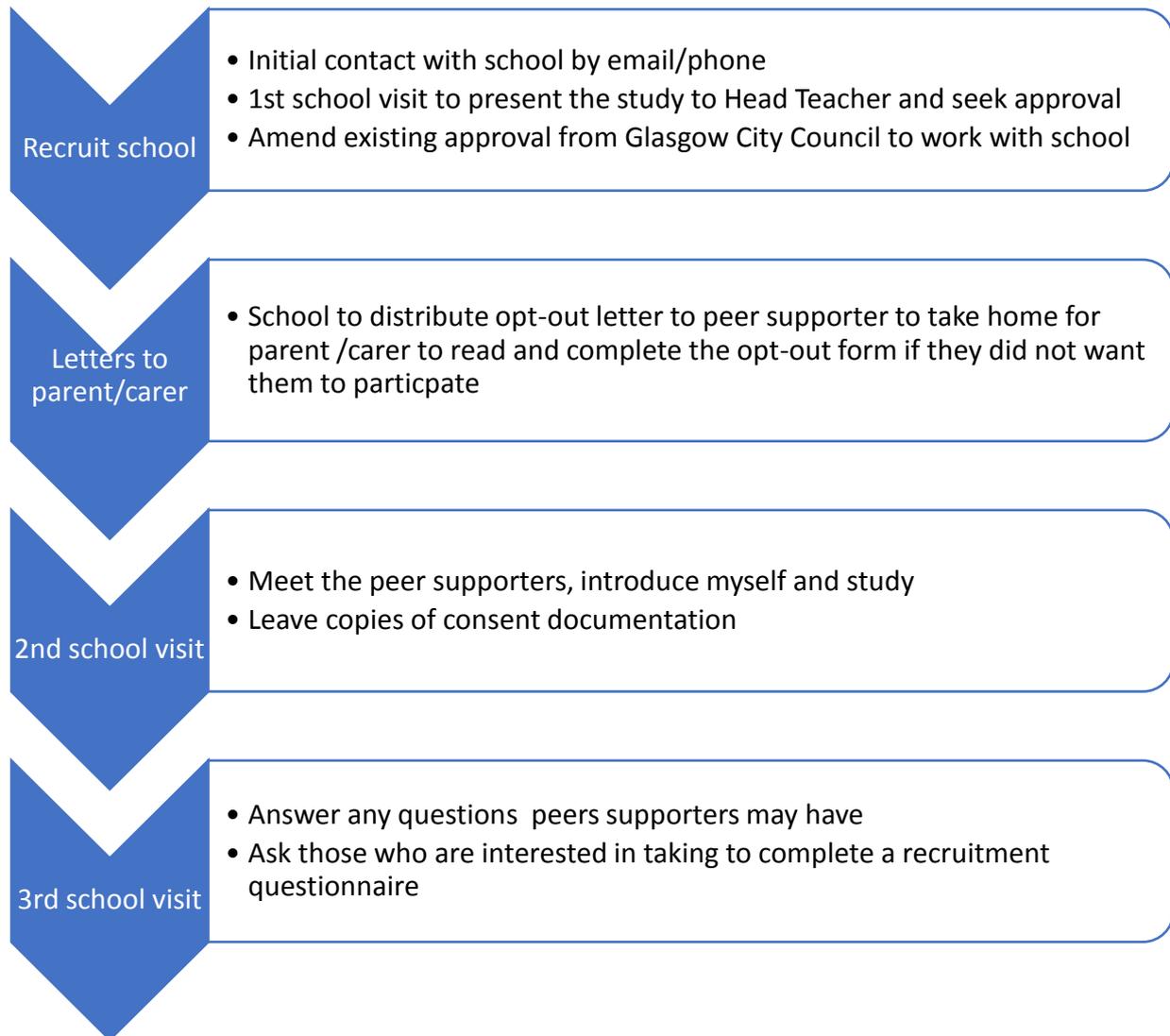
#### *5.3.4.1 Peer supporters*

The recruitment process is summarised in Figure 5.2, but before this is described it is important to clarify why I wanted to recruit from two schools and not just one. There were four reasons for this. First, it made the request for support from the school much more limited and manageable. By asking one school to find a quiet space to conduct interviews and allow five students to leave their class to take part was easier than asking for 10. Second, recruiting two schools instead of one offered the reassurance that if one school was unable to support recruitment of the target number of students, I had another school to draw on (something that proved vital when I decided to boost the number of peer supporter interviews from 10 to 16). Third, despite both schools being part of Glasgow City Local Authority they were situated in different locations of the city, with different school populations. For example, despite both schools being large and able to accommodate a total of 950 students, school one was located in the north east of Glasgow with a larger black and minority ethnic population and asylum seeker and refugee population than school two which was located in the south of city. I was therefore keen to include both schools to capture as much diversity as possible, which is reflected in the ethnic diversity of peer supporters shown in table 5.2. The last reason was opportunity. Having worked with both schools as part of the ASSIST Scotland process evaluation (Dobbie et al., 2019), I had already built a rapport with the school and this undoubtedly made the approval process easier. Something I reflect on further in Chapter Nine.

As illustrated in Figure 5.2 the recruitment and consent process comprised of four stages. First, I contacted the school and arranged a face to face meeting with Head/Deputy Head Teacher to present the study, seek their co-operation and talk through the fieldwork logistics. The next stage was to notify the peer supporter's parent/guardian by way of an information letter which described what was involved and gave them the opportunity to withdraw their child from the study within a 10-day period (please see Appendix nine). Distribution of this leaflet was via the school lead. Then I visited the schools and met all of the peer supporters who were present at the follow-up session as part of the ASSIST programme. Face to face delivery of this stage was crucial to start to build rapport and answer any questions students may have regarding the purpose of the research and what their participation would involve. Copies of the information sheet and consent form (Appendix 10) were given to the young person to review and I returned at the next follow-up session (around seven to 10 days later) to recruit young people to the study and arrange a suitable time for interview during school hours. Peer

supporters who expressed an interest in taking part were asked to complete a recruitment questionnaire (Appendix 11) to collect demographic detail and information on the number of conversations they had and with whom. Written informed consent (Appendix 10) was obtained from each peer supporter prior to commencement of their interview.

**Figures 5.2: Summary of recruitment process**



#### 5.3.4.2 *Alter recruitment*

In order to comply with data protection legislation and obtain ethical approval potential ‘alters’ (i.e., members of the peer supporter network who were identified by peer supporters as potentially willing to take part in an interview) had to ‘opt-in’. This meant peer supporters could nominate names of people in their networks but not share their contact details with me because they did not have their consent to do so. Peer supporters were, therefore, provided

with 'opt-in' invites (Appendix 12) which contained a study information leaflet, consent form and a reply-paid envelope, which could be returned by post. The benefit of this approach was that it mitigated coercion (as the ego will not know who took part unless the alter decides to share this information). However, the downside is it relied on the peer supporter being motivated to pass on the interview invitation and then the alter being motivated to opt-in. Despite offering a £10 voucher to encourage response, unfortunately none of the peer supporter alters opted-in for interview and this part of the study was unable to proceed as planned. Chapter Six considers this in more detail, suggesting potential explanations and lessons learned from piloting this novel recruitment approach.

### **5.3.5 Ethics**

As in other studies, care was required to consider whether the research proposed could have unduly caused any upset or harm and put strategies in place to mitigate this. To ensure this is given the necessary scrutiny approval is required by an independent ethical review committee. For this study approval was granted by the School of Health Sciences Research Ethics Committee from the University of Stirling on 10<sup>th</sup> March 2016. In preparation for my ethics submission I identified three ethical concerns which I discuss here, along with my solutions to address each issue.

#### *5.3.5.1 Thank you payments for young people under 16*

It is not uncommon in qualitative research to offer a small incentive or 'thank you payment' to acknowledge participants' time and contribution. However, at the time when I was planning my fieldwork (2016) guidance on the ethical implications of doing this in a school setting was sparse and unclear. The most useful guidelines came from the Market Research Society, which stated that if a voucher was given to children, parents or guardians should be informed, which suggested that this approach was acceptable. However, the Association for Research Ethics stated that:

*Payments to children can be considered to be an unethical inducement especially if in cash.*  
<http://arec.org.uk/policy-and-guidance/guidelines-library/> (last accessed 22.1.16)

This quote is ambiguous because it does not explicitly say that payment was unethical. I would also argue that it could be considered unfair to give an adult a voucher to acknowledge their

participation and not a peer supporter. In the end I decided to discuss the matter with the school and take their lead. Both were happy for the young people to receive a £10 Amazon voucher to thank them for their time. Each school also received a £50 Amazon voucher for schools funds to thank them for their support.

#### 5.3.5.2 *Coercion*

As with any study with human participants, recruitment approaches need careful thought – especially if the sample was to be accessed via a gate keeper as was the case for this study (i.e., peer supporters were accessed via the school and potential alters identified by the peer supporter). The concern with this approach is that participants may feel they have to take part because they have been nominated by someone else (especially if that person is an authority figure like a teacher or a friend or family member). The recruitment process outlined in the previous section (5.3.4) was designed to minimise any feelings of coercion or pressure to take part. For example, access to peer supporters was facilitated via the school lead and ASSIST trainers but they did not approach them to take part – I did this by visiting each school twice to conduct recruitment (see Figure 5.2). Access to members of the peer supporter’s social networks was facilitated via the peer supporter using ‘respondent driven recruitment’ (also known as ‘snowballing’). This relied on the peer supporter passing on information about the study to members of their network who then ‘opt-in.

#### 5.3.5.3 *Confidentially and disclosure*

With any interview there is a small risk that the participant may disclose information that would make the researcher concerned for their safety or for that of someone else. This is especially pertinent for research with young people where they will be asked to talk about the people they feel close to. Interviews were not concerned with why peer supporters felt close to the people they nominated and so it was not anticipated that interviews would generate any potentially sensitive discussions. However, it was made clear during the informed consent process and before the interview took place that participants could refuse to answer any questions they wish and terminate the interview at any time (with no reason necessary). It was also clearly articulated that everything the participant said was confidential unless they told me something that caused me concern for their own safety or that of someone else.

A further important consideration is that young people may not want to talk about their social network for a variety of reasons (their network may not be very big, they may have a chaotic

family life, they be could living with a foster family, have suffered a recent family trauma e.g., bereavement, divorce). During the recruitment process peer supporters were reassured that taking part in the study was entirely voluntary and if they did not want to take part this would not affect the role as a peer supporter for ASSIST. It was also made clear that they choose whom to add to their sociograms and if they did not want to answer any questions or speak about certain people on their maps they did not need to.

#### 5.3.5.4 *Who gives consent?*

If this study was a clinical trial involving an intervention, young people aged under 16 would not commonly be required to give their consent. Instead, this would be required from their parent or legal representative (e.g., foster carer, guardian) and the young person would also be asked for their 'assent' to take part. <http://www.hra-decisiontools.org.uk/consent/principles-children-Scotland.html> (accessed 29.12.15)

However, for a qualitative research study such as this, the process is more complex because there are no specific legal requirements to conduct research with young people aged 11-13, as noted by the Health Research Authority (HRA)

*There is no specific provision in Scots law governing a child's right to consent to take part in research, other than a Clinical Trial of an Investigational Medicinal Product (CTIMP), i.e., consent for non-CTIMPs.*

<http://www.hra-decisiontools.org.uk/consent/principles-children-Scotland.html>

(accessed 29.12.15)

The Health Research Authority also note that a child's ability to give informed consent will be dependent on their capacity to understand what their contribution will involve which is generally considered to be from the age of 12. Their capacity will be influenced by the quality of the information presented to them and language used is a key consideration. This meant the process to obtain informed consent was confusing and it was not clear whether student consent was enough or whether consent was also required from their parent or carer also. In light of this, I decided that the best approach was to be consistent with that for clinical research and as described in section 5.3.4.1 parent/carers were given the option to withdraw their child from the study, i.e., 'opt-out.'

### 5.3.6 Analysis

All interviews were recorded and transcribed verbatim by a professional transcriber rather than by the researcher. Immediately after each interview an observation sheet was completed to record initial observations and points of interest for context and analysis. This was combined into a master observation document which was discussed with supervisors and informed the coding frame which is discussed further below. Peer supporter interviews generated two types of data for analysis: individual sociograms visually displaying peer supporter social networks; and a qualitative narrative that ran alongside the sociograms capturing data in relation to message diffusion beyond school year peers.

#### 5.3.6.1 *Qualitative analysis of peer supporter narratives*

Transcripts were analysed using thematic analysis, which involved reading and re-reading transcripts to identify patterns, associations or meaning, which are then ordered into higher level themes and sub-themes (Ritchie et al., 2014, Braun and Clarke, 2006). Ritchie et al (2014) note that some authors have argued that thematic analysis is a generic approach used across different types of analytical theory (such as grounded theory, interpretative phenomenological analysis) rather than an approach in its own right. However, with the ontological perspective for this thesis situated in critical realism, thematic analysis was a good fit because it enabled inductive and abductive data extraction from the research participant's perspective, not the analyst (Silverman, 2014).

The first stage in thematic analysis is data management, where the objective is to make sense of the data through a process of sorting and coding. This creates a platform for movement beyond what Braun and Clarke (2006) refer to as the 'surface of the data' (i.e., descriptive analysis) and into interpretive analysis. I conducted this process of data management using 'Framework', developed by the National Centre for Social Research in the 1980s (Ritchie et al., 2014). First, I identified the key topics and issues which emerged from the data through familiarisation (i.e., reading of transcripts and observation records). This ensured that my next stage - creating a thematic framework to code the transcripts was grounded in the data. My coding framework (see Appendix 13) was informed by the transcripts, observation records, research questions and topic guide. Once I had created a coding frame I piloted it with two transcripts (I used paper copies of the transcript and applied my coding frame using a pencil which allowed for further refinement as required). Once the final coding frame was agreed (with my supervisors) I commenced stage three of the data management process where I

indexed and sorted my data using NVivo 11 (a computer-assisted qualitative data analysis software package (CAQDAS)). This meant taking each transcript and applying labels to chunks of data, also referred to as 'coding.'

Framework adds an additional step to data management - 'data summary and display'. This requires the analyst to write a summary of each piece of coded text, which can be displayed by theme and case in a set of matrices. This last stage of data management is time consuming and laborious, which some researchers do not include (Ritchie et al., 2014).

Having previously conducted data summarisation for other research projects I knew how time consuming this process was. However, I also knew how valuable it was to condense the volume of the data and build a thematic analysis that was truly grounded in the data. Rather than summarise solely in Framework (which can be difficult to view and edit) I chose to conduct this using word because I found his easier to work with than Framework.

Once I had ordered the data using Framework I then moved onto the final phase of abstraction and interpretation where key findings were drawn out to answer the research questions set out in section 5.3.1. This started with description, where inductive logic was applied with the key focus being 'what' questions – i.e., what was the potential and actual extent of message diffusion within peer supporter social networks? This then lead onto more analytic 'abductive' approach where I sought to explain the context in which smoking conversations took place (e.g., why peer supporters choose to speak to some people and not others; how they set about initiating a conversation, as well as where and when conversations took place) and content (e.g., what did they talk about, what was the perceived outcome, how did they feel after the conversation?).

In practice my approach to data abstraction and analysis can be summarised into two stages. First, I copied all of the coded data for each theme (i.e., verbatim transcript text which I coded in NVivo) into one master word document which I called '*all coded data*'. As would be expected this document was dense with 324 pages. I then created a second excel document – 'data abstraction and generating themes' where I abstracted and summarised key findings from the '*all coded data*' document the create my thematic analysis. This involved four steps and illustrated via a worked example for perceptions of influence presented in Appendix 14.

### 5.3.6.2 *Social Network analysis of peer supporter social networks*

Chapter Four introduced the reader to social network research and outlined the different methods to collect and analyse network data. Four approaches were discussed, and I highlighted the particular relevance of approach three and considered how it could be incorporated into my research design. After conducting this review, I decided that I was conducting a *qualitative study using a mixed method analytical approach.*'

In practice this meant that data was collected qualitatively with no separate collection of formal network data via a survey, for example. Instead, collection of network data was incorporated into the interview via sociograms (see 5.3.2 for more detail). This enabled a mixed method analytical approach with both quantitative and qualitative findings presented in Chapters Seven and Eight.

My approach to analysing social network data collected from the sociograms was twofold. First, I created an excel spreadsheet to enter the data collected from the sociograms. This included detail on the peer supporter (ego) ID and gender and information for each alter added to the map by the peer supporter. For each alter the following detail was added: alter ID, gender; age; employment/school status; relationship to peer supporter; frequency of contact with peer supporter; mode of communications with peer supporter; smoking status; placement on sociogram and; whether they had been given a red, blue or green dot. Once the excel spreadsheet was complete I created bar charts and figures to illustrate the potential and actual extent of message diffusion which is described in detail in Chapter Eight.

## **5.4 Summary**

This chapter has outlined the different elements of my empirical research to explore the extent of ASSIST message diffusion beyond the peer supporter school year. This included consideration of: working with young people; the most appropriate research method; ethics; sample and analytical approach. Informed by the literature from the previous chapters the aim of my research study was to examine whether ASSIST has the potential to influence smoking behaviour, attitudes, and knowledge of smoking related harm, beyond the school year.

After reviewing approaches to the conduct of social network research, I decided to use a qualitative study design, with a mixed method analytical approach, in order to address these research questions. Data were collected using in-depth face to face interviews but were

analysed using both quantitative and qualitative methods. I developed a new and innovative approach using sociograms and coloured dots to collect peer supporter social network data, with a deeper understanding of context and content of message diffusion acquired through face-to-face qualitative interviews.

Sixteen interviews were conducted with peer supporters from two schools located in deprived areas in Glasgow City, with sample diversity achieved in terms of gender and ethnicity. Analysis was conducted using Microsoft excel to develop an understanding of the potential and actual extent of message diffusion beyond the school setting (discussed in Chapter Seven). Qualitative data were analysed using thematic analysis with inductive and abductive approaches to extracting meaning from participant transcripts (discussed in Chapter Eight), which is consistent with my ontological perspective of critical realism.

Findings from this empirical study are discussed in three results chapters the first of which (Chapter Six) will critically reflect on the novel research method developed to collect social network and qualitative data from young people (the names of you people have been changed to protect their identity).

# Chapter 6: Making sociograms

## 6.1 Introduction

As we have seen from Chapter Four, social network research (SNR) has been criticised for its propensity to use ‘formal’ (quantitative) methods (Tubaro et al., 2016a, Bellotti, 2015). Despite some growth in qualitative SNR, it still remains poorly represented in comparison to quantitative SNR, with even less methodological detail in terms of how the data was collected analysed qualitatively. In this thesis sociograms were created using concentric circles with additional detail captured using post-it notes and coloured dots. Using sociograms to generate social network data or to serve as a prompt for greater depth of understanding in qualitative interviews with adults is not new (Ryan, 2011b, Ryan et al., 2014, Heath et al., 2009a, Bellotti, 2016). However, a search of the literature suggests that this specific approach of using coloured sticky dots to identify networks members and subsequently prompt for further discussion, has been used previously with adults but not with children (Dobbie et al., 2017). In this chapter I will critically reflect on the application of the chosen method of data collection (i.e., creating egocentric sociograms with qualitative follow-up using coloured dots) in adolescents.

## 6.2 Reflection on research method

As noted above, this chapter is concerned with the often complex and multifactorial process of constructing sociograms using post-it notes and coloured dots with adolescents. Reflections on using this novel method are presented under five themes: 1) name generation; 2) cognitive processes associated with building sociograms; 3) peer supporter views of making sociograms; 4) using post-it notes and coloured dots; 5) environmental and practical considerations associated with creating sociograms. The last section switches focus to critically reflect on using the approach as a recruitment tool for follow-up interviews with alters, which as noted the previous chapter was unsuccessful.

### 6.2.1 Name generation

This first section focuses on name generation, specifically the name generation question that was used to populate peer supporter sociograms. I will consider this from two perspectives:

1) how peer supporters interpreted the primary name generation question (NGQ); and 2) generating further nominations through the use of secondary NGQs.

### 6.2.1.1 *Peer supporter interpretation of the primary NGQ*

The importance of choosing an appropriate NGQ was noted in the methods chapter (5.3.2.3), as well as acknowledging the lack of literature offering methodological guidance on how to craft a name generation question that was suitable for young people. In light of this, the decision to start with the primary name generation question – *‘please think about the people you feel close to’* - was mainly pragmatic. It is one of the most commonly used questions to generate a list of role-based relationships and has been used in previous studies (Borgatti, 2013). However, studies that report using this question tend to be adult population based and lack reflection or discussion about how participants interpreted the name generation question or what it meant to them. This is less than ideal, as social network researchers caution against failing to give due care and consideration to the name generation question because it will influence which names are nominated. Different NGQs will generate different lists of alters, which will then influence interpretation of these data. For example, *who do you speak to on a daily basis?* could generate a large list of people (alters) who are neighbours, friends, family members, works colleagues etc. However, a NGQ that ask *who do you discuss important matters with?* could generate a different list of names that may be smaller. This will impact interpretation of the data collected, e.g., size of the network.

In an effort to help fill this evidence gap, i.e., the lack of methodical guidance on how to create a suitable qualitative name generation question for adolescents, peer supporters were asked to think specifically about what the phrase *‘people you feel close to’* meant to them. Before discussing the different ways this NGQ was interpreted by the peer supporters, it is important to clarify that when I designed the topic guide my expectation was that this single NGQ would generate enough data to answer the research questions for this thesis. However, as will become clearer in later sections of this Chapter (6.2.1.3), this proved not to be the case, with additional (secondary) NGQs required. This is an important learning point for future researchers to consider if they plan to use a similar method of data collection and is something I reflect on further in Chapter Nine.

Analysis of peer supporter narratives suggested that the primary NGQ was interpreted in three ways. First, was having a physical presence, i.e., seeing the person every day. Second, was having an emotional connection, for example this was described by one participant as

someone who made them smile. Third, was knowing they could share their secrets (and have the confidence that they would be kept a secret), but also a belief that the person would always be there for them, would not intentionally hurt them and would help them if they were having a difficult time or needed guidance or advice. But above all, as shown in the quote below, qualities of trust and dependency were paramount.

*“Someone I can tell my secrets to, and someone I can really trust a lot, if it was just like a normal friend then sometimes you don’t trust them a wee bit, there’s always that one friend or one family member you can trust the most and you can tell your secrets to.”* (Michelle)

*“And like...um...knowing that they won’t hurt me on purpose.”* (Zarina)

#### 6.2.1.2 Definition vs reality

The brief discussion above demonstrated a descriptive perspective of what closeness meant to peer supporters. However, further analysis highlighted a disconnect between how participants defined closeness and who they added to their sociograms – i.e., definitions of what closeness meant did not always match their rationale for deciding who to add to their sociogram. For example, Louise chose not to add her younger sibling to her sociogram. Despite meeting the closeness criteria discussed above in terms of a physical and emotional connection, this peer supporter felt her sibling was too young to share her emotional problems with and therefore was not added to her sociogram.

*Interviewer: You’ve got a wee sister as well. So she’s not on your map at the moment. Is there a particular reason for that?*

*Participant: We fight like cat and dog. Of course I love her. She’s my wee sister and I do feel close to her, it’s just that she’s not old enough to understand yet. If I’ve boy problems or whatever, I can’t go to my wee sister.* (Louise)

The same participant also decided not to add her father to her sociogram, again this was not because she did not feel close to him, but because she felt closer to her mother who she would confide in.

*Interviewer: So you mentioned your dad there. He's not on your map. Is there any particular reason?"*

*Participant: I am close to him, but it's just like – obviously I trust him and I love him, but I'm not as close to him as I am with my mum. Things I can tell my mum, I can't tell my dad.* (Louise)

A final example comes from Michael who chose not to add his mother to his sociogram. When probed it was clear that she met the closeness criteria by virtue of her being his mother, but this was not enough to entitle her to be added to his sociogram.

*I do feel close to her just because like she's my mum and usually...I like her, but it's like sometimes she's annoying.* (Michael)

These examples suggest that despite feeling close to these family members they were not necessarily people they would confide in if they had a worry or concern either because they were too young to offer advice or because there were other people they would prefer to seek counsel from. They also point to the dominant criteria for defining closeness being centred on feeling able to confide in the person, rather than having a physical presence or family tie.

Finally, the above examples also highlight the importance of the NGQ – the young people clearly understood the primary NGQ and demonstrated maturity and a clear rationale for who they decided to add to their sociogram. However, it also narrowed the list of names they could add to the people who they conceptualised as being close to. This meant that other people who they may have engaged in conversation with about smoking, but did not feel especially close to, were missed. This is why secondary NGQs were crucial to ensure sociograms contained a fully comprehensive list of people peer supporters could have spoken to about smoking.

### 6.2.1.3 Secondary Name Generation Questions

As noted previously, my expectation when I designed the topic guide was that just one NGQ - *please think about the people you feel close to* - would be sufficient to capture the level of detail I was aiming to collect. However, during the first few interviews it quickly became apparent that it was not. The reason for this is that one of the key objectives of my thesis was to capture both the *potential* and *actual* extent of message diffusion. Therefore, it was

important that peer supporters nominated all of the potential people who they could engage in a conversation about smoking as a result of taking part in ASSIST. Relying on the primary NGQ which asked peers supporters to reflect on who they felt close to would not have generated a comprehensive list of alters. This meant it was necessary to add secondary NGQs to prompt the peer supporter to think about other people who they initiated a smoking conversation with. These questions were essentially probes for 'anyone else', with some examples listed below:

*So have you spoken to anybody else in S2, anybody else in your year group?*

*So let's think anybody else that you've had a conversation with about smoking has there been anybody else?*

*So...I want you to think now about any other conversations you've had with anybody else about smoking since you've been part of the ASSIST programme, can you think of any other conversations that you've had with anyone, anybody in S2, anybody not in S2, any other friends or family members?*

Thus, the sociograms created could be viewed as 'hybrid' sociograms which consisted of one set of alters who were added because the peer supporters felt close to them, and a second set which were added because the peer supporter had engaged them in a conversation about smoking but were not necessarily people they felt close to. Due to the fact that this hybrid approach evolved after fieldwork had started, I did not include a mechanism to distinguish between these different types of nominations (e.g., adding another coloured dot). However, as peer supporters were asked to rank all of their nominated alters by level of closeness on their sociogram, the variation in how the list of names (alters) was actually compiled is less important.

However, it does raise an important question around why the primary NGQ had a particular focus on who peer supporters felt close to. If my aim was simply to generate a list of names (alters) who peer supporters could have spoken, to why did I not choose another NGQ?

My self-reflection on the interview process identified some potential explanations. Due to the limited time (c45-50 minutes) I had with the peer supporters, it was crucial that I was able to help them to engage easily and quickly with the NGQ. Thus, I decided that asking peer supporters to think about people they felt close to was more focused and less abstract than something which could be interpreted differently by different people such as "who do you speak to on a daily basis?" For example, there are various people that we see some days and

not others, so how do you define daily basis? It was, therefore, extremely important that peer supporters were not distracted by trying to figure out the parameters of the questions. Of equal importance was not selecting a primary NGQ that could result in a sprawling list of names that could not be explored fully due to time restrictions. Even if there were no time restrictions, as noted in the literature a long list of names increases the risk of interviewee (and interviewer) fatigue which could affect the quality of the qualitative discussion that followed after the sociogram was created (Borgatti, 2013, Crossley et al., 2015). Thus, a combination of a lack of guidance on how to select an appropriate NGQ for young people; protecting the time available; and making it relatable to the peer supporter resulted in a primary NGQ that was fairly specific in focus.

## 6.2.2 Cognitive processes

Asking peer supporters to think about the people they felt close to and rank them on a piece of paper with concentric circles is relatively simple in theory. However, as we have started to realise from the above discussion of NGQs, in practice it could be cognitively complex and sometimes challenging. Peer supporter ability to recall alters along with their reasons and thought processes for inclusion in their sociograms are explored further in this section.

### 6.2.2.1 *Alter recall*

Peer supporter alter recall, i.e., remembering names of alters to add to their sociogram and then which ones they had a smoking conversation with, could be taxing for peer supporters. The quote below illustrates that these thought process took some time.

*Interviewer: Okay. So is there anybody else that you have had any conversations with about smoking, being a peer supporter, or ASSIST that we've not got on your map?*

*Participant: Um...I don't really remember because it took me long to remember on the day I was putting it down [this refers to the day I went into school to recruit peer supporters to the study and asked them to complete a recruitment questionnaire].* (Julie)

This quote also refers to an important tool that I developed to help prompt participants to identify further alters to add to their sociogram. As shown in Appendix 10, before interviews

took place participants were asked to complete recruitment questionnaire. These were completed as part of the recruitment school visit (see paragraph 5.3.4.1 for further detail) when I visited the school to speak to peer supporters and tell them about the study, explain the consent process and invite them to opt-in. Students who were interested in taking part were then asked to complete the recruitment questionnaire which collected detail on the number of smoking conversations they remembered having and with whom. Initially it was intended to be used a sampling tool to ensure that those participants selected for interviews had a minimum of two separate conversations about smoking with different people. However, it also served as a useful prompt to use during interviews to help peer supporters populate their sociograms more fully – i.e., once peer supporters had added their alters, I was able to check to see if there was anyone missing and then introduce them to the discussion. This approach appears to have helped the peer support remember conversations that they may have forgotten about as demonstrated in the following quotes:

*Interviewer: So you mentioned when you filled out the form to take part in the interview that I think you might have had a conversation with a parent, have you spoken to your mum or dad about being a peer supporter?*

*Participant: Oh yeah, I did actually my dad. (Susan)*

*Interviewer: So... yeah you mentioned on your form that you might have spoken to a grandparent does that ring a bell?*

*Participant: Oh yeah, my dad's dad I forgot about that. (Michelle)*

Transcript analysis also highlighted examples where I actively prompted the peer supporter to help them with alter recall. As noted above this could take the form of referring back to the participant's 'opt-in' sheet, but also occasions where I encouraged participants to add coloured dots where appropriate.

*Interviewer: "What about your mum?"*

*Participant: "My mum used to smoke for years, but she stopped and then she started. But I think sometimes she has an e-cigarette, but I said to her that scientists haven't proved whether they are better or worse, so she's edging off it a wee bit now, to stop completely from that."*

*Interviewer:* “So it sounds like you have had a conversation with your mum. Do you think she should get a red dot?”

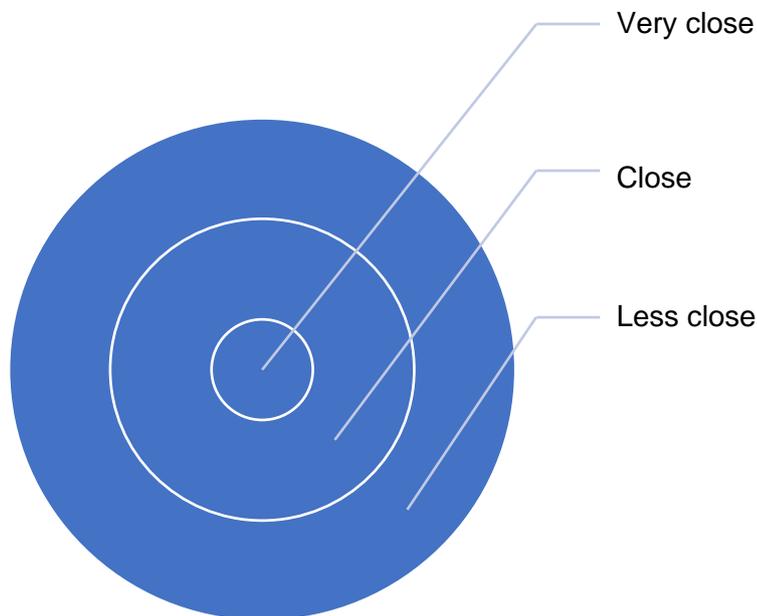
*Participant:* “Yeah” (Ann)

#### 6.2.2.2 *Alter placement*

In response to the initial NGQ, “*who do you feel close to?*” peer supporters were relatively quick and clear about who they were and were not adding to their maps. As discussed above (section 6.2.1.2) it would be wrong to assume that important people in their life such as parents and siblings would automatically be added to their sociograms. For some peer supporters, despite expressing love for their parents and younger siblings they were not people that they felt close enough to add to their sociogram. As the interviewer, I was cognisant that family composition is varied and diverse in today’s society, and consequently took great care not to cause any upset or discomfort for the peer supporter by deliberately not probing too much about family members that were not added. The remainder of this section outlines potential explanations of the rationale peer supporters used to position and rank alters in their sociogram.

As illustrated in Figure 6.1, and noted previously in section 5.3.2.4, peer supporters were asked to rank the people they added to their sociogram by level of closeness - the closer the peer supporter felt to the person, then the closer that person should be to the centre of the sociogram.

**Figure 6.1: Illustration of closeness categories in sociogram**



Looking at the sample of peer supporters overall, the ranking of alters appears to be fairly straightforward, with peer supporters quickly deciding where to rank alters by level of closeness. Once they had placed their alter onto their sociogram, peer supporters tended not to reposition them. However, there were some examples which highlighted the subtleties around the levels of closeness and placement of alters. Great care was taken by some peer supporters to position alters exactly on the border line between two levels of closeness, suggesting a degree of hesitation regarding where to place them. For example, as illustrated in Figure 6.2, Angela positioned six of her family nominations on the border line between very close and close. When asked why she decided on this approach, her reasoning was somewhat vague suggesting a degree of uncertainty regarding where to position them -

*Interviewer: Good! Where's Auntie xxxx? Okay so I see you put her over the line so does that mean she's kind of half in half out?*

*Participant: Yeah because I don't see her a lot, but I do at the same time, like...  
(Angela)*

**Figure 6.2: Sample sociogram**



A further example comes from Louise who added a fellow student to her sociogram because she had engaged her in conversation about smoking. However, she was disappointed in the outcome of this conversation because her friend had told her she would stop smoking but did not. This resulted in the participant no longer classing her as a friend, but because of the smoking conversation they had, they were added to the sociogram but were not ranked in terms of closeness because they were no longer friends.

*Interviewer:* So where would you put Molly on your map?

*Participant:* Just where she is.” [On the bottom left corner of the map, not ranked at all]

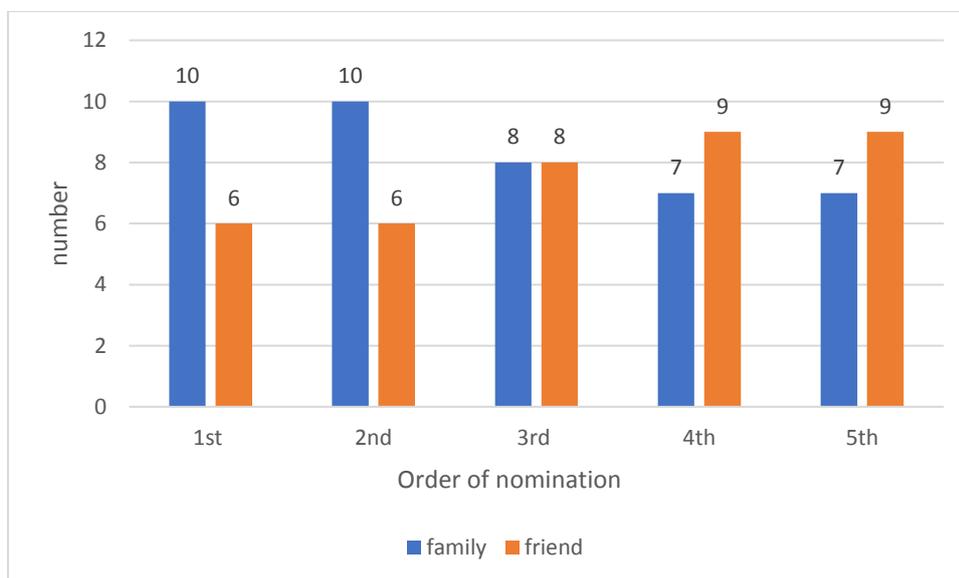
*Interviewer:* OK. You don’t need to put her on the map at all. So tell me about the conversation with Molly then. What was that?

*Participant:* I just tried to tell her that it wasn’t good for her. She knows it’s not good for her, but she wasn’t too bothered. She promised me that she would stop doing it, but she never did. She has tried to. There was a time when we were

*best friends and she did stop cos she knew I didn't like it. But she done it behind my back and that is one of the reasons we fell out.* (Louise)

Further analysis of who peer supporters nominated and how close they felt to them is the focus of Chapter Seven, so our focus here is who they nominated first – friends or family? As shown in Figure 6.3 peer supporters were more likely to nominate family members as their first and second nominees, and more likely to nominate friends by their 4th and 5th. This suggests that peer supporters were more likely to think of their family when they were asked to think of the people they feel close to.

**Figure 6.3: Nominations of family and friends by order of nomination**



### 6.2.3 Peer supporter views of making sociograms

Having explored the cognitive processes involved in creating the sociograms attention now turns to peer supporter feedback on making their sociograms. At the end of the interview participants were asked their thoughts on making their sociogram and how easy or difficult they found this to do. Despite the obvious caveat that participants may not have felt able to be truly open and honest in front of me (for reasons discussed in 5.3.2.1), feedback was generally positive. Participants commented that they enjoyed creating the sociograms and found it easy to do.

*"I actually found it really fun. I enjoyed it".* (Louise)

*"It was kind of easy to do like the ones who are closer and not closer, and the best friends."* (Julie)

Creating their own individual sociogram appeared to help peer supporters visualise their networks, something which they had never done before, and offered a deeper understanding of their relationships.

*"I like it because then you know like who you hang about with and like who you talk to most and actually like...know more about what's...like...who you trust."* (Julie)

Sociograms also introduced a practical side to the interview which took away the formality of a traditional face to face interview and may have made participations feel more at ease.

*"I have found it easy and like, it's not like an interview it's more informal and easier"* (Michael)

*"Um...it was laid back it wasn't formal".* (Michelle)

Despite this generally positive feedback, feeling apprehensive before the interview took place was expressed by some participants. This was in relation to not knowing what to expect, being interviewed by a stranger and concerns around sharing the smoking status of people they added to their sociogram. However, these feelings appeared to have been alleviated once the interview started and my post interview observation sheets recorded that participants appeared relaxed and reassured that their feedback was valued and treated in strict confidence.

*"I thought it was good but I was kind of scared to say like my big brother to smoke because he's my big brother and he thinks that my mum and dad don't know that he smokes but my mum and dad do know that he smokes."* (Bashar)

*"I thought when I first came into it, it was a bit scary but after getting into it I thought it was brilliant."* (Ellie)

Finally, a broader ethical issue was raised when one participant, Michelle, who was asked for her thoughts on creating their sociogram and commented, *'I should socialise more'*, implying that her social network was small. This peer supporter did not have a particularly small network (eight alters) yet their perception was that they needed more friends. This raises a potential ethical concern that this young person may have left the interview feeling that they were lacking friends or wondering how they compared with the other participants.

#### **6.2.4 Deeper interpretation: using post-it notes and coloured dots**

As noted in Chapter Five, the research methodology used to collect data for this study was novel, not in its use of sociograms, but in the addition of different coloured post-it notes and coloured dots to visually represent key detail in the sociograms (e.g., pink post-it notes for family and yellow for friends, red coloured dots to highlight people the peer supporter had spoken to about smoking and blue dots to identify people who the peer supporter thought the conversation had made some kind of impact – see Figure 6.1). Using visual props helped the young person engage with the interview and facilitated co-creation of their sociogram. Participants liked that they were the ones to add the sticky notes and dots to their maps.

*Interviewer: What did you enjoy about it [making their sociogram]?*

*Participant: Um...the questions [from the interviewer] and the sticky notes.*

*(Umar)*

From a data collection perspective, the use of coloured post-it notes and sticky dots was an extremely useful tool to help me interpret sociograms in real time and prompt for further questioning. From an analysis perspective it was easy to look at the sociograms and quickly see the extent of message diffusion and to whom (i.e., friends or family). Finally, from an ASSIST delivery perspective the approach offers an alternative way to record the extent of message diffusion which participations found acceptable and beneficial. For example, it helped peer supporters see who they spoke to and reflect on whether the conversations were positive or negative

*Interviewer: How did you find that mapping process? What did you think?*

*Participant: You know how sometimes you have to map things out in yourself, so it really shows who you have had a conversation with and what ones went better and why they went better.”* (Ann)

### **6.2.5 Recruitment tool for alter interviews**

As noted in the methods chapter, one of the objectives of this research was to test a novel approach using a respondent driven recruitment strategy, where peer supporters used their sociograms to nominate alters for follow-up interview. The aim of these alter interviews was to explore thoughts and perceptions of ASSIST and what influence (if any) discussions with peer supporters had on their attitudes and knowledge towards smoking and, if appropriate, their own smoking behaviour. Peers supporters were given green dots to add to the alter post-it note on their sociogram to show that they had selected them for interview. Once they had made their selection, they were given interview invitation letters and asked to deliver them to their selected alters. Each invitation had the study information leaflet, consent form and a reply-paid envelope, which they had to send back to the student (Appendix12). This ‘opt-in’ approach was a specific requirement for ethical approval and, unsurprisingly, had strengths and weaknesses. From the peer supporter perspective, it gave them control over whom they selected for follow-up. Because the sample of alters for follow-up was selected by the peer supporters, the data generated may be different to that which would result if all of the alters had been given equal chance of taking part. This is similar to one of the criticisms of SNA which is that perspectives of influence on alters comes only from egos (Crossley et al., 2015).

Of the sixteen peer supporters who took part in an interview just over half (nine) added green dots to their sociogram and agreed to pass over the invitation letters. Of the remaining seven, four were not asked to make nominations because there was not enough time to include this and three did not nominate anyone. As illustrated below, reasons for this centred on language barriers and busy working lives, which the peer supporter felt, would prohibit their involvement.

*My family doesn't speak English that well. My granddad or my uncle don't and my mum and dad work like sometimes its weird hours [they work].* (Michelle)

In total twenty letters of invitation were given to peer supporters to pass onto the people they selected. Unfortunately, none of them responded, which resulted in no alter interviews. There is no way to be certain why none of the alters opted in as no follow-up interviews were

conducted with peer supporters. However, it is likely that there are at least four possible explanations for this.

First, the recruitment approach itself was dependant on the peer supporter handing over the invitation and their alter then being motivated enough to opt in. This was a high-risk recruitment approach from the outset due to its dependence on participant motivation and willingness to participate. Even if the peer supporter was motivated to pass over the letter of invitation, and their alter was interested in taking part, it required effort and time to post the consent to contact form back to me.

Second, peer supporters were only permitted to nominate alters who were aged 16 or older. I made this decision because anyone under 16 would have required parental/guardian consent which would have made the process even more convoluted. However, being able to include alters under 16 may have generated a wider pool of alters for interviews as it would have included friends of the peer supporter aged between 13-14 years old.

Third, as discussed in Chapter Eight, one of the potential challenges peer supporters faced was talking to an adult about smoking and how receptive the adult was to the conversation. In light of this, it is plausible that the young person may not have felt confident handing over the letter of invitation to their adult alters and may not have wanted to share this with me; or, the peer supporter may have assumed that the conversation was too short for the alter to have remembered it and there was, therefore, no point in inviting them to take part in an interview. This leads onto the last potential explanation, peer supporters may simply have said that they would pass on the letters of invite because they wanted to please me.

I did not seek ethical approval to ask for peer supporter contact details as I did not feel this was appropriate in the context of conducting interviews and, as noted previously, would have made the consent process even more complex. This made alter recruitment even more challenging because I was not able to make any call backs to peer supporters to encourage participation.

### **6.2.6 Recommendations for future research using this method**

This final section is more practical in focus, highlighting factors that are important to be aware of and recommendations for anyone considering using this or a similar data collection

approach. As noted previously, a particular challenge was time, especially when fieldwork took place during one class period (which was around 50 minutes).

I had to obtain consent, establish a rapport in order to try and alleviate any anxiety the student may have about talking to an adult they did not know within this time limit. In addition, as the topic guide shows (Appendix 7), other detail related to the understanding and experience the peer supporter had of ASSIST was required as well as alter recruitment. This meant that creating the sociogram had to be completed in as time efficient a manner as possible (around 10 minutes), whilst also making sure that the young person felt comfortable, had enough time to grasp the concept and think about who to nominate. In order to manage this, I prepared somethings in advance (e.g., post-it notes to collect alter demographic information), but as the interviews were conducted other time saving tips emerged. This has culminated in nine recommendations based on my experience of the process, which may help future studies using the same or similar approach.

1. Building a connection with the school in order to ensure they understand the purpose of the research, the methods to be used when carrying out the study. In addition, emphasising how and why it will benefit the student, the school and wider community is crucial in obtaining buy in and permission to carry out research in this environment
2. The venue for the interview should be carefully considered and should ideally minimise disruption and distraction.
3. Interview opt-in sheets can be used as an additional tool to prompt participants for additional names that could be added to their sociogram.
4. Asking students whether they would prefer to add detail to their nominations for alters themselves or have the interviewer do this ensures inclusion of students with dyslexia or literacy challenges.
5. By informally discussing family and friends, with whom the young people live with at the beginning of the interview, participants become acquainted with the nomination process as they had already started to think about who the important people were in their lives are before being asked to list them.

6. Using different coloured post-it notes to distinguish between friends and family is an extremely effective visual technique that helps to identify the balance of friends and family nominated.
7. It is important to ensure that demographic information is not lost. Care should be taken to ensure that the sticky-dots are not placed in a manner which obscures text and the colour of the dot is evident.
8. Similarly, it is important that post-it notes are not placed in a manner that obscures text on the sociogram. Participants should be asked to reposition post-it notes if necessary.
9. When the sociogram is finalised and the participant is happy with the layout, post-it notes should be secured using sellotape (or other adhesive) to ensure no data is lost.

### **6.3 Summary**

This chapter reflected on, and critically appraised, the novel method of data collection utilised in this thesis. The method is considered to be novel because it used qualitative social network analysis to understand the potential and actual reach of ASSIST message diffusion. The incorporation of post-it notes, and sticky coloured dots provided a new approach to engage with young people in a visual and collaborative manner, whilst also generating real time data for further exploration in an interview. A review of the literature suggests that this particular approach had not previously been used with young people. Thus, this chapter contributes to the existing evidence base in three ways. First, it has generated guidance on collecting network data from young people, second it has tested name generation questions for young people and third tested a novel recruitment approach to interview alters.

In addition to nominating and ranking alters, participants were also required to remember who they had previously had a conversation with about smoking, and the context of that conversation such as how it was initiated, where and when it took place and what the discussed. Feedback from the peer supporters on the process of making their sociograms, and how they interpreted the primary name generation question, suggested that they understood the task and also enjoyed it. As will be seen in subsequent chapters, the interviews generated rich and detailed data that add greater depth of understanding regarding the potential and actual reach of message diffusion and the factors that influenced it.

To capture the views from alters themselves, one of the objectives of the thesis was to pilot a respondent driven recruitment approach. This approach required the participant (ego) to nominate and then invite alters to opt-in for an interview. On reflection, it is perhaps not surprising that this approach was unsuccessful as it may have placed too much of the recruitment burden on the peer supporter and their alter.

# Chapter 7: Message diffusion: potential and actual reach and perceptions of influence

## 7.1 Introduction

One of the aims of this thesis was to examine the **potential** and **actual** extent of ASSIST message diffusion beyond the school year. To help achieve this a deeper understanding of the structural properties of peer supporter social networks is required – if we do not know what peer supporter networks look like, how can we consider the potential reach of ASSIST beyond the school year? Developing this structural understanding is the first objective of this Chapter. The second objective is to explore the actual extent of message diffusion and the factors that influenced this, as well as peer supporter perceptions of conversation influence.

As noted in the methods chapter, data were collected using qualitative methods but were analysed using formal social network analysis (i.e., descriptive quantitative analysis), and qualitative thematic analysis. This chapter focuses on the quantitative 'formal' analysis and considers the following four analytical questions:

1. What was the potential extent of message diffusion (i.e., how many people could peer supporter have spoken to?)
2. What was the actual extent of message diffusion (i.e., who did peer supporters speak to?)
3. What factors influenced the spread of message diffusion?
  - a. Did the size of the network matter (i.e., were larger networks more likely to have greater diffusion than smaller networks)?
  - b. Were peer supporters more or less likely to speak to their friends or family members?
  - c. Were peer supporters more or less likely to speak to people they felt more or less close to?
  - d. Were there particular alter characteristics that made it more likely for peer supporters to diffuse information about smoking? (e.g., were they more likely to speak to smokers than non-smoker)?
4. Who, in their network, did peer supporters think were influenced by the conversation?

Despite the sample size being just large enough to support non-parametric statistical testing using the Fisher's exact test or the Mann-Whitney U test, after careful consideration and discussion with my supervisors it was decided that this was not appropriate due to the hybrid approach taken to create the peer supporter sociograms. As previously discussed in Chapter Six, alters included in peer supporter sociograms were generated through a primary name generation question which asked peer supporters to consider who they felt close to. However, in order to ensure that I captured detail on as many of the people peer supporters had a smoking conversation with, I then had to add secondary name generations questions. This resulted in a list of alters with varying degree of closeness which could comprise interpretation of any statistical tests. Thus, results presented below should be viewed as descriptive findings from an exploratory study, which indicate potentially significant findings for further exploration in a larger sample.

## 7.2 Potential extent of message diffusion

Starting first by examining the potential number of alters that peer supporters could have initiated a smoking conversation with. This was calculated by counting the number of alters each peer supporter added to their sociogram which came to 151. Three peer supporters added four further nominations to their sociograms. However, as these were groups of people (e.g., S3 or S2 year groups in general, friends from primary school or teachers) and not named individuals they were excluded from the analysis. It is important to note that the total number of alters added to peer supporter sociograms (n=151) represents the number of alters peer supporters could have spoken to in response to the specific name generation questions that I asked. In light of this, it is most likely an under estimation of the true size of peer supporter social networks.

The mean number of alters in each peer supporter network was 9.4 (calculated by dividing the potential number of alters by the number of peer supporters  $151/16$ ) Thus, on average peer supporters could have spoken to 9.4 people about smoking. The smallest networks comprised six people (alters) and the largest 14.

Based on these findings, from this sample of peer supporters, we can be confident that peer supporter networks were large enough to *potentially* diffuse smoking information from ASSIST.

### 7.2.1 Alter nominations by gender of peer supporter

The 151 alters nominations included 100 (66.2%) female alters and 51 (33.7%) male alters. Table 7.1 presents the gender breakdown of alter nominations by peer supporter gender. From this it can be seen that female peer supporters made more nominations than male peer supporters – 110 alter nominations came from female peer supporters in comparison with 41 from male peer supporters. This is not surprising given the gender profile of the peer supporter sample, which comprised of 10 female students and six male students. In addition, female peer supporters were more likely to nominate female alters (74.5% of alters were female compared with 25.4% male). However, this was not the case for male peer supporters whose alter nominations were less gender specific (43.9% female alters compared with 56.1% male alters).

**Table 7.1: Alter nominations by gender of peer supporter and alter**

Gender of peer supporter	Gender of alter		Total
	Female % (n)	Male % (n)	
Female (n =10)	74.5% (n=82)	25.4% (n=28)	110
Male (n = 6)	43.9% (n=18)	56.1% (n=23)	41

### 7.2.2 Alter nominations by gender of peer supporter and alter smoking status

Of the 151 alters added by peer supporters to their sociograms the majority (80.1%, n=121) were non-smokers. This is not surprising for two reasons. First, is the decline in smoking prevalence in Scotland noted in section 2.2.2.2. Second, peer supporters were guided by ASSIST trainers to speak to anyone in their year group regardless of whether they knew or suspected the individual of smoking or not. As noted in section 2.4 the aim of ASSIST is to prevent future smoking behaviour, with peer supporters encouraged to speak to their peers about the risks of smoking and the benefits of being smoke-free (Audrey et al., 2006).

As illustrated in Table 7.2. female peer supporters were more likely to nominate smokers than male peer supporters - 86.7% of alters who were described as a smoker by a peer supporter were nominated by a female peer supporter, in comparison with 13.3% nominated by male peer supporter.

**Table 7.2: Alter nominations by gender of peer supporter and alter smoking status**

Gender of peer supporter	Alter smoking status	
	Smoker % (n)	<sup>1</sup> Non-smoker % (n)
Female (n =10)	86.7% (n=26)	69.4% (n=84)
Male (n = 6)	13.3% (n=4)	30.6% (n=37)
Total	30	121

<sup>1</sup> The smoking status of four alters was unknown and four used e-cigarettes only. These cases have been added to the non-smokers category.

Looking more closely at the characteristics of alters who were classified as smokers by the peer supporters in this sample (Table 7.3) we can see that: the gender split was fairly even with 46.7% being female and 53.3% being male (despite the majority of alters nominated being female 66.2%, n=100); the majority were out with the peer supporter age group (83.3% were aged 18 and over) and family members (79.9%). These findings suggest that message diffusion did extend beyond the peer supporter's school year and into peer supporter wider social networks.

**Table 7.3: Characteristics of alters classified as smokers**

Sex	% (n)
Female	46.7% (n=14)
Male	53.3% (n=16)
<b>Age</b>	
13-17	16.7% (n=5)
18-34	40% (n=12)
34-54	23.3% (n=7)
55+	20% (n=6)
<b>Relationship to Peer supporter</b>	
Parent	20% (n=6)
Sibling	10% (n=3)
Grandparent	20% (n=6)
Aunt/Uncle	26.6% (n=8)
Cousin/niece/nephew	3.3% (n=1)
School year friend	10% (n=3)
Other	10% (n=3)

### 7.3 Actual extent of message diffusion

Having looked at the *potential* number of people (alters) peer supporters could have spoken to about smoking, which was 151, attention now turns to the *actual* number of alters peer supporters reporting having a smoking conversation with (research question 2). As shown in Figure 7.1, which compares the potential and actual number of conversations, the number of alters peer supporters reported having a smoking conversation with 103. This means that peer supporters diffused information about smoking to 68.2% of their network. The average number of reported conversations per peer supporter was 6.4 (103/16), with a range of between one and 11 conversations.

**Figure 7.1 Comparing the potential and actual extent of message diffusion**



It is important to note, that the actual extent of message diffusion (n=103) is the total number of people peer supporters reported speaking to and not the total number of conversations they actually had, as peer supporters could have had more than one conversation with each person. With hindsight, it would have been helpful to have explored the number of conversations with each alter in more detail. However, as previous studies of ASSIST (Audrey et al., 2006) have shown that conversations generally happened immediately after peer supporter training, and were often brief in duration, I felt that peer supporters would find it difficult to remember this level of detail. Thus, in the interests of time I decided not to include data collection on this.

## **7.4 Factors that influence message diffusion**

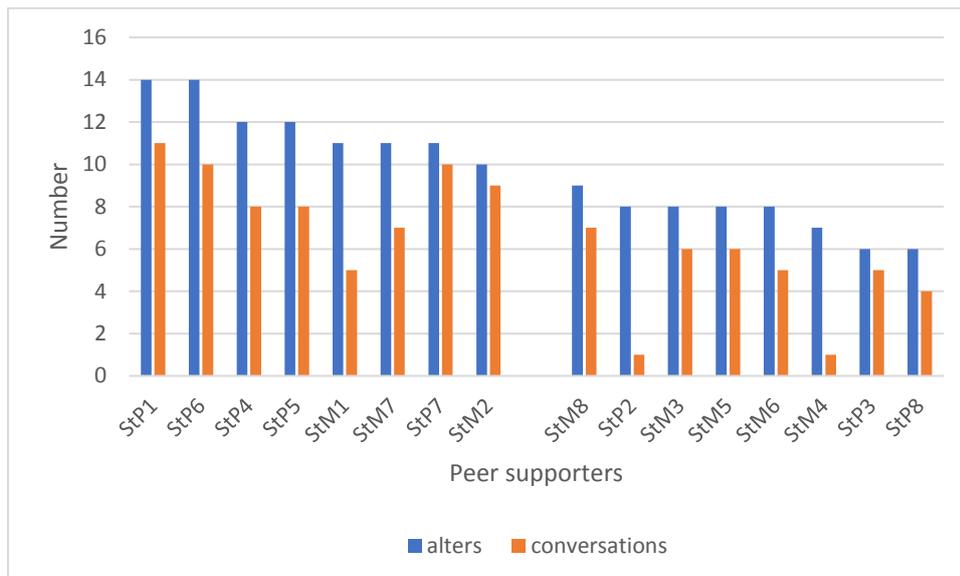
Having looked at the potential and actual extent of message diffusion in peer supporter networks, this section will now explore the factors that may have influenced message diffusion (analysis questions 3.1-3.4).

### **7.4.1 Size of peer supporter network**

The starting point is to understand more about the size of peer supporter's social networks and what influence this has (if any) on message diffusion. This will address research question 3.1 - *is the size of the peer supporter's network associated with the number of people they reported having a smoking conversation with?*

Descriptive analysis, from this exploratory study, presented in Figure 7.2 compares the number of alters (i.e., the potential number of people peer supporters could have spoken to) with the number of reported conversations and indicates that, unsurprisingly, peer supporters with bigger networks had a greater number of conversations, than those with smaller networks. In Figure 7.2 peer supporters are ordered by those with the largest number of alters in their sociogram to the smallest and further divided into two groups - those whose networks were larger than the mean and those whose networks were smaller. Those in the first group had conversations with a total of 68 people, with a mean of 8.5 conversations per peer supporter. In contrast, peer supporters in the second group (below the mean) had conversations with a total of 35 people with a mean of 4.4 people per peer supporter.

**Figure 7.2: Message diffusion by network size**

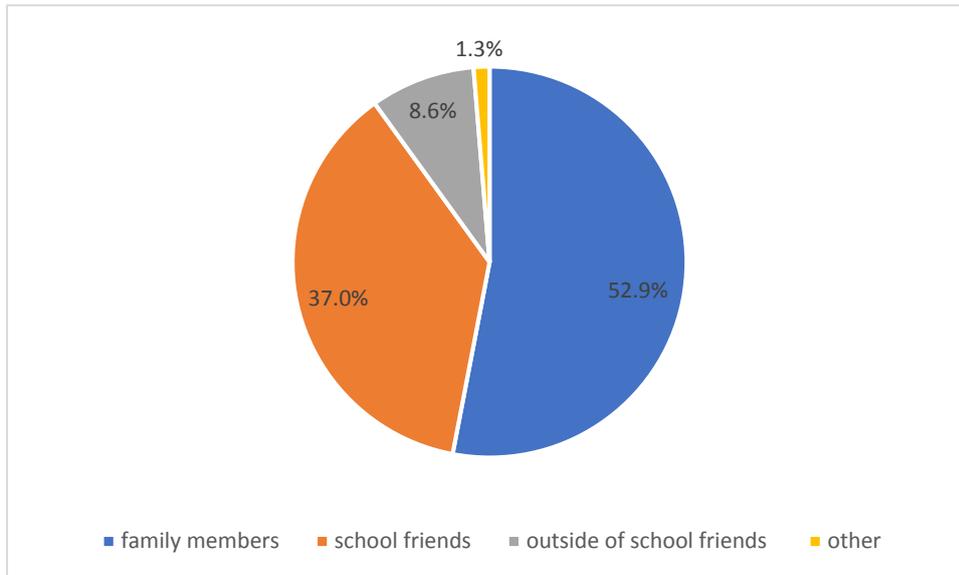


### 7.4.2 Type of relationship

Findings so far have highlighted the potential importance of network size with larger networks having wider diffusion, but what about the types of people who are part of peer supporters' social networks? Are peer supporters more likely to diffuse information to their friends or their families or is there no difference (analysis question 3.2)?

Looking first at the total number of alters peer supporters could have initiated a conversation with (n=151), Figure 7.3 shows that more than half (52.9%, n=80) were family members, 37% (n=56) were school friends, 8.6% (n=13), were outside of school friends and 1.3% (n=2) were others (e.g., neighbour, family friend). This highlights that, for this sample of peer supporters, network composition was skewed slightly more towards family members, which demonstrates, that there was a large pool of family members who peer supporters could have spoken to about smoking as a result of taking part in ASSIST.

**Figure 7.3: Peer supporter relationship to alters**



A similar pattern was found when we compare alter relationship to peer supporter by network size above or below the average size of peer supporter networks (Figure 7.4). Regardless of network size, there was a higher representation from family members.

**Figure 7.4: Peer supporter relationship to alters grouped by above or below network size average**

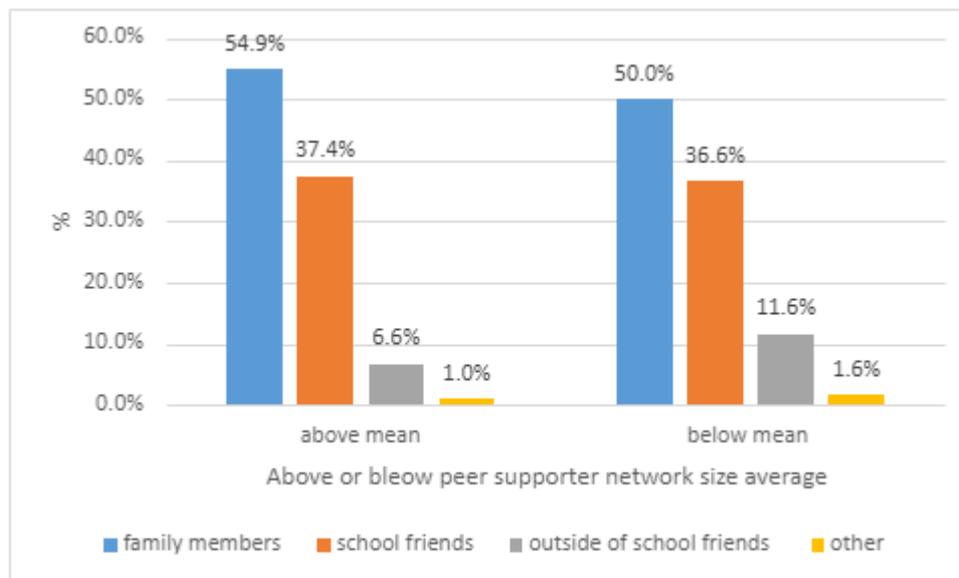
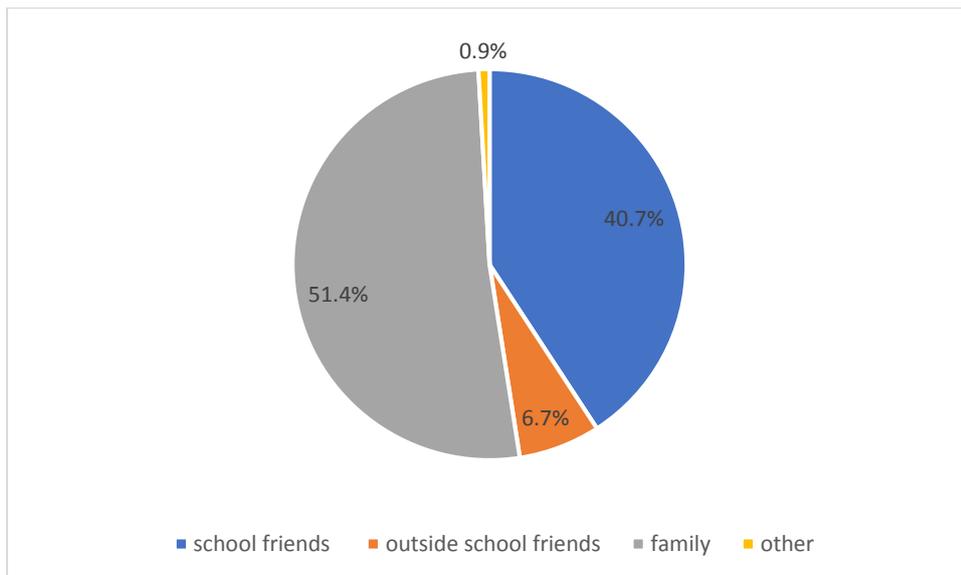


Figure 7.5 looks at the 103 alters peer supporters reported have a smoking conversation with by their relationship to the peer supporter. Over half (51.4%, n=53) of peer supporters spoke to a member of their family, 40.7%, (n=42) spoke to their school friends and a further 6.7% (n=7) spoke to their non-school friends, 0.9% (n=1) spoke to someone else. This suggests that the peer supporters were more likely to speak to their family than their school friends. This is an important finding when the context of ASSIST delivery in the Scottish pilot is considered. In the pilot, trainers advised students to only speak to other students in their school year (as discussed previously in 1.4). However, this study found that only two fifths (40.7%, n=42) of the smoking conversations peer supporters had were with school friends (Figure 7.5). A potential explanation for this could be that peer supporters may have felt safer talking to family members than their school friends or peers. This, as well as the other factors that influenced peer supporter’s decisions about who to speak or not, is discussed further in Chapter Eight.

**Figure 7.5: Peer supporter smoking conversations by alter relationship to the peer supporter**



### 7.4.3 Level of closeness

Looking at the sample overall (n=151), Figure 7.6 shows that peer supporter networks were mostly comprised of alters who they felt either very close to (63.2%, n=98) or close to (29%, n=45). This finding is not surprising given that the primary name generation question peer supporters were asked to think about was the people they felt close to. Further, as noted in Chapter Six peer supporter first and second nominees (in this sample) were more likely to be family members than friends.

**Figure 7.6: Peer supporter level of closeness to all alters added to their sociograms**

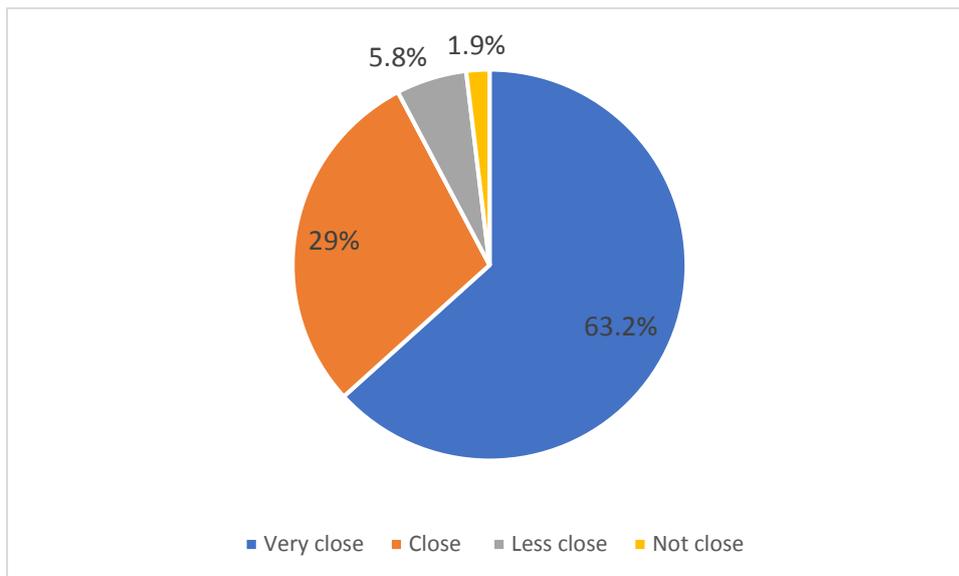
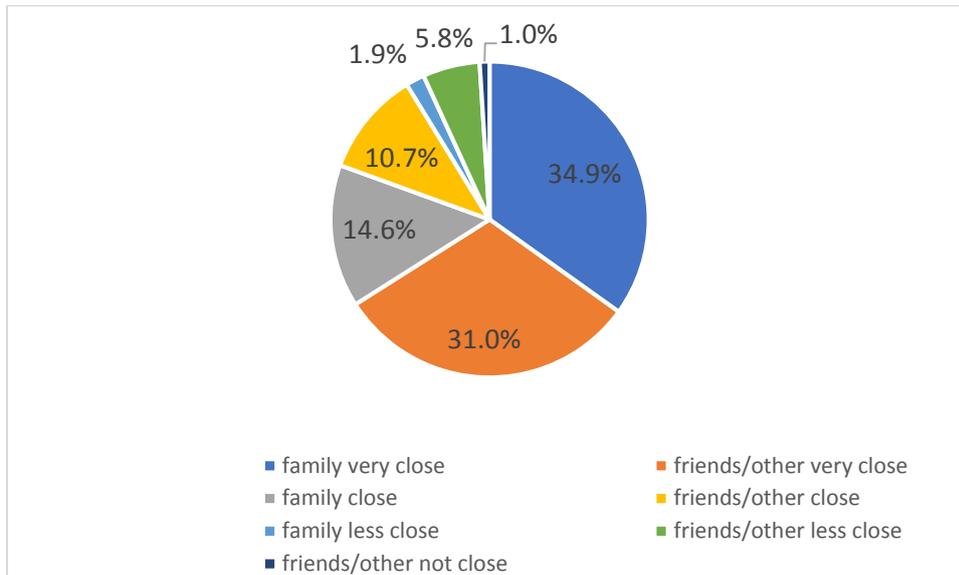


Figure 7.7 presents levels of closeness for the 103 people peer supporters spoke to about smoking (message diffusion) and addresses research question 3.3. While peer supporters were most likely to have a conversation about smoking with the people who they felt the closest to (34.9%, n=36 talked to family members and 31%, n=32 talked to their friends), over one third of people spoken to were less close or not close at all. This suggests that ASSIST message diffusion can transcend beyond close social network members. Qualitative data from the in-depth interviews that accompanied the sociogram creation adds further context to explaining the factors that influenced peer supporter decision to speak to people in their network or not (Chapter Eight).

**Figure 7.7: Peer supporter level of closeness to alters who peer supporters had a smoking conversation with**



#### 7.4.4 Alter characteristics

In this section the focus is interpretation of the additional ‘name interpreter’ detail peer supporters were asked to add to their post it note for each alter they added to their sociogram. This included detail such as the alter’s: age; gender; employment status; frequency of contact; and smoking status. These data contribute to analysis question 3.4 – are there particular alter characteristics that make it more likely for Peer Supports to diffuse information about smoking (e.g., are peer supporters more likely to speak to smoking than non-smoker).

Table 7.4 presents a summary of alter characteristics for potential and actual conversations. Column A, presents the characteristics of people nominated by the peer supporter (i.e. who they could have potentially initiated a smoking conversation with). Characteristics of the people peer supporters actually initiated a smoking conversation with are presented in Column B and, finally, Column C shows the conversion from potential to actual conversation. This was calculated by comparing potential conversations (column A) with actual conversions (column B), e.g. of the 51 males who peer supporters could have potentially initiated a smoking conversation with this was converted into actual conversation with 35 males so the conversation rate was 69% ( $35/51 \times 100$ ). Key findings for each characteristic are discussed below.

## *Gender*

Despite the uneven gender split in relation to alter characteristics by sex (column A of Table 7.4: females 66%, n=100, males 33%, n=51) and in the reported number of alter conversations by sex (column B: females 66%, n=68, males 34% n=35), the gender difference disappears when looking at it in terms of conversion rates, which are the same for both male and female alters (column C: females 68%, n=68, males 69%, n=35). One explanation could be that male alters were more likely to be smokers than females. However, when the gender profile of the 27 smokers who peer supporters reported a smoking conversation with is considered this does not seem a plausible explanation - just over half of alters who were smokers were male (59%, n=16) and 41% (n=11) were female. Further research with a larger sample is required to investigate this further.

## *Age*

Table 7.4, column A, shows that nearly half (47.5%, n=49) of alters nominated were in the same age bracket as peer supporters (13-15). This is not surprising given that ASSIST trainers advised peer supporters to speak to people in their school year only. The conversion rates (from potential to actual conversation) for alters in the 13-15 years old age group was, 67.1% (49/73), which was very similar to the conversion rate of 69.2% for all other age groups. Thus, despite the target age group for ASSIST message diffusion being 13-15-year olds, findings from this exploratory analysis suggest that the conversion rate from potential to actual conversations was very similar for the target age group but also all other ages combined. This further supports the conclusion that ASSIST message diffusion extends beyond the peer supporter school year and into their broader social networks.

## *Family member type*

As noted previously in section 7.4.2 two fifths (40.7%, n=42) of actual conversations took place with other students in the peer supporter's school year. This means that over half of conversations were with people out with the school environment and included family and out of school friends. From column C (Table 7.4) we can see that the conversation conversion rate from potential to actual was 77.8% for school year friends. However, when we combine the other types of relationships category, we can see that 63% were converted from potential to actual conversations (61/97). This again supports the conclusion that message diffusion was spreading further than the peer supporter school year group and into their broader social networks.

*Alter smoking status*

Table 7.4 compares the characteristics of alters who were nominated and those with whom conversations took place, which were broadly similar. The majority of alters nominated by peer supporters were non-smokers (75%, n=113) and of the 103 alters with whom peer supporters had a smoking conversation with, only one fifth (21.3%, n=27) were smokers. Nevertheless, the conversion from a potential to an actual conversation was very high at 90%. This suggests that targeting smokers was a strategy used by peer supporters when deciding who to initiate a conversation with. This will be explored further in Chapter Eight.

**Table 7.4: Alter characteristics**

<b>A) Characteristics of alters added to peer supporter sociograms (i.e. <u>potential</u> conversation N=151)</b>		<b>B) Alters spoken to (n=103)</b>	<b>C) Conversion from potential to actual conversation (n=103)</b>
<b>Sex</b>	% (n)	% (n)	% (n)
Female	66% (n=100)	66% (n=68)	68% (n=68)
Male	33% (n=51)	34% (n=35)	69% (n=35)
<b>Age<sup>1</sup></b>			
12 and under	5% (n=7)	3.8% (n=4)	57.1% (n=4)
13-15	48% (n=73)	47.5% (n=49)	67.1% (n=49)
16-24	10% (n=15)	6.8% (n=7)	53.3% (n=7)
25-34	7% (n=10)	9.7% (n=10)	100% (n=10)
35-44	9% (n=14)	7.7% (n=8)	78.6% (n=8)
45-59	9% (n=14)	9.7% (n=10)	71.4% (n=10)
60+	3% (n=5)	3.9% (n=4)	6.8% (n=4)
Unknown	9% (n=13)	10.7% (n=11)	23.1% (n=11)
<b>Relationship to Peer supporter</b>			
Parent	17% (n=26)	20.4% (n=21)	80.1% (n=21)
Sibling	11% (n=16)	10.7% (n=11)	68.8% (n=11)
Grandparent	7% (n=11)	8.7% (n=9)	81.9% (n=9)
Aunt/Uncle	11% (n=16)	9.7% (n=10)	62.5% (n=10)
Cousin/niece/nephew	6% (n=9)	1.9% (n=2)	22.2% (n=2)
School year friend	36% (n=54)	40.8% (n=42)	77.8% (n=42)
Outside school year friend <sup>2</sup>	12% (n=18)	6.8% (n=7)	38.9% (n=7)

Ex-school friend	1% (n=1)	0.9% (n=1)	100% (n=1)
<b>Frequency of contact</b>			
every day	40% (n=60)	43.6% (n=45)	75% (n=45)
most days	30% (n=45)	29.1% (n=30)	66.7% (n=30)
couple of days a week	11% (n=17)	12.6% (n=13)	76.5% (n=13)
one a week	5% (n=7)	1.9% (n=2)	28.6% (n=2)
2-3 times a month	11% (n=16)	10.7% (n=11)	68.7% (n=11)
once a month or less	4% (n=6)	1.9% (n=2)	33.3% (n=2)
<b>Smoking status</b>			
Smoker	20% (n=30)	21.3% (n=27)	90% (n=27)
Non Smoker	75% (n=113)	69.0% (n=71)	62.8% (n=71)
E-cigarettes	3% (n=4)	2.9% (n=3)	75% (n=3)
Unknown	3% (n=4)	1.9% (n=2)	50% (n=2)

<sup>1</sup> Peer supporters did not know the exact age for some of their alters so gave their best estimate

<sup>2</sup> Included: neighbours, big brother's girlfriend, sisters friend and friends that went to a different school but they knew from clubs, playing with at home

## 7.5 Peer supporter perception of influence

Of the 103 people peer supporters had a smoking conversation with, perceptions of some kind of influence were reported for over one third (36.9%, n=38) with thirteen of the 16 peer supporters believing that some of their smoking conversations may have had some kind of influence. The size of the network for the three peer supporters who did not perceive any influence tended to be smaller ranging from six to eight alters. In addition, two of the peer supporters only spoke to one person each which meant that the potential for impact was very small to begin with. The third peer supporter, despite having a small network of six alters, reported speaking to five (83%) of their alters. Considering that this peer supporter had spoken to the majority of their alters, it is notable that they perceived their conversation to have had no influence.

Table 7.5 presents the characteristics of alters whom peer supporters thought they had influenced. Looking at gender first we can see that perceptions of influence on male alters was greater than for females (51% n=18, compared with 29% n=20). This finding did not vary

by gender of the peer supporter – i.e., male alters were not perceived to be any more or less influenced by the conversations than had been initiated by a male or female peer supporter.

Despite the 13-15 age group being the most common age group for an actual conversion to a smoking conversation, perceptions of having had an influence were low at 29%. Similar findings were apparent when comparing alter relationships to peer supporters with perception of influence on school year friends being low at 24%, the lowest of all the relationship types. Finally, although smokers were a key target group for conversations, perceptions of influence on smokers was modest at 44%.

**Table 7.5: Alter characteristics for perceived influence**

<b>Alter characteristics</b>	<b>A) Actual conversation (n=103)</b>	<b>B) Perceived influence of actual conversations (n=38)</b>
<b>Sex</b>	% (n)	% (n)
Female	66% (n=68)	29% (n=20)
Male	34% (n=35)	51% (n=18)
<b><sup>1</sup>Age</b>		
12 and under	3.8% (n=4)	50% (n=2)
13-15	47.5% (n=49)	29% (n=14)
16-24	6.8% (n=7)	37.5% (n=3)
25-34	9.7% (n=10)	40% (n=4)
35-44	7.7% (n=8)	45% (n=5)
45-59	9.7% (n=10)	45% (n=5)
60+	3.9% (n=4)	28.5% (n=2)
Unknown	10.7% (n=11)	100% (n=3)
<b>Relationship to Peer supporter</b>		
Parent	20.4% (n=21)	48% (n=10)
Sibling	10.7% (n=11)	64% (n=7)
Grandparent	8.7% (n=9)	56% (n=5)
Aunt/Uncle	9.7% (n=10)	30% (n=3)
Cousin/niece/nephew	1.9% (n=2)	0% (n=0)
School year friend	40.8% (n=42)	24% (n=10)
<sup>2</sup> Outside school year friend	6.8% (n=7)	43% (n=3)
Ex-school friend	0.9% (n=1)	0% (n=0)
<b>Frequency of contact</b>		

every day	43.6% (n=45)	51% (n=23)
most days	29.1% (n=30)	7% (n=2)
couple of days a week	12.6% (n=13)	39% (n=5)
one a week	1.9% (n=2)	50% (n=1)
2-3 times a month	10.7% (n=11)	64% (n=7)
once a month or less	1.9% (n=2)	0% (n=0)
<b>Smoking status</b>		
Smoker	21.3% (n=27)	44% (n=12)
Non Smoker	69.0% (n=71)	32% (n=23)
E-cigarettes	2.9% (n=3)	67% (n=2)
Unknown	1.9% (n=2)	50% (n=1)

<sup>1</sup>Peer supporters did not know the exact age for some of their alters so gave their best estimate

<sup>2</sup>Included: neighbours, big brother's girlfriend, sisters friend and friends that went to a different school but they knew from clubs, playing with at home

## 7.6 Summary

In this chapter 'formal' social network analysis was utilised to look at the potential and actual reach of message diffusion in peer supporter networks and the perceived impact of this. Bearing in mind the caveats around interpretation of the descriptive data presented in this chapter, there are three key findings which merit further investigation with a larger sample of peer supporters.

Looking first at the potential for wider message diffusion beyond the peer supporter school year and into their wider social networks. Findings from this study indicate that of the 16 peer supporters who took part in this study, their combined networks were fairly large with a total of 151 alters added to peer supporter sociograms. This strongly suggests that peer supporter networks were sufficient in size to support wider diffusion beyond the school year. A key finding from this exploratory analysis is that peer supporter social networks comprised of more non-school friends and family members than school year friends, which indicates that there is potential to broaden the reach of ASSIST message diffusion beyond their peer supporter school year and into their broader social network.

In terms of the actual extent of message diffusion, peer supporters reported a total of 103 smoking conversation with alters, with over half of these conversation with family members or non-school friends. These findings confirm that peer supporters are willing and able to initiate

conversations with both peers in their own school year and with members of their wider social networks.

Despite the majority of peer supporters (81.2%, n=13) commenting that they thought their smoking conversation had had influence on some of the alters they had spoken to, analysis of the sociograms reveals that overall, only one third of alters (36.9%, n=38) were believed to have been influenced in some way.

## **Chapter 8: Message diffusion context and content**

### **8.1 Introduction**

Chapter Seven focused on the structural properties of peer supporter networks. This developed an understanding of the potential extent of message diffusion (i.e., who peer supporters could have spoken to) as well as the actual extent of message diffusion (i.e. who peer supporters choose to speak to). It also highlighted peer supporter perceptions of conversation influence. However, as discussed in the methods chapter these data lacked important detail related to context and content. For example, why peer supporters chose to speak to some people and not others; how they initiated a conversation, as well as where and when conversations took place; what did they talk about; what was the perceived outcome; how did they feel after the conversation? Answering these questions is the purpose of Chapter Eight which draws on the qualitative narratives that accompanied sociogram creation. The chapter begins with consideration of two important elements: conversation context and conversation content. It will then consider peer supporter perceptions of conversation influence and finish with peer supporter perspectives on initiating and delivering smoking conversations.

### **8.2 Conversation context**

As noted by Craig et al., (2018) and Moore et al., (2014) , consideration of the context in which an intervention is situated creates a greater understanding of how, and why, interventions are successful or unsuccessful, and aids assessment of transferability to different settings or populations. This section will, therefore, consider the factors that influenced who the peer supporter initiated a conversation with, as well as how, where, and when they set about doing this.

#### **8.2.1 Initiating conversations: influencing factors**

As illustrated in Chapter Seven, Figure 7.1, on average peer supporters spoke to around two-thirds of the people (alters) in their social network. This included students in their year group but also people from their wider social networks, such as family members and friends outside of school. The focus of this section is to understand more about the factors that influenced

who peer supporters spoke to (or not). The following three themes were identified: recall and opportunity; confidence; and targeting smokers.

### 8.2.1.1 *Recall and opportunity*

As previously discussed in Chapter Six, (6.2.2.1), peer supporter discussions about conversation initiation were reliant on them remembering the conversations they had and with whom. However, as illustrated by the quote below, it was also reliant on the peer supporter remembering to initiate conversations with people they knew,

*Interviewer: And is there a particular reason that you've not done it [had a conversation] yet?*

*Particiaptn: I just think I maybe forgot or something. (Michael)*

Thus, peer supporters needed to be alert to opportunities for initiating conversations about smoking. For peer supporters who were trying to navigate their way through adolescence as well as the demands of schoolwork, combined with unknown challenges they may face in their personal lives, it is not surprising that they may simply forget to initiate a conversation.

However, for other peer supporters they may have made a conscious decision not to initiate a conversation about smoking. For example, Louise commented that because she did not see her Gran or Uncle very often, she wanted to spend the time they had together having fun, not talking about serious issues (like smoking),

*Cos I don't see my gran that often, when I go there I just want to spend as much time with her as I can. We watch films and eat sweets and stuff. Cos my uncle xxxx is there as well, it's just the same. We just talk about family and have a good laugh together. It's nothing serious we talk about. (Louise)*

A further example comes from Umar who explained that he had not spoken to his older sibling about ASSIST due to their mutually busy schedules preventing an opportunity to bring it up,

*...she comes back home late and when she comes back home we're eating dinner and she has to take a shower and after dinner we have a little bit of free time and she comes out of the shower and I have to go to sleep so... (Umar)*

These examples highlight the importance of context for conversation initiation – in the first example the peer supporter's affection for their family members meant that they wanted to maximise their time together and not have it compromised by talking about smoking. In the second, the peer supporter did not initiate a conversation due to a lack of time. However, it is not clear whether these peer supporters consciously made the decision not to talk about ASSIST or whether it was simply not something they remembered to do.

The importance of time was not confined to family members, with Angela noting that limited time with school friends meant they would rather talk about things that were not school related. For example, when Angela was asked why she had not initiated a conversation with two of her school friends she replied that,

*It's because I don't really see them a lot but the time I do we don't really like talk about what we're doing in school we just talk about like other things. (Angela)*

Finally, it is important to consider that difficulty in conversation recall could be a result of conversations often being brief and therefore difficult to remember. Despite peer supporters not being explicitly asked how long conversations lasted, section 8.3 looks at the content of conversations and suggests that some of these conversations could be very short.

#### 8.2.1.2 *Peer supporter confidence*

Confidence appears to have been a key factor that influenced with whom peer supporters initiated conversations with. This was predominantly expressed as not feeling confident that an approach to initiate a conversation would be received positively, resulting in a fear of a negative response. This was especially important if approaching a fellow student who was known to smoke, as illustrated in the quote below,

*...and there's two people [that smoke] but if I was to approach them they would be mad, there's no way to approach them because if I tried to approach them they would call me names. (Umar)*

Like Umar, Bashar also expressed feelings of anxiety when he was talking about two of his friends who were ranked in the outer circle of his sociogram (so not best friends). When asked why he had not spoken to them he expressed a fear of being ridiculed.

*Interviewer: So your friends on the map, tell me a bit about why you've not spoken to them about being a peer supporter or smoking or ASSIST.*

*Bashar: But (xxx) and (xxxx) I didn't really want to speak to them, I don't know why, I think I was a wee bit scared but at the same time I didn't know if they still smoked or not.....I just think that they would have said something to me like I'm talking a load or crap or something. (Bashar)*

Linked to this was not knowing the person who they wanted to approach very well and feeling uncertain about initiating a smoking conversation. This was illustrated by Julie who explained that she had identified a fellow student who she knew smoked and wanted to initiate a conversation with. However, because she did not know her that well she was reticent about approaching her on her own.

*Her name's xxxxx and I think she's addicted to smoking because she was smoking in class once but like the teacher didn't see her and she likes smokes after school and before school and that. So I kind of want to talk to her but like we don't really talk so..... xxxxx (Julie)*

Julie went onto express feelings of anxiety when she thought about talking to her fellow student because she (Julie) was not part of the alter's social group. This resonates with findings from Chapter Two (literature review looking at the factors associated with adolescent smoking) where peer influence and the hierarchical structure of some adolescent friendship groups were considered.

*I'm kind of anxious to because...like she's one of those people who like has a particular group of friends so like if you're not in that particular group you're not really friends. But she does talk to me kind of sometimes. (Julie)*

When asked how she could feel more confident to initiate a conversation her strategy was engage some other peer supporters to make the approach with her.

*Interviewer: Is there anything that could be done to make you feel more confident about having that conversation?*

*Julie: Um...well if xxxxxx or someone else like in the peer supporting group were to do it with me I would probably do it.* (Julie)

These quotes illustrate the challenges that peer supporters thought they may encounter making the initial approach to initiate a conversation, opting instead to protect themselves from potential unpleasantness by choosing not to approach particular individuals or seeking support from other peer supporters. This adds greater depth of understanding to the potential emotional load that the peer supporter role could place on a young person. This is especially relevant when considered in the context of adolescence where young people are maturing and may find social interaction awkward. Despite, none of the peer supporters, in this sample, expressing any discomfort or anxiety about executing their peer supporter role, they were not explicitly asked about this and it may have been difficult for them to articulate even if they had been.

### *8.2.1.3 Smokers and non-smokers*

The Scottish evaluation of ASSIST found that one of the main reasons peer supporters did not initiate conversations within their school year was because the majority did not smoke, which they felt made the conversation pointless (Dobbie et al., 2019). A similar finding was found in this exploratory study with Chapter Seven (7.2.2) reporting that the majority of alters nominated by peer supporters were also non-smokers (80.1%, n=121). Despite peer supporters being reassured, during their training, that they can and should speak to both smokers and non-smokers there were examples of peer supporters not initiating conversations because the alters did not smoke. For example, Umar explained that one of the reasons he had not spoken to any of his fellow school year students was because very few of were known to smoke,

*Interviewer: Have you spoken to many other people in S2?*

*Participant: Just xxxx, just xxxx yeah.*

*Interviewer: And is there any particular reason for that?*

*Participant: Hmm! It's because mostly everybody in our year no one smokes*  
(Umar)

Similarity, when Ann was asked why she had not initiated conversation with her two best friends about smoking she replied that there was no need because they did not smoke, and she did not think they were 'at risk' of starting to smoke.

A further example comes from Louise, who despite understanding that she could speak to both smokers and non-smokers, decided not to approach her non-smoking peers because she did not believe that the conversation would resonate with them.

*Interviewer: This is your map and that gives us an idea of who you have spoken to. Is there anyone that you've thought of speaking to, that you haven't done yet, apart from your gran and your uncle?*

*Participant: Not really no. There is not anyone else I know who smokes.*

*Interviewer: So would you only speak to people that smoke, or would you think of speaking to people that don't smoke?*

*Participant: Definitely people who don't smoke as well, but I feel they're not as interested. Cos they don't do it, they're like, why tell me, cos it's not going to affect me in any way.*

*Interviewer: Is that how you think they'll react?*

*Participant: Yeah (Louise)*

Further, linking back to the discussion of peer supporter confidence to initiate a conversation (discussed in 8.2.1.2) we are reminded that fear of being ridiculed or called names was a barrier to approaching other peers who were known to be smokers.

As noted in section 7.2.2, when peer supporters did initiate a conversation with smokers these tended to be with their non-school year alters, e.g., 83.3% (n=25) were aged 18 or older and 79.9% (n=24) were family members. An example comes from Bashar, who targeted his big brother because he was a smoker and shared with him some of the smoking facts he had learned around the chemicals in a cigarette. Despite Bashar noting that the conversation did not encourage his brother to stop smoking, the conversation appears to have been a positive experience and Bashar commented that this brother had learned something new.

*Interviewer: Okay and why did you decide to speak to your big brother?*

*Participant: Because he's the only person that I interact with a lot that I know that smokes,*

*Interviewer: Good, okay, and what things did you speak to him about?*

*Participant: I told him like stuff about his smoking, it contains a lot of disgusting things in it and like the chemicals you smoke a day in one cigarette and all of that....Some of it he said he knew about but some of it he was kind of surprised with.*  
*(Bashar)*

## **8.2.2 How conversations were initiated**

The previous section focused on developing an understanding of the factors that influenced who peer supporters decided to approach or not. Now, attention moves to look at how peer supporters initiated a conversation, with analysis pointing to two key themes: deliberate or spontaneous conversation initiation and alter led conversation initiation. Before, these two themes are considered, it is important to note that, overall, peer supporter narratives showed maturity and sophistication in how they set about initiating a conversation about smoking, with an awareness that advanced thought and a subtlety of approach were often required.

*Like I wouldn't rush someone and say you have to stop smoking because it's bad for you, well we know it's bad but I would just try and you know...maybe start off slowly by telling them what's inside or maybe showing them the hazards and the risks and how it can affect your body. And if they are smokers you know try and help them to seek help from parents, or teachers.*  
*(Alia)*

### **8.2.2.1 Deliberate vs spontaneous**

Strategies to initiate conversations were two-fold. On the one hand, there were pre-planned, deliberate, attempts to initiate a smoking conversion by focusing on particularly relevant facts that could be used as leverage to introduce smoking harms to conversations. On the other, conversations were sometimes spontaneous an opportunistic (dependant on the young person remembering their peer supporter role).

The pre-planned strategy is illustrated by two examples from Ellie and Amy. First, Ellie explained that she had told her friend that smoking could cause gum disease and would ruin

her teeth. She also made the point of saying that her friend wore braces, which suggests that she may have chosen this fact to maximise impact.

*They were away on a music trip and I asked her how it went. She said how did it [peer supporter training] go and I was like, good. Have you ever considered smoking? She was like, no I wouldn't do that. I was like, yeah good, because you can get some degree of gum cancer which can ruin your teeth. She wears braces. She was like, no I wouldn't do that.* (Ellie)

Next, Ellie recalled a conversation with a family member who smoked but was also saving for a holiday. The fact she shared was the financial impact of smoking and how much money could be saved if she stopped or cut down. This was perceived to have made a positive influence on the family member,

*I told her that most of the money from your cigarettes is tax. She is looking for money for a holiday. She told me, 'I'd better stop smoking' and since then she's cut down on fags. I don't know how many packets a day she used to have, but now it's on a few..... She usually takes out loans for a holiday and now she's like, that has really helped me.* (Ellie)

These examples suggest that Ellie had taken her role very seriously and given advanced thought not only about whom to approach, but also how she could initiate a conversation. It is not surprising that this peer supporter also had one of the highest rates of message diffusion, having initiated a conversation with 10 people from their sociogram.

A further example of a pre-planned approach to conversation initiation was using the peer supporter training days as a hook to start conversions. An example comes from Amy who explained that if an opportunity did not present itself she would tell the individual(s) that they had been away for two days training. This led on to a discussion about what it was about, which presented opportunities for Amy to share their facts.

*I just waited until they asked me, to bring it up. If they didn't ask me I was just like, oh yeah we were at a training programme.* (Amy)

### 8.2.2.2 Spontaneous

However, peer supporters also described conversations that arose spontaneously and were capitalised to initiate a smoking conversation or share some of the facts they had learned about smoking. Some examples included:

Watching a soap opera where the peer supporter and their friend were discussing how many of the characters smoked,

*Interviewer: Tell me a bit more about how did that conversation come up?*

*Participant: We were talking about EastEnders half the people smoke, like the TV shows smoke and I was saying like well...how bad smoking is and that's why it came up.* (Zarina)

Doing homework which promoted a conversation about smoking,

*Interviewer: How did you pick your moment to tell her about smoking?*

*Participant: Um...she was...I went to her house and she was on the computer and she was doing some homework and when she was finished I told her about it because I saw she was doing facts about the hospital so I just told her about the smoking.* (Umar)

Speaking to a classmate in a Health and Wellbeing class when their topic was smoking and alcohol,

*xxxxx – I sit next to him in one of health and well-being classes. We were doing smoking and alcohol. You sort of bring it up and it's not just out of the blue with it. I told him about ASSIST cos quite a few of his friends had went as well. I don't think he would [smoke] anymore either.* (Ann)

Speaking to a family member when they were sharing their experience of a shisha bar,

*We were just talking and I think my sister brought up when she was...16 or something her and her friends went to I don't know what it called like a shisha bar and they used to smoke the...yeah she was talking about the other girl how she*

*used to like smoke it a lot. So then I said you know it's not really that good for you even though there's like fruit flavours and stuff, it's not really going to benefit your body or yourself and then my mum kind of just listened. She didn't really ask a lot of questions but she was kind of surprised when I told her what was inside cigarettes.* (Alia)

### 8.2.2.3 *Alter led conversation initiation*

So far, a picture has emerged where conversations were initiated by the peer supporter. However, there were occasions when conversations were prompted by someone else, usually a family member. For example, to attend the two-day training course peer supporters needed a consent form to be signed by their parent or carer. This often led to a discussion about what the training was about and then a follow-up conversation (after the training), which prompted discussion about smoking.

*Interviewer: Let's talk about mum so you've had a conversation with her. Tell me a bit about that?*

*Julie: Um...well she had to sign the form for me to go so then she was asking about what it was when I went to the thing. And I was telling her like all the different things we learnt like why smoking is bad for you, and why you shouldn't be smoking and what...how it will affect you now and in the future.* (Julie)

Similarly, a further example was a parent/carer asking their child how their day had been, which led into a discussion about the training and a wider family discussion about smoking.

*They [parent] said how was your day and I was like it was good.... and I was kind of talking to my little sister and my big brother at the same time... and then they [whole family] all joined in.* (Susan)

Other examples included siblings asking peer supporters why they were going to school in their 'own clothes' (i.e., not school uniform)

*Interviewer: What about...this one is your sister tell me about that one [conversation]?*

*Julie: Um...well I was talking to her about the thing [ASSIST] because she was confused because like we got to wear our home clothes so she was like why do*

*you guys get to where your home clothes when we have to wear our uniform? So I was talking to her about like what we did in the training and things, and like the different games. And the facts that we were...yeah...* (Julie)

The spontaneous nature of these conversations may have made them easier to initiate because they were unprompted and unplanned and peer supporters did not need to plan conversations in advance. This provides some explanation of findings in Chapter Seven, which showed that over half of conversations were with family members.

### **8.2.3 Where and when conversations took place**

Having explored factors that influenced who peer supporters spoke to and how conversations were initiated this final section on conversation context, focuses on where and when conversations took place. As would be expected conversations with school peers took place in school and the surrounding environment (e.g., in class, during breaks, on the bus/walk to school). For example, Julie explained that she spoke to one of her alters while waiting at the bus stop to travel home from school. Despite already thinking that this was someone they wanted to speak to, the opportunity to initiate a conversation was spontaneous because the alter started to smoke a cigarette while waiting on the bus home,

*It was like...because we were outside where the bus stop is in front of the school and we were just sitting there and he was like smoking, then when he was done I just started talking to him about it.* (Julie)

In contrast, conversations with family members tended to be at home or in the car. Conversations generally took place shortly after the two-day training, where peer supporters would share the smoking facts they had learned with peers in class once they returned from training or family members at home. This was illustrated by Susan who described a conversation she had with her cousin (who she lived with) after the two-day ASSIST training

*Well...when I came back from the [training]...I was like...you'll never believe this and then I told him [about the ingredients in a cigarette]. He said oh okay sure! He did not believe me.* (Susan)

### 8.3 Conversation content

Attention now moves from conversation context to explore conversation content - i.e., what messages did peer supporter diffuse to their alters? As illustrated in the quotes from the previous section conversation content varied - sometimes it was pre-planned and tailored, other times it was spontaneous and unplanned. Despite this variation in approach, conversations shared the same overarching purpose of trying to **protect** alters from the health harms associated with smoking. There were three dimensions to this protection theme. The first, was protecting the individual they were speaking to by preventing them from smoking in the first place. A common approach peer supporter used was to draw on the learning they had acquired regarding the 4,000 chemicals in a cigarette. Another approach was to target alters who were currently not smoking but the peer supporter had a concern that they might be at risk of smoking in the future. An example comes from Amy who described a conversation with her brother Colin, currently a non-smoker and whom she wanted to protect from starting to smoke.

*Interviewer: Then we've got Colin, your big brother. So tell me about the conversations you've had with Colin.*

*Participant: My conversation with Colin is trying to make sure he doesn't go down the route of smoking and trying to keep him away. He's getting older and he probably will try smoking. I want to try to make sure he doesn't. (Amy)*

The second dimension to the overarching theme of 'protection' was conversations with smokers and trying to encourage them to stop. Once again the fact about there being 4,000 chemicals in a cigarette was used, but so too was the more direct approach of using 'shock tactics'. Angela described how she approached a conversation with her Aunt who had been hospitalised as a result of smoking.

*Participant: Um...she has been in hospital quite a lot because she's had asthma attacks due to her smoking as well. So I kind of like just tried to give her information because I really want her to stop so I've been kind of trying to persuade her and stuff, try to not smoke so I've been trying to give her like kind of the more...like...the more...gruesome effects. Like the more...like horrible facts like that it could kill her and stuff so...it sounds horrible but I just really want her to stop because I don't want her in hospital again.*

*Interviewer: So what made you think that telling her the gruesome facts would be the best approach, what was it about that?*

*Participant: Because like...she's quite...like persuasive like if you told her something she might like take it in and actually do it. So like I thought I would say to her like the more...you could save a lot more money and that you could die like a lot earlier and stuff. She was really interested in it and like I think...I'm not sure like...after it she kind of just looked really worried and stuff so yeah.*

*(Angela)*

The latter part of this quote ‘*she kind of just looked really worried and stuff*’ – raises an important ethical dimension regarding wider message diffusion in social networks. In particular is it acceptable/desirable to cause fear in alters who smoke? Linked to this, is a wider point about peer supporters’ diffusing misinformation, especially with regard to electronic cigarettes. For example, Angela also spoke about a conversation with her Grandparents about electronic cigarettes and told them they were just ‘as bad as a normal cigarette’, which is not substantiated by the current evidence base (Board on Population Health and Public Health et al., 2018)

*Participant: Um...I said to...my nana was smoking a E-cigarette and I was saying like how dangerous that one is, it's just as bad as a normal cigarette and she...I said that to my granddad as well and my granddad didn't look that bothered because he thought it was safer and I was trying to explain to him that it's still got nicotine in it and if you over charge it and stuff it could kind of like blow up.*

*Interviewer: And where did you learn that from?*

*Participant: Um...I've seen quite a few things on Face Book but I seen it on the ASSIST thing as well.”*

*(Angela)*

The third dimension was to protect, not just the alter but, other people around them by sharing the dangers of second-hand smoke. For example, Amy described a conversation with her older brother Liam who was a smoker and also a father to his young son. Her aim was to protect his son (her nephew) from second-hand smoke

*Interviewer: “Let’s talk about Liam – that is your eldest brother – cos he’s got a red and a blue dot. Can you remember what the conversation like? What did you speak about?”*

*Participant: Trying to get him to stop, because he’s got a two-year-old now. When my sister-in-law was pregnant with the baby – she used to smoke, but she stopped smoking because she was having him, then he stopped for a while when she was*

*pregnant, but then went back. It's trying to get him to stop again, cos if he's done it once he can do it again."* (Amy)

In addition to the overarching theme of protecting alters from smoking harms, there was a further theme centred around peer supporters offering one another emotional and practical support. Emotional support included sharing anxieties regarding their peer supporter role and offering one another reassurance that they were going to be able to do it. Girls were more likely to draw on this kind of support than boys. Whereas practical support centred on swapping and checking facts they had learned in training as well as how to initiate a conversation and who to approach.

*Interviewer: So then so we've got xxxx your friend who is also a peer supporter so you've had a conversation or conversations with her?*

*Participant: We were saying like both....the interesting facts we thought...each other like um...like the...I'm trying to think of the facts. The...um...one where it was like Ready Steady Cook and it was like the tar and liquorice and stuff. And she thought it was interesting how you've got like vanilla and cocoa in cigarettes and you wouldn't normally think they were in it. So...* (Angela)

These conversations were included in the overall total number of conversations discussed in 7.3 and could be perceived as overestimating the extent of ASSIST anti-smoking message diffusion. However, I would argue that these are still valid conversation for two reasons. First as illustrated above by sharing key facts with one another peer supporters were consolidating their smoking harms knowledge which is a key objective of ASSIST. Second, by having these conversations they may help to boost peer supporter confidence to diffuse anti-smoking messages, which is crucial to the success of the ASSIST intervention.

#### **8.4 Perceived influence of conversations**

Chapter Seven reported that the majority of peer supporters perceived that their smoking conversations had resulted in some sort of influence with around one third (36.9%, n=38) of the alters they had spoken to, most of whom were family members. However, it lacked detail on what kind of influence this was and whether it was positive or negative. Exploring this further is the purpose of this section.

### 8.4.1 Positive perceptions of influence

Positive feedback was presented in two ways. First, was the cascading of message diffusion to wider networks - where peer supporters would disseminate information to alters who would then pass it onto to people in their own networks. Two examples of this kind of wider diffusion came from Zarina and Ellie. First, Zarina described how she had shared information with her younger sister who then shared this information with her friends, with Zarina describing her sister as '*another peer supporter for her friends.*' Ellie explained how her best friend intended to share the information she had learned from their smoking conversation.

*Interviewer: Tell me about the conversation with [best friend].*

*Participant: She asked me how it went [the two training] and I said do you know that there are over 4000 chemicals in a fag? She was like, no. I was like, it contains vanilla and rat poison [arsenic]. She was like, that is disgusting. She said I'm going to tell my mum and dad that, cos her mum and dad smoke.*

*(Ellie)*

Second was a change in alter smoking behaviour, knowledge or attitudes. This was discussed in three ways. First, as illustrated by the quote below from Julie, was a greater awareness of the health harms associated with smoking.

*Interview: And so you've given her [family member] a blue dot as well so you think that might have had some sort of influence, can you tell me a bit more about what influence you think it might have had?*

*Participant: Um...because now she knows that like...she knew smoking was bad in the first place but now she knows it's worse than she thought it was. (Julie)*

Next was a change in alter smoking behaviour, as illustrated by Ann who described how she felt the conversation she had initiated with her Gran had improved her Gran's awareness of the dangers of smoking and this had encouraged her to cut down her cigarette consumption.

*Interviewer: So let's talk about your gran, xxxx. Tell me about that conversation.*

*Participant: She's smoked for years – over forty years. She said it would be a hard habit to stop. But she's cut right down now, so talking to her about it, she's trying to stop.*

*Interviewer: Do you think she has cut down and tried to stop as a result of you speaking to her?*

*Participant: Yeah*

*Interviewer: Tell me a bit more about that.*

*Participant: Yeah. I go down quite a lot through the week, so usually whenever ...she always has half a cigarette, so she's trying to cut down every time she has one as well. I was telling her about the dangers and she didn't know some of them. She didn't know there was rat poison in them. So that kind of put her off it.*

*(Ann)*

A further example comes from Amy, whose description of the smoking conversations she had with her father indicated that, despite not having an impact on the number of cigarettes he consumed, it may have contributed to a greater awareness of the health harms associated with second-hand smoke as she noted that he would sometime smoke outside away from herself and her siblings.

*Interviewer: What does he [dad] say when you have these conversations?*

*Participant: He really listens to it. I feel like he tries to stop but it's just hard and he always goes back. Sometimes it makes him look into different views and sometimes instead of sitting having a smoke around us, he'll go out and stand out the back or at the window.*

*(Amy)*

Finally, was the realisation that by having conversation with someone who did not smoke might delay or prevent them smoking later, as illustrated by Alia who described a conversation with her little sister

*Interviewer: Was there any other reason why you think it might have had an influence on her?*

*Participant: Maybe for her not to smoke maybe when she's older, later on. (Alia)*

#### 8.4.2 Negative perceptions of influence

Despite peer supporters generally reporting that their conversations were well received, there were occasions where peer supporters felt conversations had not been a positive experience. Reasons for this centred on alter response to the conversation, which were described as patronising, hypocritical or apathetic. For example, Michelle explained how she had a conversation with her mother, telling her how bad smoking is and expressing her concern that it could cause her mother to die prematurely. Unfortunately, Michelle's perception was that her mother did not take any notice because she laughed at her.

*I just kind of like told her that she should stop smoking because it's really bad and I wouldn't want her to pass away prematurely. But...I don't think she took notice of that, she just kind of laughed at me.*  
(Michelle)

Michelle, also described her father as being a 'hypocrite' because he was pleased that she was taking part in ASSIST because he did not want her to smoke but showed no inclination to stop smoking himself.

Examples of alter apathy were also found with friends and family members. Ann described how she spoke to her father and uncle about being a peer supporter and what she had learned while they were watching the television. This resulted in zero conversation, and so Ann concluded that they were not interested. She also made the wider point that this tended to be a common reaction, regardless of what the topic of conversation,

*Participant: That's every conversation with my family nobody's interested in anything!*

*Interviewer: Okay. Nobody is interested in anything about smoking or -*

*Participant: About smoking but like other conversations, sometimes it's the same.*  
(Ann)

Amy described speaking to a school friend (positioned on the outer circle so not that close) whom she felt was not really listening or interested in what she had to say.

*Interviewer: Tell me about the conversations you've had with Leoni.*

*Participant: Just trying to make sure she doesn't go down the wrong path and try to make sure she doesn't try it and end up in a bad position.*

*Interviewer: How did that conversation go? What do you think she felt?*

*Participant: it feels like, sometimes she's listening, but she's not listening. It's just like she doesn't care.* (Amy)

Peers supporters also described how some of the conversations with their peers made them feel like the person they were talking to had an attitude or was trying to act cool in front of their friends so the peer supporter was not sure if they were listening to them. For example, Yusuff described a conversation with one of his close friends, Euan (who was not a peer supporter). Yusuff was telling Euan about his peer supporter role and sharing some of the facts he had learned. Yusuff explain that his friend Euan appeared uninterested and replied in a sarcastic tone,

*He was like alright Yusuff alright good for you. He tries to act cool and that.* (Yusuff)

Two slightly more worrying examples of negative alter reactions came from Amy and Louise. Amy described how her parents were supportive of her being a peer supporter but became irritated when she 'babbled' on about her facts.

*They think it's good, but they can get annoyed when I come and just sit and babble about it.* (Amy)

Louise spoke about how she had decided to speak to a peer who she used to consider her best friend, but unfortunately her reactions to conversation was not what Louise had hoped for, which contributed to the decline of the friendship. This alter was not placed on any of the circles on the map, but instead placed on the bottom left corner, showing clearly and very visually where this alter lay.

*I just tried to tell her that it [smoking] wasn't good for her. She knows it's not good for her, but she wasn't too bothered. She promised me before, that she would stop doing it, but she never did. She has tried to. There was a time when we were best friends and she did stop cos she knew I didn't like it. But she done it behind my back and that is one of the reasons we fell out.* (Louise)

## 8.5 Peer supporter perspectives on conversation initiation and delivery

Discussion so far has focused on whether peer supporters perceived their smoking conversation to have been positive or negative, with limited discussion of how the peer supporter felt initiating and conducting the conversion. This is the focus of this last section. Naturally if the conversation had been well received peer supporters felt happy and pleased.

*Interviewer: And how do you feel when you're having the conversations with people?*

*Michelle: I feel like...I feel like I'm doing a good thing for them, letting them know that it's not cool to smoke.*

*Interviewer: So how does that make you feel knowing that you might have had a positive impact?*

*Michelle: Happy because he would be healthier and he would live a bit longer.*

*(Michelle)*

In contrast when conversations were perceived negatively by peer supporters (e.g., not gone very well or had limited or little influence) peer supporters reporting feeling sad, angry, annoyed or disappointed because they felt they were not being listened to. Interestingly examples of these feeling were mainly confined to older family members, not friends.

*Interviewer: Are there any conversations that you've had that you felt didn't go very well?*

*Participant: Some of my dad's cos he's just not budging.*

*Interviewer: So how do those conversations make you feel?*

*Participant: Sad and angry. A wee bit disappointed. With xxxx [brother aged 27] you'll always have an argument about it. He'll always have a reply to everything you say. So it's trying to get him to listen to what you're saying and it's quite hard sometimes.*

*Interviewer: So how did that make you feel?*

*Participant: Kinda annoyed.*

*(Amy)*

A further example comes from Clare who explained that her dad had not listened to what she was telling him about smoking, this caused frustration because she wanted him to listen to something which she knew was important.

*Interviewer: Yeah and what about when your dad wasn't that bothered how did that make you feel?*

*Participant: Quite um...annoyed basically, just like...how I'm talking to him and he's not listening and it's something important that he should know. (Clare)*

Despite sections of the peer supporters training equipping peer supporters with the skills to initiate a conversation and to be prepared for conversation outcomes that they may find disappointing; the above examples highlight the emotional load the role could have on a young person. Having to process feelings evoked from a negative response to a conversation adds to the potential anxiety that a peer supporter could face. Currently there is a lack of research exploring this in detail, with findings from this exploratory study suggesting that it is an area requiring further investigation.

## **8.6 Summary**

This chapter has drawn on the qualitative data collected when creating peer supporter sociograms to explore the context and content of message diffusion. Exploring the context of message diffusion points a lens on the peer support role, highlighting that it requires not only the confidence to initiate a conversation, but also prior thought and planning to identify who to speak to and how to engage them in conversation. It is important, therefore, to acknowledge that the peer supporter role asks a lot of students, which for some could be considered overwhelming and daunting. None of the students in this sample explicitly expressed these feelings but they did share concerns around how they would be received by their peers and whether they would be ridiculed or ignored.

Findings from this chapter suggest that conversation initiation may have been easier with family members, especially parents and siblings who peer supporters live with and, therefore, interact with more than peers at school. Added to this is the practical requirement that parents/carers were required to give their consent to attend the two-day training which would prompt a conversation about what they have learned. This, perhaps, made conversation easier to initiate because it required less advanced thought, unlike with their peers. These findings offer some insight into why peer supporters were more likely to have conversations

with their family members than friends (discussed in Chapter Seven). Future delivery of ASSIST (or health behaviour change interventions based on the ASSIST model), should consider whether active promotion of message diffusion into wider social networks would be beneficial to help build peer supporter confidence to enable them to approach their school peers, but also to broaden intervention reach.

Conversation content took a variety of forms with a mixture of spontaneous and pre-planned, tailored, conversations to resonate with the person they wanted to engage with. One particular approach was the use of 'fear appeal' or 'shock tactics', which raises ethical concerns around the appropriateness of this approach, especially as the existing evidence questions the effectiveness of this approach (Green, 2015, Ruiter et al., 2014). Findings also demonstrated that peer supporters could view the conversations they had as positive or negative. One area of particular interest was where the peer supporter spoke to an adult and reported feelings of not being taken seriously or being ignored.

A key strength of the findings included in this chapter is the depth of understanding in relation to context and content of message diffusion. However, a limitation is the lack of voices from the alters themselves. As discussed in Chapter Six, effort was made to try and include their views but unfortunately no one consented to participate in an interview. This means that there is a lack of perspective regarding the approach used to diffuse information and what influence this may have had. Instead, there is a reliance on peer supporter perception of influence on someone else, which will be one sided. In addition, a further limitation is that due to the school timetable data collection took place during the third and fourth follow-up which is approximately six to ten weeks after training. This may have affected peer supporter recall when discussing their conversations.

# Chapter 9: Discussion

## 9.1 Introduction

The aim of this thesis was to determine whether an adolescent smoking prevention programme called ASSIST had the potential to influence smoking behaviour, attitudes, and knowledge of smoking related harm beyond the school year. In this chapter I will demonstrate that findings from this thesis, not only make a contribution to the future delivery of ASSIST (and variants of the model to accommodate other risk factors), but also to complex health behaviour change intervention design and conducting research with adolescences using novel and visual approaches. This chapter begins with a reminder of the thesis rationale, aim and research questions.

## 9.2 Rationale, aim and research questions

Despite the continued decline in youth smoking in Scotland, adolescent smoking prevention continues to be a public health priority for several reasons. Children are still experimenting with smoking, which significantly increases their likelihood of becoming a regular smoker in late adolescence, particularly for those living in deprived communities, where smoking prevalence is higher (Glenn et al., 2017, Pampel et al., 2014). Children who smoke can suffer asthma, lung function and lung growth impairment and other chronic health outcomes in adulthood such as cancer, heart disease or chronic obstructive lung disease if they continue to smoke. Due to the association between early tobacco use and tobacco dependency, the health harms associated with tobacco increase the earlier smoking uptake occurs (Muller, 2007, Turner-Warwick, 1992).

Schools continue to be a particularly popular setting to deliver youth smoking prevention interventions, however, evidence of the effectiveness of such programmes is mixed and dated (Thomas et al., 2013a). ASSIST is in the unique position of being one of a few school-based, peer-led, smoking prevention programmes that has been shown to be effective in reducing regular smoking in adolescents (Campbell et al., 2008). A further unique aspect of ASSIST is that it is an example of an evidence-based, social network intervention targeting young people. Interest in social network interventions has grown in recent years, where social networks are used to create or promote health behaviour change. However, despite a robust evidence base supporting the implementation of ASSIST it is predominantly focused on delivery within

schools only. This means that there is only a limited understanding of the extent and context of message diffusion beyond the school year and into peer supporter's wider social networks. This thesis sought to address this gap by exploring the extent, nature, content and perceived influence of message diffusion beyond the school year. In addition to this epistemological contribution, the thesis also sought to make a methodological contribution to qualitative social network research. This was through the development and testing of a novel, visual approach to collecting and interpreting social network data from adolescents. It also piloted a novel approach to the recruitment of alters for interview.

This thesis consisted of two parts. Part one (Chapters Two, Three and Four) reviewed the literature to identify an appropriate area for investigation and inform the research design for the empirical study. For example, findings from my systematic review (Chapter Three) highlighted two key points that informed the thesis aim and research questions discussed in 5.3.1. First, despite social networks featuring in the included studies for both the 2009 (Bauld et al., 2009) and 2014 update (Dobbie et al., 2018), their contribution was not explicitly discussed, and authors did not use social network terminology or label their intervention as a 'social network intervention'. For example, the 2009 review noted an implementation barrier was intervention delivery to students whose peer group comprised of experimenters, occasional or regular smokers, or who lived in households with smokers or in a local community with a high smoking prevalence. This illustrates the importance of social networks, yet it was not drawn out as a discussion point. Likewise, the 2014 update (Dobbie et al., 2018) included the X:IT study (Andersen et al., 2014a) which had an explicit design component where parents had to engage in smoke-free discussion at home. Using Valente's (2012) taxonomy of network intervention this an example of an 'induction' approach which promotes the cascading of information through networks. Yet the authors did not label their intervention as a network intervention when in fact it was.

Second, a further finding from the 2014 update (Dobbie et al., 2018) is that none of the studies included for full review looked at the influence of school-based smoking prevention interventions on the wider networks of students (i.e., their friends and family).

These evidence gaps helped identify my overall thesis aim, which was to explore whether ASSIST has the potential to influence smoking behaviour, attitudes, and knowledge of smoking related harm, beyond the school year.

Part two (Chapters Five to Eight) was dedicated to the design, analysis and presentation of findings from the empirical data study in order to answer the following research questions:

1. What do the social networks of ASSIST peer supporters look like?
2. What is the potential extent of message diffusion in peer supporter networks and how does this compare with the actual extent of message diffusion?
3. What factors influence who peer supporters choose to speak to/not speak to about smoking and what are the reasons for this?
4. What is the context in which conversations take place and their content? (e.g., where and how conversations are initiated, what communication methods are used, what is discussed?).
5. How do peer supporters feel about initiating and having informal conversations about smoking?
6. What perceived influence, if any, do peer supporter conversations have on smoking behaviour, attitude and knowledge of social network members?
7. What are the implications and recommendations for any future delivery of ASSIST, specifically, and network intervention science more broadly?
8. What are the methodological contributions to qualitative social network research in general and working with young people in particular?

The remainder of this chapter is comprised of five sections. Section 9.2 will consider the **key findings** from the thesis and their broader contribution to knowledge beyond ASSIST. The focus of section 9.3 is the contribution this thesis has made to **research methods** where the novel research method and pilot test of a respondent driven recruitment method will be discussed. **Strengths and limitations** are then considered in 9.4. The remaining three sections will focus on: **reflections on the research process** (9.5); **implications and recommendations** (9.6); and **conclusions** (9.7).

## 9.2 Key findings

The focus of this section is to present the key findings from this thesis in relation to the first six research questions (RQs) which this thesis sought to address. Sections 9.2.1 and 9.2.2 address research questions 1 and 2 by considering both the potential and actual extent of message diffusion. Section 9.2.3 considers conversation content and context and speaks to research questions 3 & 4. Finally, section 9.2.4 focuses on research questions 5 & 6 by looking at perceptions of influence and peer supporter feelings about their role. Research question 7

is the focus of the implications section 9.4 and research question 8 is addressed in section 9.3 (methodological contribution).

### 9.2.1 Potential for broader diffusion beyond the school year

Given the overall aim of the thesis, developing an understanding of the size and composition of peer supporter social networks was an important starting point. This analysis gave an indication of the potential for extended reach if peer supporters were encouraged to speak to **anyone** in their social network, not just peers in their own school year (as was the instruction given to students when fieldwork took place).

Chapter Seven used 'formal' (i.e. quantitative) social network analysis to create a picture of peer supporter networks. This analysis started by looking at the size of peer supporter networks to assess the **potential** for message diffusion beyond the school year. Results indicated that peer supporter networks (from this small experimental study of 16 peer supporters) were fairly large with a total of 151 alters added to peer supporter sociograms. The smallest networks comprised six people (alters) and the largest 14. However, these alter nominations were in response to a specific name generation question (discussed further in 9.3.) and, therefore, do not give a definitive count of the actual size of their network. This means that the total number of alter nominations is most likely an underestimate because it did not include all the people that peer supporters knew.

Despite this caveat, findings from Chapter Seven, which looked at the **potential** for extended message diffusion, found that peer supporter networks comprised of more non-school friends and family members than school year friends. For example, the majority of alters nominated by peer supporters were non-school friends or family members (64%, n=97), with just over one third (36%, n=54) being school year friends. This suggests that there was untapped potential to extend the reach of message diffusion into peer supporter's friends and family out with their school year that, could result in a wider influence on smoking attitudes and behaviour. Further, results from the systematic review highlighted findings from Small et al (2013) who noted the importance of parents and society to encourage smoking prevention (3.5.3.1).

These findings suggest that the current delivery model of ASSIST is, potentially, missing a significant opportunity to promote the extension of message diffusion into peer supporter wider social networks. This potential (for greater message diffusion) may be transferable to any

health behaviour change intervention using the ASSIST model and is discussed further in the implications section.

### 9.2.2 Actual extent of message diffusion

Having clarified that peer supporter networks could potentially support the extension of message diffusion beyond the school year, in the analysis I then sought to find out if peer supporters were having smoking conversation with members of their broader social network, and if so, with whom? Answers to these questions came from Chapter Seven which reported that peer supporters had a total of 103 smoking conversations, which was two thirds of their social network (66.5%). When this figure was broken down to look at whom peer supporters had a smoking conversation with, it became apparent that they were more likely to speak to their non-school year friends and family members, rather than their school year friends. Three fifths of conversation were with non-school friends or family members (59.2%, n=61) and two fifths (40.8%, n=42) with school year friends. Despite variation in the number of conversations at the individual peer supporter level (which ranged from 1 to 11), these findings suggest that peer supporters were actively engaging with their networks and diffusing the knowledge they had acquired from taking part in ASSIST. As would be expected peer supporters with larger networks were more likely to have more smoking conversations with their alters, than those with smaller networks.

These findings are important for two reasons. **First**, despite peer supporters not being explicitly instructed to do so, they were actively engaging in smoking conversation with members of their social network out with their school year. This is the first time qualitative data has been systematically collected using social network research to illustrate the extent of ASSIST message diffusion from the peer supporter perspective. This means that message diffusion can extend beyond the peer supporter school year and filter into their wider social networks. This is highly relevant not only to the future delivery of ASSIST but also to other health behaviour change interventions that have adapted the ASSIST model (e.g. FRANK, STASH, PRoGRAM-A, discussed previously in 1.6). However, none of these adaptations (except PRoGRAM-A, which is currently in the development phase) have made purposeful attempts to encourage message diffusion beyond the peer supporter school year.

This is the first study of ASSIST to present evidence suggesting that peer supporters were more likely to initiate conversations with people out with their school year. This supports a key argument of this thesis – that ASSIST (and interventions using a similar approach) should

consider encouraging (and supporting) peer supporters to choose who they would like to initiate a smoking conversation with in their broader social networks (i.e. not just peers in their school year).

**Second**, previous evaluations of ASSIST have not looked at the extent of message diffusion beyond the school year, but they have measured diffusion between peer supporters and students in the same year group. For example, the 2008 definitive RCT evaluation of ASSIST, reported findings from the student survey that found 23.8% of students who took part in the self-complete survey said that they remembered having a conversation with a peer supporter (Campbell et al., 2008). More recent data comes from the 2014 the process evaluation of the pilot delivery of ASSIST in Scotland which reported a much lower figure of 9% when the same question was asked (Dobbie et al., 2019). This reliance on student self-report data to capture the extent of message diffusion has been criticised by Audrey et al., (2006) because it is dependent on students remembering the interaction, which could be challenging when the follow-up data was collected at the end of the delivery cycle of ASSIST, which can be anything between 10 and 14 weeks. A further criticism of this approach, is that due to the nature of ASSIST delivery, students who are not peer supporters are not explicitly told about ASSIST and may not know that they had spoken to a peer supporter.

Despite message diffusion findings from this thesis not being directly comparable with the ASSIST evaluations noted above (due to differences in mode of data collection, sample group and sample size), they do highlight the stark difference in perceptions of message diffusion when considered from the peer supporter and alter perspective (i.e. peer supporters reported higher levels of message diffusion than students). Thus, the existing ASSIST evidence base can be criticised for its reliance on self-report data from a student survey to examine the extent of message diffusion and not directly asking peer supporters about whom they had spoken to. In order to understand the extent of message diffusion more fully it is important to include perspectives from peer supporters as well as their alters.

However, it is important to bear in mind that the primary outcome measure for the 2008 definitive trial of ASSIST was to measure change in smoking prevalence in the past week in the school year group, not the extent of message diffusion. It should also be noted that ASSIST message diffusion is reliant on informal conversations between peer supporter and their alters, which make any attempts to accurately measure the extent of message diffusion challenging, if not impossible. Future delivery of ASSIST (and other interventions using this model) should seek to investigate this further and I suggest ways this could be achieved in section 9.4.1.

### 9.2.3 Peer supporter conversations

As noted in 1.4 there are many benefits to using peer education approaches for health promotion, but there is also potential for some burden associated with the role (Milburn, 1995, Audrey et al., 2006). For example, Milburn (1995) notes the ethical dilemma of expecting peer educators to instigate health behaviour change, when the social and environmental factors that influence that behaviour are out with their control. Further, Layzer et al., (2017) notes the additional work and time commitment the peer supporter role can place on the young person, who has to make up for the class work they miss in their own time (Layzer et al., 2017). Ochieng (2003), notes the importance of personality traits (e.g. being shy) of the peer educator, which could influence how comfortable and confident they feel about executing their role.

Similar parallels were found with peer supporters who took part in this study. For example, they were required to have not only the confidence to initiate a conversation, but in some instances, the foresight to think about who to speak and plan how they would engage them in smoking conversation. In addition to this, peer supporters were also required to remember their peer supporter role and pro-actively engage in opportunities to initiate a smoking conversation, whether they presented themselves spontaneously or were pre-planned. Peer supporters also had to decide who to approach or not, think about what facts they would use and acknowledge the uncertainty of not knowing how the conversation would be received. When viewed from this perspective it is evident that the peer supporter role asks a lot of students, which for some could be considered overwhelming and daunting. None of the students in this sample explicitly expressed these feelings, but they did share concerns around how they would be received by their peers and if they would be ridiculed or ignored. However, the national evaluation of the ASSIST pilot in Scotland did report occasions where peer supporters felt 'nervous' and 'apprehensive' about initiating a smoking conversation after their training (Dobbie et al., 2017). This emphasises the importance of the follow-up sessions and the ongoing support available to peer supporters.

Feedback from some peer supporters also highlighted the amount of prior thought and planning necessary to identify **whom** to speak to and how to engage them in conversation. Despite this being an obvious and important part of the peer supporter role (i.e. thinking about **whom** to speak to) it did not appear to be given much prominence in the ASSIST Scotland peer supporter training. For example, my review of the delivery manual used for the ASSIST Scotland pilot in 2014 identified a training session called 'How, when and where?' which helps peer supporters to think about how to start a conversation. However, in addition to helping

peer supporters think about how, when and where to start a conversation I suggest that they should also be given guidance to think about with **whom** they could initiate a conversation.

As noted, previously the evaluation of ASSIST in Scotland found that the extent of message diffusion was low (Dobbie et al., 2019). Part of the explanation was due to a reduction in adolescent smoking prevalence discussed in Chapter Two, but it may also be due to peer supporters simply forgetting to initiate a conversation because they had not explicitly thought about whom to approach. Peer supporters could, potentially, be less likely to forget about their role if they were given the time and tools to think about who to approach during their training days and follow-up sessions. Adapting the sociogram technique used in the fieldwork for this thesis could be any easy route into this. Further details of how this could work in practice is considered in section 9.4 (implications).

Thus, peer supporters may forget their role and engage in fewer conversations because they have not been supported to think about how and **whom** to approach as part of their training.

Conversation content centred on peer supporters trying to protect members of their network from the health harms associated with smoking. Approaches to initiate conversations took a variety of forms. Peer supporters used a mixture of content that was spontaneously thought of or pre-planned and tailored to resonate with the person they wanted to engage with.

One particular approach was the use of ‘fear appeal’ or ‘shock tactics’. Although not encouraged by ASSIST, the use of ‘fear appeal’ or ‘shock tactics’, was reported as a deliberate approach to initiate a smoking conversion. Findings from Chapter Three (3.3.6) and existing literature on the effectiveness and appropriateness of health promotion initiatives that include fear or ‘shock tactics’ is mixed with Green et al., (2015) noting that,

*“The use of fear appeal in general – and for health promotion in particular is still highly controversial, both regarding the ethics of its use and its relative effectiveness.”*  
(Green et al., p. 353)

A critical review of the use of ‘fear appeal’ used in health promotion initiatives conducted by Ruiter et al., (2014) concluded that it was a false belief that the use of fear appeal could facilitate positive health behaviour change. Further, Greene et al., (2015) and Ruiter et al., (2014) note that the existing evidence base of fear appeal was methodologically weak to provide any clear guidance regarding effectiveness. Aside from the limitation regarding effectiveness, the broader ethical question remains; should ‘fear appeal’ or ‘shock tactics’ be

used to change behaviour? In the context of the future delivery of ASSIST, which could include diffusion to wider social networks, careful thought is required in terms of message delivery and appropriate ways to diffuse information. It also creates debate as to whether peer supporters should be guided away from using shock tactics, or whether this should be at the discretion of the peer supporter? My review of the ASSIST Scotland delivery manual suggests that peer supporters were given no guidance on whether the use of fear or shock tactics was acceptable or not.

A further dimension related to conversation content centred on peer supporters offering one another support. This could be emotional (e.g. sharing anxieties about their peer supporter role) or practical support (e.g. swapping and checking facts they had learned in training as well as how to initiate a conversation and whom to approach).

The range of approaches to initiate a conversations and the thought processes involved to structure a conversation as well as the confidence required, can all be viewed as essential elements that 'scaffold' the role of the peer supporter and help to fulfil their role, which is to discuss anti-smoking messages among their peers. This approach is supported by Jerome Bruner's Theory of Scaffolding, which originated in 1976 informed by the work of Lev Vygotsky, a Russian psychologist who developed the Zone of Proximal Development (ZPD) theory (Lai and Law, 2006, Wass et al., 2011, Vygotski, 1978). The ZPD refers to what an individual can achieve by themselves (i.e. without help) versus what they can achieve with help. Vygotsky argued that the optimal learning environment is through interaction with a 'more capable peer' i.e. someone with knowledge and skills that another individual does not yet have. As defined by Vygotsky the ZPD is

*"the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem-solving under adult guidance, or in collaboration with more capable peers"*  
(Vygotsky, 1978, p. 86)

Wass et al., (2011) note that Vygotsky never defined what a 'more capable peer' was but suggests that it could refer to someone from their peer group, other students, teachers, lecturers and researchers. Bruner's scaffolding theory can be viewed as a tool to help the 'capable peer' move the individual into the ZPD. This is achieved by a teacher (for example) offering support to a student (for example) when they are introduced to a new topic, concept or task. Initially, the student will rely on the teacher for support but this will gradually fade as

they acquire more knowledge, confidence and better understand the task or concept. This interaction can metaphorically be viewed as the scaffolding that supports a building which is removed once the structure is stable and support is no longer required.

Scaffolding theory can be aligned to ASSIST with the trainers the 'more capable peer' who equip peer supporters with the knowledge (scaffolding) about smoking which students then diffuse through their networks. Trainers add further scaffolding by equipping students with the personal and social skills to plan and initiate a conversation and offering ongoing support through the 12-14 week delivery period. Teaching staff also provide scaffolding by encouraging students to take part and offering support in between follow-up sessions with trainers. The peer supporter then creates their own scaffolding by thinking through: 1) who they will/will not speak to and why and; 2) how they will initiate a conversation and what the conversation content will be in advance. They also draw on support from other peer supporters by sharing experience of conversations they have had and plan to have in the future. Holton and Clark describe this as 'reciprocal scaffolding' where small groups work together for mutual support and learn from one another's knowledge and experience, thus providing their own scaffolding and becoming a collective group of 'capable peers.' For example, Chapter Eight, discussed the apprehension one peer supporter felt to initiate a smoking conversation with a peer who she suspected was a smoker, but lacked confidence to approach her and start a conversation because she did not know her that well. Her strategy to overcome this was to ask for support from a fellow peer supporter to come along with her and speak to the alter.

#### **9.2.4 Perceptions of influence**

When peer supporters were asked to reflect on whether any of their conversations had resulted in some kind of influence on their alters, their feedback suggested that of 103 conversations recorded, just over one third (36.9%, n=38) were perceived by peers supporters to have had some sort of influence. Perceptions of influence were reported to be higher among peer supporters with larger networks and among alters who were male. Despite the 13-15 age group being the most common age group for an actual conversion (47.5%, n=49 of the 103 reported conversations), perceptions of influence were low at 29%.

Analysis of the qualitative narratives that accompanied the ego sociograms indicated that peer supporters could view the conversations they had as both positive (if the conversation had been received well) and negative (if the alters had responded with disinterest or the peer supporter felt they been patronised). One area of particular interest was peer supporter experience of speaking to an adult, especially if they reported feelings of not being taken

seriously or being ignored. These accounts raise important ethical questions around the dynamics of a child speaking to an adult, i.e. where the child is clearly concerned about the welfare of their parent, which the parent then dismisses or ignores. As noted by Rowa-Dewar et al., (2014), this could be a result of the parent/carer not seeing their child as an authority figure or thinking that it is not the child's place to offer advice about health behaviours to a parent:

*“Many parents were also described as relatively unaffected by their children’s attempts at challenging their smoking. The impact children had on smoking practices in the home and car therefore appeared to be constrained by parents’ greater power in the home, with most parents reported as resisting attempts at negotiation from their children.”* (Rowa-Dewar et al., 2014, p. 109)

These findings suggest that any future extension to the ASSIST programme to include peer supporter wider social networks would need to clearly articulate that it is up to the peer supporter to decide who they would feel safe and comfortable initiating a conversation with. By giving the peer supporter control over who in their social network they decide to speak to or not, could help to mitigate the potential for any negative consequences of a child speaking to an adult.

### **9.3 Contribution to research methods**

In addition to the key findings outlined above, this thesis has also contributed to research methods in two ways: 1) pilot testing a respondent driven recruitment approach; and 2) contributed the ongoing development of a novel and visual research method (i.e. incorporating egocentric sociograms into an in-depth qualitative interview) for data collection with young people. The contribution to respondent driven recruitment will be considered first.

#### **9.3.1 Contribution to respondent driven recruitment**

During their interview peer supporters were asked to think about who on their sociogram might be interested in taking part in an interview to explore their thoughts and experiences of ASSIST and the potential for wider diffusion. They identified potential alters using green dots. For peer supporters it gave them control over who they selected for follow-up, which may have helped to ease the power imbalance between the child (interviewee) and adult (interviewer) discussed in 5.3.2.1. However, because the sample of alters for follow-up was selected by the peer

supporters, the data they generated may be quite different to that if all the alters had been given equal chance of taking part.

Once peer supporters had made their selection they were given interview invitation letters which they were asked to hand over to their selected alters. Each invitation had the study information leaflet, consent form and a reply-paid envelope which they had to send back to the student. This 'opt-in' approach was a specific requirement for ethical approval and to also comply with data protection regulation. It, unsurprisingly, made the recruitment process more complex, and ultimately resulted in no alters volunteering for interview. In Chapter Six I offered some potential explanations for the lack of interest, but essentially this approach placed too much of the recruitment burden on the peer supporter, especially when other demands on their time from school, friends and home life are considered. Another factor is the inclusion criteria I applied that anyone peer supporters nominated had to be aged 16 or older. To include anyone under 16 would have meant obtaining parent/carer consent which would have added more complexity and add another burden onto the peer supporter.

As far as I am aware the existing ASSIST evidence base, or other studies that have adapted the model for other risk taking behaviour, have not attempted to elicit opinions from alters or use a similar RDR approach. In my previous longitudinal qualitative study of gamblers I used a similar approach but was able to contact the participants (i.e. the 'ego') by phone/text message to remind them to speak to their alters. This helped to generate some productive interviews but it still fell short of the target numbers (Reith and Dobbie, 2011). For obvious ethical and data protection reasons I did not use a similar strategy with the young people in this study.

Having piloted this recruitment approach, I would not recommend its use for future studies in its current form. An alternative approach that many have yielded more success would have been to ask the school to support alter recruitment. This could have been done in four ways. First, when the opt-out letters were sent to inform parent/carers that their child may be invited to take part in the study they could have been given an option to express an interest in taking part in an interview and give consent for their contact details to be shared. Second, once peer supporters had nominated their alters for interview, I could have asked to school to post the letter of invitation directly to the parent/carer rather than rely on the peers supporter to speak to them. Third, I could have asked a member of teaching staff to speak to the peer supporters to remind them to hand over the invitation letter and encourage their alters to take part. However, this would have added an additional burden to schools who already have many demands on their time, which as noted in section 3.5.3.3 of my systematic review was a

particular barrier to successful delivery of school-based smoking prevention interventions. The final approach would have required me to obtain ethical approval to ask the peer supporter for their own contact details so I could follow-up with them to see if they had been able to pass over the letter of invitation. I was not comfortable with this approach as it may have made the peer supporter feel pressurised to recruit their alters and would most likely have exacerbated the power imbalance discussed previously.

Attention now turns to considering the strengths and weakness of the research method used – qualitative interviews with egocentric sociograms - which I will discuss from five perspectives: visualising social networks; challenges of using the method; peer supporter engagement with their sociograms; analytical approach; and data reliability. But first, a brief reminder of the research method used is required.

### **9.3.2 Revisiting the research method**

The novel research method developed and tested in this thesis was the incorporation of egocentric sociograms into an in-depth qualitative interview, with additional detail captured using post-it notes and coloured dots. This enabled peer supporters to map both the potential and actual extent of message diffusion within their social networks. The social network mapping process (i.e. creating the sociograms) was deliberately designed to be quick and easy using a paper template with three concentric circles to which the peer supporters ranked their alters by adding a post-it note (one for each alter) to the relevant circle. Each post-it note included important alter demographic detail (e.g. age, gender, smoking status) as well information rated to their relationship to the peer supporter (e.g. type of family member, inside or outside of school friend, frequency and mode of contact). Finally, sociograms included the addition of coloured sticky dots to capture whom peer supporters had spoken to, perceptions of influence and potential alters for a follow-up.

As noted in Chapter Five the use of social network mapping techniques such as egocentric sociograms is not new. However, the addition of post-it notes and coloured sticky dots to add further context and serve as a prompt for further discussion is novel and, to the best of my knowledge, has not been tested with young people. Chapter Four also noted that a more common approach is for the sociograms to be created first and then revised during a subsequent interview. Further as noted in Chapter Three, there is a lack of tobacco studies collecting social network data from children and young people using qualitative approaches. This is in contrast to the numerous tobacco social network studies using quantitative

approaches, suggesting that the field has some way to go to address the imbalance between quantitative and qualitative approaches to SNA with children and young people (Mercken et al., 2012, Ennett et al., 1994, Ennett et al., 2008, de Vries et al., 2006, Hall and Valente, 2007).

The research method used in this thesis was, therefore, distinctive in three ways. First, peer supporter sociograms were created and then used as a prompt to facilitate discussion in one interview only. Second, post-it notes and coloured sticky dots were added to the sociograms to identify key information. Last, and most importantly, the approach was tested with young people, which makes a much needed contribution to the field as guidance from the peer review literature is currently lacking. This is why an entire chapter (Chapter Six) was dedicated to critically reflecting on applying the research method to an empirical research study.

### **9.3.3 Visualising social networks**

A potential strength of the research method was the visual and practical aspect to data collection. Bearing in mind the time restrictions (discussed 5.3.2) it was essential that the sociogram making process was not overly complicated or time consuming. The pen and paper approach meant that peer supporters could quickly process what I was asking them to do. It also enabled them to take ownership of their sociogram by having the option to write the alter detail onto the post-it notes, place them on their sociogram and add the coloured dots. The addition of coloured sticky dots to identify whom they had spoken to and perceptions of influence was also a great enabler to me as the interviewer because I could quickly see what areas to probe further in the qualitative narrative that followed after sociograms were created.

Peer supporter views on mapping their social network using sociograms, reported in Chapter Six were generally positive. Their feedback suggested that the approach made the interview experience less daunting than a traditional in-depth face to face interview. This may have helped to reduce power imbalance and potential anxiety the peer supporter may have had about being interviewed by an adult (which was discussed in 5.3.2.1).

Peer supporters also commented that looking at their sociograms helped them to think and reflect about whom they had a smoking conversation with but also, more broadly, it gave them a better understanding of their social network, i.e. who they *'hang about with'*. However, while this broader understanding was viewed positively by most peer supporters, for one it led them to question the size of their network as they perceived that it was too small. Despite this peer supporter's social network being rather large in comparison to others they felt it was lacking

in some way. Thus, when mapping social networks with young people, it is important to recognise that perceptions of how adequate the network is (in terms of size and composition) will vary from person to person. Researchers considering using this technique with participants of any age, but especially young people, should be mindful that visualising social networks could be a positive or negative experience and might cause distress or concern if the participant perceives that their network is too small or is missing important people (perhaps through family separation or bereavement). One way to mitigate this would be for the interviewer to reassure the participant that there is no right or wrong network in terms of size or composition and that just because it is big or small does not necessarily affect the quality of support we received from the people within.

### **9.3.4 Challenges of using the research method**

As noted previously one of the challenges I faced when designing the topic guide for the peer supporter in-depth interview was deciding on an appropriate name generation question to help peer supporters populate their sociogram. I knew from my review of the social network analysis (SNA) literature (discussed in 5.3.2.3) that care and thought was required to choose an appropriate question (referred to in the SNA literature as 'name generation question', herein shorted to NGQ), as this would influence the data collected and future analysis. I also knew, from my literature review, that the existing SNA evidence base lacked guidance on what was an appropriate NGQ for mapping the social networks of young people (discussed further in 5.3.2.3). Thus, my rationale for selecting my final NGQ was a combination of pragmatism (i.e. the need to create a NGQ that the peer supporters could easily understand and engage with quickly) and drawing on my past experience of conducting a similar exercise with a cohort of adult gamblers (Dobbie et al., 2017).

Based on my previous experience, I made the assumption that one NGQ would be sufficient to capture the level of detail required to answer the research questions for this thesis. However, once I started to conduct the peer supporter interviews, it quickly became apparent that one name generation was not sufficient. By simply asking peer supporters to list the names of people they felt close to, I was excluding other people who they may have had a smoking conversation with but did not feel particularly close to. Therefore, I introduced a series of secondary NGQs to help the peer supporter try to remember anyone who they had initiated a smoking conversation with, regardless of how close they felt to them.

The list of names in each sociogram can thus be viewed as a 'hybrid' list of alters comprised of: one list of people who peer supporters felt close to and could have potentially had a conversation with; and another list of people who peer supporters remembered initiating a conversation with. However, as peer supporters were asked to rank all of their nominated alters by level of closeness on their sociogram, the variation in how the list of names (alters) was compiled is less important. The key objective - i.e. to generate a comprehensive list of people who peer supporters could have potentially had, or did have, a conversation with - was achieved, but only by using a combination of primary and secondary NGQs.

The above discussion highlights a gap in existing SNR literature relating to the practical application of using NGQs to create egocentric sociograms through qualitative research methods. This is especially important in relation to using the approach with young people. Chapter Six attempts to address this gap by providing a set of nine recommendation based on my experience of using the approach which may help future studies using the same or similar approach (6.2.5).

More broadly the lack of literature to guide this approach points to the tension in social network research between 'formal' (i.e. quantitative) and qualitative data collection approaches (discussed in 4.3). Formal methods have been criticised for failing to capture the context in which social networks are situated as well as the depth and diversity of social networks. Such criticism draws parallels with the well-known paradigm wars between quantitative, 'positivist' and qualitative 'interpretivist' approaches more generally. However, in recent years there has been a 'cultural turn' in social network research, which now recognises that social networks are more than social structures to be measured, but also have meaning and content. This can add a greater depth of understanding and insight into social relationships and the potential to influence attitude and behaviours (Bellotti, 2015, Heath et al., 2009a). This has resulted in a rise of qualitative and mixed method social network studies incorporating the use of data visualisation tools such as sociograms to collect, analyse and interpret network data (Hogan et al., 2007, Ryan et al., 2014, Tubaro et al., 2016a).

Findings from the qualitative social network study conducted as part of this thesis have arguably contributed to the further development of research methods in this area in two ways. First, it has incorporated the use of sociograms into a qualitative interview. This facilitated the collection of alter characteristics, but also measured the potential and actual spread of message diffusion. Second, it has provided some needed guidance on using the approach with young people.

### 9.3.5 Peer supporter engagement with their sociograms

In general, peer supporters understood the name generation question (*please think about the people you feel close to?*) and engaged with it well, generating a list of names quickly and being able to rank them in levels of closeness with little hesitation. However, one of the key considerations was the cognitive and emotional load it placed on peer supporters, who in a very short period of time had to grasp the concept of making their own sociogram, think about the people they felt close to and rank them in order of closeness (Ryan et al., 2014, Dobbie et al., 2017).

This proved difficult for adults who completed a similar task for a qualitative, longitudinal study of gambling, as described by Dobbie et al., 2017, who talked about ‘problematic positioning’ of alters. The term captured the complex nature of ‘closeness’ which may vary between partners and parent and child. This can cause difficulty for adult participants when asked to rank their alters, creating a concern that they were being disloyal by ranking some higher than others. The authors used the example of one participant who when asked the NGQ (*please think about the important people in your life right now?*) nominated her children first, but then expressed feelings of guilt that she did not mention her husband first. The authors further comment, that throughout the interview it became obvious that this participant had found it increasingly difficult to nominate and rank her alters by level of closeness. This was despite the reassurance of confidentiality and being in a private space where no one could hear the conversation. They concluded that some people simply resisted the ranking task,

*As the exercise progressed it was clear that Shona found it increasingly difficult to separate or rank her alters and wanted to put everyone in her inner circle - family, friends, neighbours, in-laws, grandchildren, Gamblers Anonymous contacts and even her dead mother. Throughout, the interviewer tried to explain the placement strategy, but she resisted: her relationships did not work like this, and she rejected the spatial placing that we had constructed for the task. She found it very hard to leave anyone out and creating the ego map was difficult for her. (Dobbie et al., 2017, p. 217)*

However, as noted in Chapter Six, for the young people who participated in this study no such angst or discomfort was evident. The ranking process happened quickly, with minimal hesitation or changing of position, once peer supporters had added their alter post-it notes. This may suggest that the young people found the process easier than adults, but further research is required to substantiate this.

### **9.3.6 Analytical approach and data validity**

As noted in Chapters Four and Five my research study design was qualitative, using in-depth face to face interviews incorporating egocentric sociograms, but my analysis was mixed method. To build my argument in support of message diffusion beyond the peer supporter school year and into their broader social networks, I needed to conduct descriptive analysis of both the potential, and actual, extent of message diffusion beyond the school year. It was also crucial that I was then able to draw on the qualitative data that accompanied the sociogram creation to explore important issues related the context and content of message diffusion (discussed in Chapter Eight).

Despite the benefit of using this visual and novel research method, one of the key challenges raised in the SNR literature is that of data validity – i.e. how accurate is the data collected? For this thesis this was particularly important when considering the perceived influence that a smoking conversation had on the alter. As noted by Crossley et al., (2015) one of the challenges of asking participants to map their social networks is that all the detail on the nominated alters comes from the participant and not the alter themselves. This means we cannot be sure that perceptions (from the ego) of conversation influence are the same as the alter themselves. This is especially relevant in the context of an adult interviewing a child, with the child more inclined to try and please the adult by telling them what they think they want them to hear. This is why eliciting opinion from alters would have made an important contribution because views from the ego and alter could have been compared and contrasted.

### **9.3.7 Summary of contribution to research methods**

To conclude this part of the discussion focusing on the research method developed and tested in this thesis, it has made a methodological contribution in three ways. First, it offers a new approach to conducting qualitative research with children and young people that could potentially be applied to any subject area not just adolescent smoking prevention. Second, it has contributed to qualitative research methods by furthering understanding of incorporating sociograms into a face to face in-depth interview and using them as a tool to prompt for greater depth and understanding. Finally, it has made a contribution to network science by furthering understandings of collecting social network data with children and young people, especially around name generation questions (both by testing NGQs and furthering understanding of how they are interpreted by the participant).

My experience of using this research method also raised two key ethical issues. The first, centred around perceptions of social networks being too small. For example, one participant, who when reflecting on their sociogram, was disappointed that it was lacking in alters. Seeing social networks mapped visually has the potential to cause upset in three ways: 1) if the participant would like a larger network than the one they actually have; 2) if they would like to feel closer to people who are already in it; or 3) there are missing people who are no longer part of their network (i.e. due to bereavement, family breakdown, fall outs with friends etc). Second, family composition has changed considerably in recent decades, with young people living in lots of different types of families (e.g. single parent families, blended families, same sex families, foster and kinship families etc). This emphasises the need for interviewers to take great care when deciding whether it is appropriate or not to probe for people who they perceive to be missing from a sociogram. There may be deeply sad or complex reasons why a mother or father, for example, is not included.

#### **9.4 Strengths and limitations**

This thesis has a number of strengths and limitations. First, the research questions and research design were derived from two literature reviews and one systematic review of the literature. In addition to this, the use of qualitative social network research methods to map peer supporter social networks helped to add greater depth of understanding to the extent of message diffusion from ASSIST. Further, the thesis supported the development and pilot testing of a novel and visual approach to collect network data and facilitate greater interpretation. This offers another approach to conducting qualitative studies with young people but, more broadly, informs the development of health behavior change intervention design which I have applied to my own research portfolio (discussed further in section 9.5.1) The sample of peer supporters was diverse with a mix of gender and ethnicity and analysis was grounded in a thematic analysis using inductive approaches. Finally, it has generated a series of implications for the future delivery of ASSIST which could facilitate the extension of message diffusion and influence smoking attitudes and behaviours.

However, despite these strengths there are several limitations to this work. First, the literature on the factors that influence adolescent smoking trajectories is dated. Further, the systematic review identified just five studies that met the inclusion criteria, which also emphasizes the lack of recent evidence on adolescent smoking prevention, school based, interventions. This is most likely a reflection of the fall in adolescent smoking prevalence discussed in Chapter Two. The systematic review was conducted at the start of my PhD which meant the search

period is limited to December 2014. Lack of time meant the search was not updated in 2021. Findings from the empirical research presented descriptive statistics from a sample of peer supporters, which are not generalisable to the broader peer supporter population. This means that findings reported in Chapters Seven and Eight should be viewed as preliminary and may not reflect the broader peer supporter experience. However, the finding that there is potential for broader message diffusion was also found in a recent study by White et al., (2019) so there is consistency of findings.

A key limitation which was evident from the start of the fieldwork piloting, was the limited time I had to conduct interviews with young people. Due to the interviews being conducted in school time, it was not possible to extend the interview beyond 50-minute class period. This means that some areas of interest were not explored more fully – e.g. peer supporter attitudes towards smoking and the ways in which this could have influenced their role as a peer supporter. However, any extension beyond this could have ran the risk of the young people losing interest and becoming disengaged. Nevertheless, there was a lot to get through in a short space of time and this inevitably meant there were some occasions where I missed opportunities to probe more deeply.

The failure to recruit any alters for interview was very disappointing. Without the alter perspective, the thesis is lacking an important dimension to the discussion including alters views on message recall, content and influence, as well being able to compare peer supporter accounts with that of their alters. However, lessons were learned from the pilot recruitment approach with amendments suggested for any future attempts using a similar approach. With hindsight, had I known the alter interviews would be have been unsuccessful I may have considered conducting follow-up interviews with peer supporters to explore some of the points raised in their first interview in more depth (e.g. greater understanding of their perceptions of being a peer supporter and what they thought of their role and contribution to ASSIST). It would also have enabled me to explore whether my interaction with the peer supporters and creating their sociogram prompted any further conversations.

## 9.5 Reflections on the research process

In this penultimate section of the discussion chapter, I offer some reflections on my role as a part-time PhD student, completing the thesis while working on other research projects in my academic role. A starting point for these reflections is to consider **my experience as a researcher prior to commencing the PhD**. I had worked in in the field of health promotion

and public health for over a decade before registering as a PhD student. I had some pre-existing knowledge in the subject area, but I also had skills in research project management, research design, as well as conducting qualitative research and analysis. This experience undoubtedly helped in my PhD journey as I did not need to spend time developing these important skills. In addition to this, I was also involved (as the lead researcher) in the evaluation of the pilot delivery of ASSIST in Scotland. This was invaluable for two reasons. First, I had a solid and in-depth understanding of the ASSIST model and the user manual that accompanied the Scottish protocol. This meant I came into the PhD already knowing some of the strengths and weaknesses of the ASSIST programme, which grew and became more nuanced throughout the PhD. Second, having conducted the pilot process evaluation I had already built up a strong professional relationship with two schools, who would then go on to be the host schools for my fieldwork. Without this pre-existing rapport it would have taken much longer to secure participation from schools.

**Next is balancing my PhD alongside my full-time research role.** Having not had the traditional research pathway of an academic (I came back into academia in 2011 after several years as a researcher, and research commissioner in the public, private and voluntary sector), I embarked on a PhD to develop my skill set and strengthen my position as an academic researcher. Completing the PhD took six and half years, far longer than I expected. This was, in part, through my own conscious and deliberate decision to prioritize my career progression - when I started I was Research Fellow, in 2018 I became a Senior Research Fellow. For example, there were times when I would reduce productivity on my PhD to focus on advancing my academic career by writing papers for peer review publication or leading on writing funding applications. There were also times when the research projects I was working on were busy and required all of my time. Had I not done this I would have completed the PhD earlier but my career advancement would have stalled. However, there were also significant life events (some wonderful, some devastating) that necessitated short breaks to my PhD. Despite my PhD undoubtedly causing brief periods of stress and anxiety, the constant juggling of competing priorities in my professional and private life with the PhD, undoubtedly helped to develop my time management and organizational skills, which has helped in my academic career.

A positive reflection of conducting the PhD part-time is the growth in my reading, analytical and academic writing skills, which developed over this period. As a dyslexic student I am particularly proud of this achievement. I also developed my research skills by conducting my first systematic review, developing a new data collection tool and learning more about the

influence of social networks and the contribution social network research can make to my work.

It is this broader contribution to my own academic career which is the final reflection of my PhD journey - **the effect it has had on my own research**. The skills and knowledge I have gained from conducting the PhD have already been transferred to other studies I have or am conducting. For example, I have submitted two funding proposals using an adaptation of the sociogram discussed in section 9.6.1 to create network health behavior change interventions. One was a development study to adapt the current ASSIST model to protect adolescents from gambling related harm. The lessons learned from the PhD have been transferred and the broader diffusion to peer supporter whole networks will be pilot tested in one school. Further, I will be using an adapted version of the sociograms as part of the two-day training to help peer supporters think more about who peer supporters could speak to and plan how they could approach this. I intend to use their sociograms to track the extent of message diffusion at each of the future follow-up sessions. The second project was again an adaptation of the ASSIST model to promote bystander CPR (cardiopulmonary resuscitation) in deprived communities using social network intervention theory.

These reflections, helped me to consider how my own experience and personal beliefs may have influenced findings from this thesis. In these final paragraphs I will consider 'researcher reflexivity', discussed previously in 5.2.1, from three perspectives.

First, is my motivation to conduct the thesis. As noted in paragraph 1.8 my initial motivation was to strengthen my position in academia by consolidating my existing skill set and research experience. However, I also wanted to develop my academic writing and research method skills (i.e. conducting a systematic review and social network research). As the years passed and my PhD found its place alongside my Research Fellow role, I realise that it has influenced the trajectory of my academic research, For example, I have actively sought projects and funding opportunities that involve social networks. Further, due to my grounding as a mixed method researcher I approached the thesis with an interpretivist philosophical perspective. This, undoubtedly shaped the research questions and research design for the thesis.

Second, is my prior involvement with ASSIST Scotland, which overall, I viewed as a positive contribution to the thesis. However, the in-depth knowledge I had of the programme and its delivery may have meant that I interpreted meaning from the interviews in a different way to someone with no previous awareness of the programme. Related to this was the

relationships I formed with founding members of ASSIST, as well as the research and ASSIST delivery team. All of this will have influenced how I approached data collection and analysis, despite my attempts to maintain researcher impartiality.

Finally, my experience as a mixed methods researcher will have influenced the decisions I made about the research design and analysis. For example, from previous experience of conducting research with young people I am more comfortable with face-to-face interviews rather than paired or small group discussions (having had less productive experiences of conducting mini groups with young people). Had I not had this prior experience I may have decided that paired interviews or mini groups would have been a viable approach, which could have facilitated a larger sample. This is why I took care and time to consider the different approaches to data collection with young people discussed in 5.3.2.1.

## 9.6 Implications and recommendations

Having considered the key findings, attention now turns to the implications, recommendations and future research from these findings. This will be considered from the perspective of ASSIST and health behaviour change intervention design more broadly.

### 9.6.1 ASSIST

Findings from this thesis point to two key implications and recommendations for the future delivery of ASSIST. The first, is to consider adapting the programme to **extend message diffusion beyond the school year** by encouraging peer supporters to speak to anyone in their social network, who they feel comfortable to approach. Evidence from this thesis suggests that this addition would capitalise on the currently untapped potential to create broader influence beyond the school setting. Support for this extension also comes from Mermelstein (2008) who, in his Lancet comment piece reviewing findings from the ASSIST RCT, noted the following,

*As encouraging as ASSIST's findings are, an important message is the need to go beyond the classroom setting and into the many domains of social influence that adolescents encounter.* (Mermelstein, 2008, p. 1557)

Although this was noted over a decade ago, I was unable to find any examples of peer reviewed intervention, specific, studies that were school based and had purposefully

attempted to use peer education and network intervention approaches to diffuse health promotion messages into adolescent social networks, beyond the school environment. Thus, a limitation of the existing evidence base is a lack of understanding of the potential barriers and facilitators to extending message diffusion to include the peer educator's social network both within and outwith school. As noted in Chapter Three, this could be a reflection of potentially relevant studies not being labelled as 'network interventions', or it may be that broader diffusion among social networks was not the intended outcome and therefore not reported. Regardless of why they are not there, it means there is no comparable evidence to offer insight into how successful or unsuccessful extending the reach to peer supporter broader social networks could be. It also creates a further challenge in regards to how the extent of diffusion into broader social networks should be recorded and monitored.

However, a recent paper by White et al., (2019) offers some support for the broader extension of ASSIST message diffusion. Their quantitative analysis sought to investigate whether ASSIST message diffusion extended to the people peer supporters lived with. They found a reduction in smoking prevalence among peer supporter family members and suggested that this could be due peer supporters carrying their diffusion role into their family home. The authors concluded that future studies of ASSIST, or health behaviour change interventions using a similar approach, should include other family members who may indirectly benefit from the intervention,

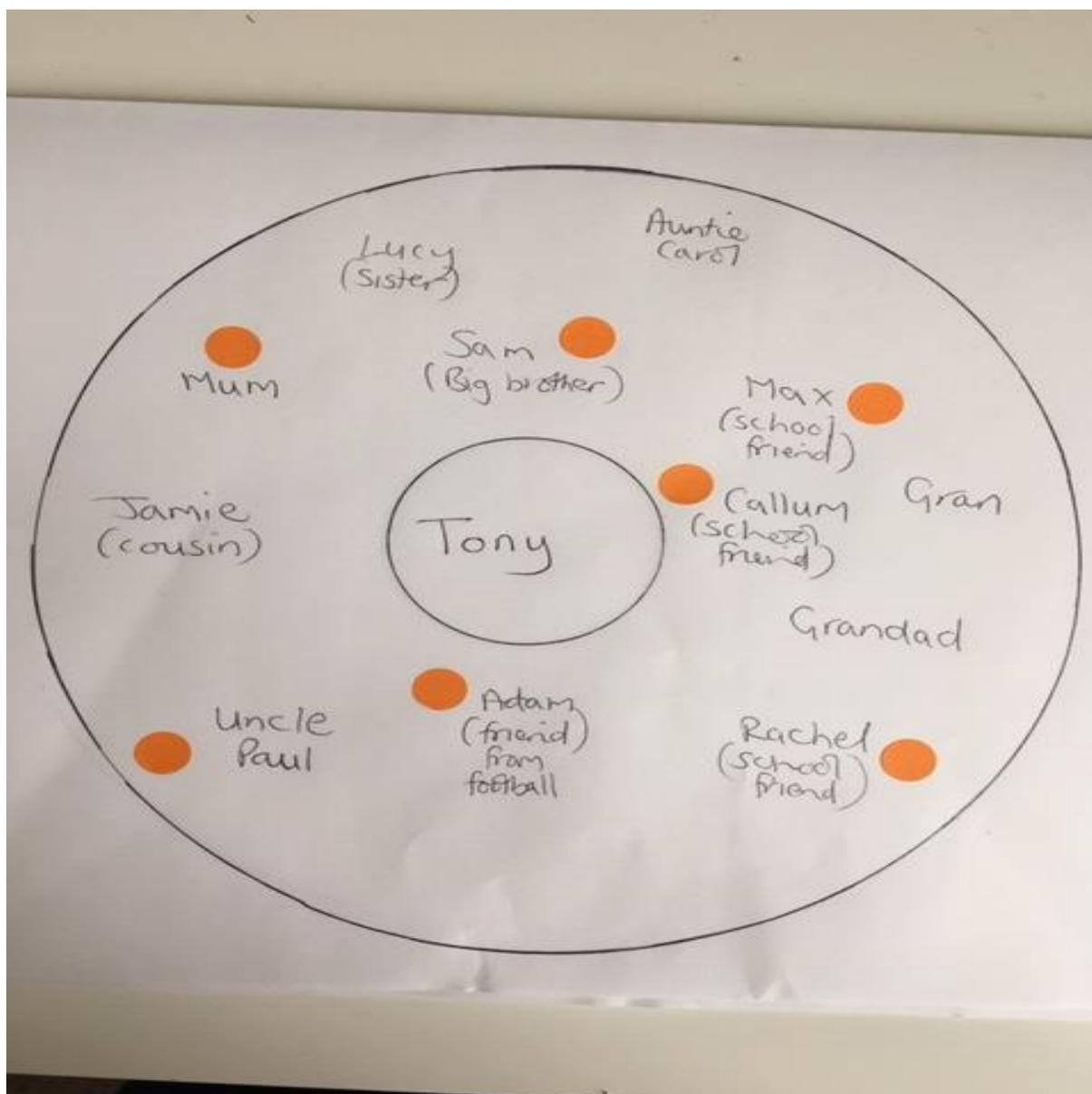
*If these findings are replicated, it would suggest that outcomes targeted by an intervention should be collected on those who might be indirectly exposed (e.g. spouses, family members, siblings, friends, co-workers) to gain a more comprehensive account of potential benefits.* (White et al., 2019, p. 5)

Any future extension to the programme to include peer supporter social networks would need to carefully consider five key points. First, is the additional burden it could place on peer supporters who will be encouraged to speak to more people, especially in relation to the existing demands on their time with hobbies, social life and schoolwork. Second, findings from this thesis, and previous research, have highlighted the potential for peer supporters to feel anxiety around their role and disappointment if conversations were not as successful as they had hoped (Audrey et al., 2006). Care is, therefore, required to ensure young people do not feel overwhelmed with their peer supporter role. Third, is the potential associated ethical concerns that may arise from the difference in power dynamic of a child speaking to an adult. Related to this is the fourth consideration which is that of influence beyond the school year. Peer supporters are selected by peers in their school year based on their potential to have

influence within their year group, this may not translate to their wider social networks. Careful thought is, therefore, required to support the peer supporter to engage in wider diffusion within their social network and stress the importance that it is the peer supporter's decision who they decide to approach or not. Finally, peer supporters would need to be given help and support to better understand their social network, think about who they could approach and plan how to do this.

This leads to the **second potential implication** of this research for the delivery of ASSIST, which is to **include social network mapping as part of the two-day training and follow-up sessions**. Not only would this help peer supporters to engage in more focused thinking around 'who' they could speak to it could also be used as a tool to track the extent of message diffusion at each of the four follow-up sessions, which is currently lacking in the ASSIST evidence base. One approach which could be easily incorporated into the two-day peer supporter training programme could be to adapt the sociogram making process developed and piloted in the thesis. For example, peer supporters could map their social networks in day two of the training programme (which focuses on the skills students will need to deliver their role). The figure below is a mock-up of what the sociograms could look like and illustrates that the sociograms would be a simpler version of what was used for the fieldwork in this thesis. In addition to being simplified, the need to rank alters could be removed to ensure peer supporters did not feel any awkwardness or discomfort when mapping their networks, which could potentially be looked at by other peers. In addition to the ranking of alters being removed so to could adding alter characteristics on a post-it note, which could be time consuming. Peer supporters could simply be asked to write down the name of their alters which would be in response to a generic name generation question such as – '*who do you speak to regularly?*'.

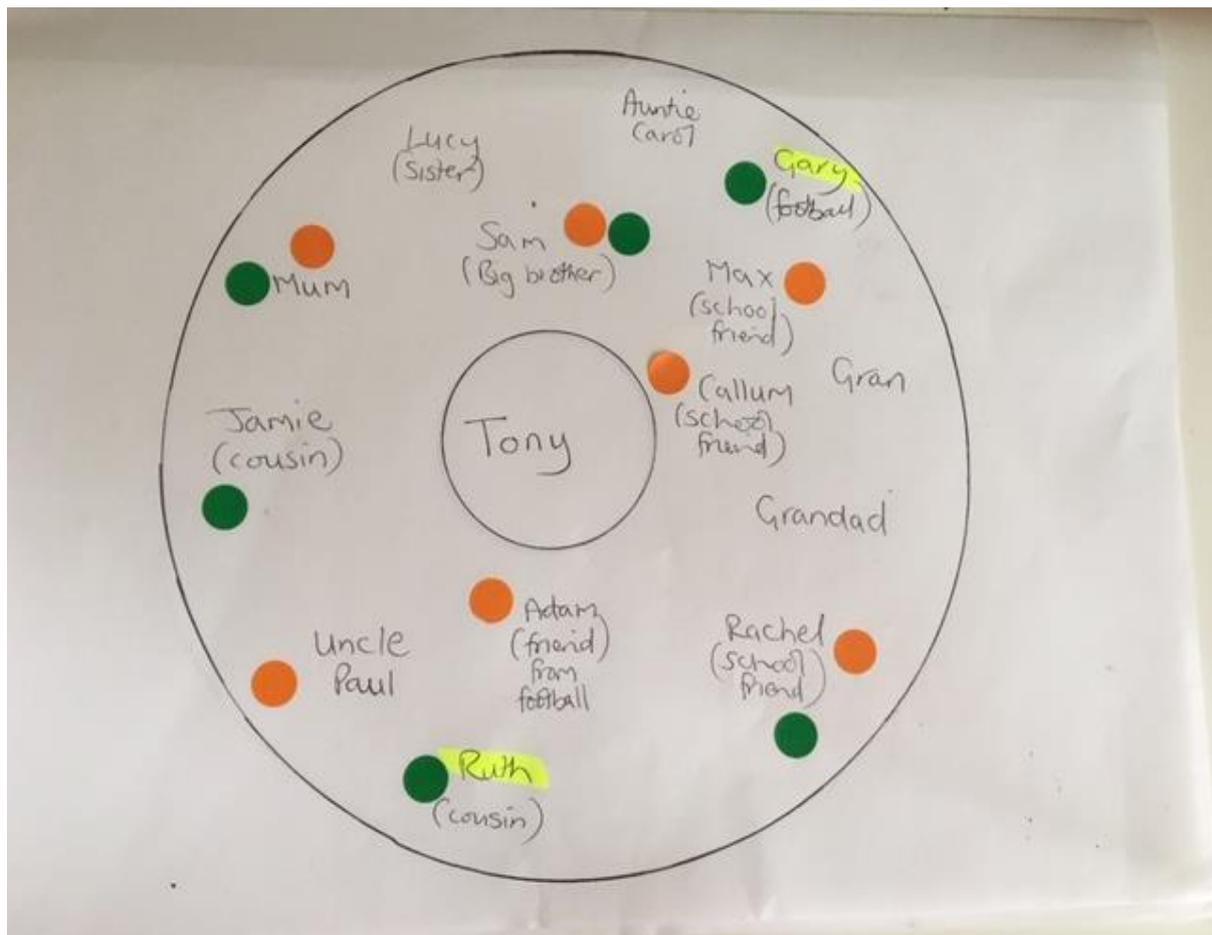
**Figure 9.1: Sample sociogram for future peer supporter training**



Once peer supporters have added names to their map, they could then review their maps to think about who they think they could/would like to initiate a conversation with. These people would be identified with a coloured dot (in the example above this is an orange dot). The addition of the coloured dot is an important piece of monitoring data as it shows who peer supporters initially thought they could initiate a conversation with.

The maps could then be revisited at each follow-up session with peer supporter asked to add another dot (see Figure 9.2 below, different in colour – green in this sample sociogram) to identify who on their maps they actually engaged a conversation with. The maps would have the flexibility for additional names to be added at each follow-up stage as illustrated in Figure 9.2 with additional names highlighted in yellow.

**Figure 9.2: Sample sociogram updated at follow-up sessions**



This process would mean that greater attention could be paid to a more systematic approach to measure the extent of message diffusion which as noted previously is currently lacking in the existing ASSIST evidence base. Thus, creating these 'ego' sociograms would serve as a crucial piece of monitoring data because it would visually show the potential for extended message diffusion which could then be compared with the actual extent at the end of the fourth follow-up session. In addition to this, peer supporters would be reconnected with their sociograms at each of the four follow-up session and would, therefore, have a visual reminder of who they have and have not spoken to. This could help to encourage peer supporters to continue with message diffusion beyond the first few weeks of training, which previous research has shown tends to be the case (Starkey et al., 2009b), (Dobbie et al., 2017). This approach could also replace the current paper diary approach, which previous evaluations have indicated is underutilised and outdated (Dobbie et al., 2017).

### 9.6.1.1 Isolates

It is encouraging that findings from this exploratory study support extending the reach of message diffusion beyond the school year and into peer supporter broader social networks. However, Chapter Two's, review of the social network research literature looking at adolescent smoking behaviour, highlighted the importance of 'isolates' living in deprived communities (i.e. young people with limited social contact and/or few or no friends). Isolates were part of a typology of adolescent smoking behaviour created by analysis of network structure and were identified as the group with the highest smoking prevalence and, therefore, most at risk (Choi and Smith, 2013).

This raises important questions for ASSIST. Based on diffusion theory (see section 1.5) ASSIST requires peer supporters who have networks that they can influence. This means that ASSIST targets clique members or liaisons to become peer supporters, not isolates. Previous evaluations of ASSIST have found that the peer nomination approach discussed in 1.4 is successful at targeting students who are more socially connected (i.e. cliques or a liaisons). For example, Holliday et al., (2016) conducted a formal social network analysis of data from a student baseline and follow-up survey to assess whether the peer nomination process was successful in identifying peer supporters who were more socially connected than other students in their school year. Their analysis concluded that the peer nomination approach:

*...was successful in achieving the goal of identifying peer supporters who were more socially connected than other students in their year, providing confidence that these students had the potential to effectively disseminate the smoke-free message across the year group.* (Holliday et al., p. 951)

This suggests that isolates are excluded from becoming peer supporters. As noted in 1.5. there is good reason for this - the success of the ASSIST intervention hinges on identifying peer supporters with enough influence to diffuse smoke-free messages throughout their school year. However, this runs the risk of a vulnerable group (i.e. those with little or no social connections) being excluded from the intervention and raised as an area requiring further research in 9.4.3.

### **9.6.2 Health behaviour change intervention design**

A consistent narrative from my research findings is that ASSIST message diffusion can spread further than just the school year, reaching family members and friends outside of school. This creates an opportunity for the expansion of ASSIST and other network interventions that use similar approaches (e.g. drugs, sex education and gambling) to peer supporters' whole network, not just their school year. More broadly it offers insight to health behaviour change scientists who seek to design interventions to promote health promotion. It does this by raising awareness of the potential benefit of using network intervention theory as a tool assist intervention design. The link between social relationships and health, and the of potential of social networks for health behaviour change, has been recognised in recent years. For example, in 2014 the then, Chief Medical Officer for England, Dame Sally Davies, acknowledged in an article for the Lancet that:

*Evidence of the role of social networks in individuals' adoption of behaviours suggests that social networks could be used as messengers, to help to set norms and create local feedback conducive to health behaviours.* (Davies et al., 2014, p. 1891)

However, a key finding from the systematic review (Chapter Three), was that despite social networks featuring in the included studies for both the 2009 and 2014 update, their contribution was not explicitly discussed, and authors did not use social network terminology or label their intervention as a 'social network intervention'. This is most likely a reflection of the criticism made in Chapter Four of the considerable gap in the existing evidence base looking at how social networks can be utilized to support health behaviour change. Findings from this thesis make a contribution to this evidence gap by highlighting ASSIST as an example of a social network intervention and also describing how it could be adapted to include peer supporters' broader social network, rather just their school year peers.

### **9.6.3 Future research**

This thesis has generated several potential areas for future research. Some of these are specific to ASSIST but others relate to both approaches to adolescent smoking prevention in general and research methodology. Starting first with ASSIST, there are three key areas that require further investigation. First, is to the fully understand the potential cognitive and emotional burden that being a peer supporter could place on students, especially if the intervention was extended to include their wider social network outside of school. Second, is

to further test and evaluate the use of sociograms to help peer supporters think and conceptualize who they could potentially speak, and to monitor the extent of message diffusion via follow-up sessions where sociograms are revised and adapted. Third, further research is required to determine the best approach to monitor the actual extent of message diffusion by peer supporters, this could be using the approach mentioned above or development of a completely new method. Regardless, the ASSIST evidence base lacks robust assessment of the actual extent of message diffusion beyond the school year. Clarity about this is crucial if the current model is to be extended to include peer supporter broader social networks.

Next, regarding adolescent smoking prevention programmes in general, it may be important to pay more attention to isolates (as discussed in 9.6.1.1). Further research is required to either tailor smoking prevention interventions specifically for isolates or adapt existing interventions like ASSIST to ensure they include isolates. Key areas to consider are: what a future intervention focusing on isolates would look like? What network intervention theories (discussed in 4.4.2) could be used to support isolates to form links to cliques and liaisons? How can the young people identified as 'isolates' and, therefore a vulnerable group, not feel stigmatised? Answers to these questions are currently lacking as noted by, Choi and Smith (2013) whose systematic review concluded that there were very few network interventions that had attempted to find isolates and help them connect with larger networks and with mixed results from those who have (Choi and Smith, 2013).

Aspects of the research method also merit further research. For example, there is currently a lack of literature on ways to guide the inclusion of sociograms as part of qualitative interviews with young people, and specifically on appropriate name generation questions. Further, there is a need to develop better approaches to the recruitment of alters for interview. As noted previously, their contribution would have provided further valuable data on message diffusion, but the data protection regulations to which the recruitment plan adhered was to the detriment of alter recruitment. Alternative approaches to securing contributions from this important group is required.

## **9.7 Conclusions**

Findings from this exploratory study support extending the reach of ASSIST beyond the peer supporters' school year and into their broader social networks. Diffusion spreads far beyond alters in the peer supporter school year, reaching family members and friends outside of school. This creates opportunity for the expansion of ASSIST and other network interventions

using similar approaches, in which the whole network could be targeted for message diffusion. The thesis has also considered the ways in which this extension could be applied in practice and highlighted the ethical considerations (such as the power dynamic of a child speaking to an adult and how messages are put across especially the use of 'fear' or shock tactics') that would require care and attention.

It has also made a contribution to qualitative research methods and social network research by developing and pilot testing a novel and visual approach to collecting and interpreting social network data from young people using sociograms, post-it notes and coloured dots. Further, it has illustrated how this approach could be simplified and incorporated into the future delivery of ASSIST (and other health behaviour change interventions using a similar model) to capture more robust evidence of the extent of message diffusion, which is currently lacking.

# Appendices

## Appendix 1: Summary of search strategy for literature reviews

Literature was sourced using several methods, summarised below:

- Searching electronic databases: Ovid MEDLINE(R) EMBASE, PsycINFO, HMIC (Health Management Information Consortium) Applied Social Sciences Index and Abstracts (ASSIA). A range of search terms we used which included: child; minor; young people; young person; young adult; adolescent; youth; Juvenile; teenage; student; pupil; girl; boy; gender; female; male; smoke; smoking; tobacco; cigarette; nicotine; start; initiate; commence; prevalence.
- Websites searches for datasets and Government reports.
- PhD thesis's, published and unpublished articles/reports identified by experts in the field.
- Mining of reference lists from key publications.

## **Appendix 2: Summary of SALSUS and HBSC**

Table A1: Summary of HBSC and SALSUS

	<b>HBSC</b>	<b>SALSUS</b>
<b>Background and purpose</b>	<p>The HBSC provides health and well-being data of young people in countries across Europe and North America. In the UK, data are collected every four years in Scotland, England and Wales which allows for comparison across the UK (data are not collected for Northern Ireland).</p> <p>In Scotland the first HBSC survey was conducted in 1990 and thereafter every four years: 1994, 1998, 2002, 2006, 2010, 2014 and 2018.</p> <p>HBSC aims to increase understanding and create new insight into young people's health and wellbeing and health behaviours in their social context (i.e., home, school, family and friends). HBSC findings are used to inform and monitor health policy and education programmes to improve young people's lives. These data also serves as a secondary dataset for researches to use.</p>	<p>Scotland introduced SALSUS (Scottish Schools Adolescent Lifestyle and Substance Use Survey) in 2002. Prior to this Scotland and England ran a joint survey but it could not provide information at a Local Authority or Health Board level. Since then SALSUS has run every two years with a break in 2012 and subsequent surveys delivered in 2013, 2015 and 2018.</p> <p>The main purpose of SALSUS is to evaluate existing policy, and monitor progress against key Scottish Government targets (set out in documents such as the 'Tobacco Control Strategy – Creating a Tobacco-Free Generation') for reducing smoking, drinking and drug use amongst Scottish adolescents. It also serves to inform policy and practice by providing patterns and trend data.</p>
<b>Content</b>	<p>Core questions collect data on six key areas:</p> <ul style="list-style-type: none"> <li>Demographic factors (age, sex)</li> <li>Social background (family structure, socio-economic status);</li> <li>Social context (family, peer culture, school environment)</li> <li>Health outcomes (life satisfaction self-rated health, injuries, Body Mass Index)</li> <li>Health behaviours (physical activity, eating and dieting)</li> <li>Risk behaviour (smoking, cannabis use, sexual behaviour, alcohol use, violence and bullying)</li> </ul>	<p>The survey collects information on:</p> <ul style="list-style-type: none"> <li>Prevalence and trends of smoking, alcohol and drug use, frequency of use and age of initiation</li> <li>Source and availability of substance use</li> <li>Knowledge and attitudes towards substance use</li> <li>Smoking behaviour of friends and family and exposure to second hand smoke</li> <li>Family structure, parental knowledge and monitoring of children's activities, deprivation and subjective wealth</li> <li>Friends and leisure activities</li> <li>School</li> <li>Health and mental health</li> </ul>

<b>Funder and lead contractor</b>	Collaborative study with the World Health Organisation (WHO), each country taking part Has to secure their own funding. The Scottish survey is funded by NHS Health Scotland and since 1995 has been administered by the Child & Adolescent Health Research Unit (CAHRU) at the University of St Andrews.	Funded by The Scottish Government. Currently Ipsos MORI are the lead contractors who also delivered the 2008, and 2010 surveys. The 2002 and 2004 surveys were conducted by CAHRU, and TNS-BMRB delivered the 2006 survey.
<b>Sample</b>	Target sample are school children in the last year of primary school (P7), second (S2) and fourth (S4) years of secondary education (average ages are 11.5, 13.5 and 15.5 respectively). All local authority and independent sector schools are eligible for inclusion. Schools for children with special educational needs are excluded.	The target population is all secondary school students in second (S2) and fourth year (S4) in Scotland. Pupils are mainly 13 or 15 years of age at the time of the survey. All local authority and independently-funded schools are eligible, schools for children with special educational needs are excluded.
<b>Method of data collection:</b>	Self-complete questionnaires administered in the classroom, by teaching staff (it is not clear whether schools administer under exam conditions or not).	Self-complete questionnaires administered in class by teaching staff who were instructed to administer under exam conditions (it is not clear how many schools were able to accommodate this request)

Table populated from: Currie et al., (2011), Roberts et al., 2009), Scottish Government (2013)

### Appendix 3: Systematic review search strategy

MEDLINE example full search strategy. This search strategy was adapted for each database.

1. young people.mp.	18. secure unit\$.mp.	31. (program\$ or lectur\$ or
2. young person\$.mp.	19. training unit\$.mp.	train\$ or workshop\$ or
3. young adult\$.mp.	20. secure training.mp.	seminar\$ or lesson\$ or learn\$
4. adolescent\$.mp.	21. referral unit\$.mp.	or curricul\$ or course\$ or
5. youth\$.mp.	22. school\$.mp.	educat\$.mp.
6. teenage\$.mp.	23. (offender\$ adj	32. or/28-31
7. girl\$.mp.	institute\$.mp.	33. 26 and 32
8. boy\$.mp.	24. further education.mp.	34. exp Smoking/ or
9. exp Adolescent/	25. or/13-25	smoking.mp.
10. Child/	26. 25 and 12	35. smok\$.mp.
11. child\$.mp.	27. health promotion.mp. or	36. tobacco\$.mp.
12. or/1-11	exp Health Promotion/	37. cigarette\$.mp.
13. exp Schools/	28. health education.mp. or	38. nicotine\$.mp.
14. academy.mp.	exp Health Education/	39. ((prevent\$ or abstain\$ or
15. academies.mp.	29. primary prevention.mp. or	abstin\$ or stop\$ or discourag\$
16. city technology.mp.	exp Primary Prevention/	or anti\$ or no or non) adj2
17. education	30. (campaign or teach\$ or	smok\$.mp.
centre\$.mp.	advis\$ or counsel\$ or promot\$	40. or/35-39
	or encourag\$.mp.	41. 34 and 40
		42. limit 41 to (english
		language and yr="2008 -
		2017")

## Appendix 4: Websites of key organisations to identify grey literature

Action on Smoking and Health (ASH) <http://www.ash.org.uk/>

ARIF website and database <http://www.arif.bham.ac.uk/>

ASH <http://www.ash.org.uk/>

ASH Scotland website <http://www.ashscotland.org.uk/ash/>

Bandolier <http://www.bandolier.org.uk/>

Centre for UK Tobacco and Alcohol Studies <http://www.ukctas.ac.uk>

Clinical Evidence <http://clinicalevidence.bmj.com/ceweb/conditions/index.jsp>

Cochrane Public Health Group <http://www.ph.cochrane.org/en/index.html>

Department for Children Schools and Families <http://www.dcsf.gov.uk/index.htm>

Health Scotland <http://www.healthscotland.com/>

[http://www.nice.org.uk/aboutnice/whoweare/aboutthehda/hdapublications/hda\\_publications.jsp](http://www.nice.org.uk/aboutnice/whoweare/aboutthehda/hdapublications/hda_publications.jsp)

<http://www.childrensnscasestudies.dh.gov.uk/children/nsfcasestudies.nsf>

NICE public health guidance

<http://www.nice.org.uk/guidance/index.jsp?action=byType&type=5>

Public Health Observatories' websites Quit <http://www.quit.org.uk>

The Campbell Collaboration <http://www.campbellcollaboration.org/>

The Evidence for Policy and Practice Information and Co-ordinating Centre (EPPICentre)

Social Science Research Unit Institute of Education, University of London)

<http://eppi.ioe.ac.uk/cms/>

The Trials Register of Promoting Health Interventions (TRoPHI) <http://eppi.ioe.ac.uk/cms/>

TRIP database <http://www.tripdatabase.com/index.html>

UK Public Health Association <http://www.ukpha.org.uk/>

## Appendix 5: Sifting checklist

Article title:

Q1	Is the full paper written in English and published from 2008 – 2014?	Yes /unclear	Go Q2
		No	Exclude
Q2	Does the paper address prevention of uptake of smoking in children in primary or secondary school?	Yes /unclear	Go Q3
		No	Exclude
Q3	Is the age range of the study participants between 11-15?	Yes	Go Q4
Q4	Was the study carried out in an OECD country (see list below)?	Yes /unclear	Go Q5
		No	Exclude
Q5	Does the paper report on a school-based intervention or have a school-based component within a combined intervention?	Yes /unclear	Go Q6
		No	Exclude
Q6	Is the paper a qualitative study or have a qualitative component within a quantitative study?	Yes /unclear	Go Q7
		No	Exclude
Q7	Does the study report primary research (systematic reviews will be identified to source primary research studies only)?	Yes /unclear	Include for full review
		No	Exclude

Member countries of the Organisation for Economic Co-operation and Development (OECD):

Australia  
Belgium  
Chile  
Denmark

Austria  
Canada  
Czech Republic  
Estonia

Finland	France
Germany	Greece
Hungary	Iceland
Ireland	Israel
Italy	Japan
Korea	Luxembourg
Mexico	Netherlands
New Zealand	Norway
Poland	Portugal
Slovak Republic	Slovenia
Spain	Sweden
Switzerland	Turkey
United Kingdom	United States

Source: <http://www.oecd.org/about/membersandpartners/#d.en.194378>

## Appendix 6: Study quality ratings

**Table A2: Study quality ratings**

Author	1, Is a qualitative approach appropriate?			2, Is the study clear in what it seeks to do?		
	Appropriate	Inappropriate	Not sure	Clear	Unclear	Mixed
Andersen et al (2014)	x				x	
Hassandra et al (2009)	x			x		
Holliday et al (2009)	x			x		
Small et al (2013)	x			x		
Starkey et al (2009)	x			x		
Study Design & Data Collection	3, How defensible is the research design?			4, How well was the data collection carried out?		
	Defensible	Indefensible	Not sure	Appropriately	Inappropriately	Not sure
Andersen et al (2014)	x					x
Hassandra et al (2009)	x				x	
Holliday et al (2009)	x			x		
Small et al (2013)	x			x		
Starkey et al (2009)	x			x		
Validity	5, Is the role of the researcher clearly described?			6, Is the context clearly described?		

	Clear	Unclear	Not described	Clear	Unclear	Not sure
Andersen et al (2014)			x		x	
Hassandra et al (2009)			x	x		
Holliday et al (2009)			x	x		
Small et al (2013)	x				x	
Starkey et al (2009)			x		x	
<b>Validity (continued)</b>	<b>7, Were the methods reliable</b>					
	<b>Reliable</b>	<b>Unreliable</b>	<b>Not sure</b>			
Andersen et al (2014)			x			
Hassandra et al (2009)	x					
Holliday et al (2009)	x					
Small et al (2013)		x				
Starkey et al (2009)	x					
<b>Analysis</b>	<b>8, Is the data analysis sufficiently rigorous?</b>			<b>9, Is the data rich?</b>		
	<b>Rigorous</b>	<b>Not rigorous</b>	<b>Not sure / nor reported</b>	<b>Rich</b>	<b>Poor</b>	<b>Not sure / not reported</b>
Andersen et al (2014)			x		x	

Hassandra et al (2009)		x			x	
Holliday et al (2009)			x	x		
Small et al (2013)	x				x	
Starkey et al (2009)			x			x
<b>Analysis (continued)</b>	<b>10, Is the analysis reliable?</b>			<b>11, Are the findings convincing?</b>		
	<b>Reliable</b>	<b>Not reliable</b>	<b>Not sure/ not reported</b>	<b>Convincing</b>	<b>Not convincing</b>	<b>Not sure</b>
Andersen et al (2014)			x			x
Hassandra et al (2009)			x	x		
Holliday et al (2009)			x	x		
Small et al (2013)			x	x		
Starkey et al (2009)			x	x		
<b>Relevance and Conclusions</b>	<b>12, Are the findings relevant?</b>			<b>13, Conclusions</b>		
	<b>Relevant</b>	<b>Not relevant</b>	<b>Not sure</b>	<b>Adequate</b>	<b>Not adequate</b>	<b>Not sure</b>
Andersen et al (2014)	x			x		
Hassandra et al (2009)	x			x		

Holliday et al (2009)	x			x		
Small et al (2013)	x			x		
Starkey et al (2009)	x			x		

Ethics	Year	14, How clear and coherent is the reporting of ethics?			Overall assessment		
		Appropriate	Inappropriate	Not sure	++	+	-
Andersen et al (2014)				x		x	
Hassandra et al (2009)		x			x		
Holliday et al (2009)			x		x		
Small et al (2013)			x		x		
Starkey et al (2009)			x			x	

## **Appendix 7: Topic guide for peer supporter**

### **ASSIST Scotland research study**

#### **Topic guide for peer supporters**

Aim of the interview:

- Map their social network
- Use this map to explore the diffusion of ASSIST messages beyond the school environment
- Explore the context of these conversations and perceived influence on ego and alter
- Start the recruitment process for alter interview

#### **Introduction/Recap**

##### **Background Information**

Recap purpose of study

##### **Interview Format**

Format of in-depth interview (open questions, hearing their views)

No right or wrong answers – their views are important

Confidentiality and limits around disclosures of harm

Withdrawal at any time from interview as whole, or in not answering particular questions

Timing of interview (around 45 minutes)

Thank you payment (remember to get the receipt signed)

##### **Recording of Interview**

Digital recording of interviews – check they are happy with this

Report, use of quotations, anonymisation

Check if participant has any questions?

Check if happy to proceed?

##### **Consent**

Obtain consent, leave a copy of the consent form with the participant and return the other signed copy to the office.

## Section 1: Introduction

This section aims to encourage the student to think about their role as a peer supporter and start them thinking about the people they have spoken to about ASSIST.

- Warm up - tell me a bit about yourself
  - Probe: hobbies, activities, friends, family, weekend activities
  - Probe mode of communication – face to face, phone, text, online?
  
- What can you tell me about ASSIST?
  
- How would you describe your role as a peer supporter to someone that had never heard of it?
  
- How do you feel about being a peer supporter?
  - Probe: feelings about being nominated, likes/dislikes, reason for taking part, is it what they expected or not?
  
- Have you spoken to anyone about being a peer supporter?
  - Who?

## Section 2: Mapping Social Networks

The purpose of this section is to map the participant's social network. Ask participant to think about the people they feel close to and write their name on a post-it note. For each individual please add the following information to their post-it note:

- the first name of the person
- Their relationship to them (i.e., friend, mother, etc.),
- Age
- Whether they are a smoker or non-smoker (note tailor options for child and adult see Showcard A)
- Frequency of contact choose from one answer option (give them Showcard B) :

- 1 every day
  - 2 most days
  - 3 couple of days a week
  - 4 one a week
  - 5 2 or 3 times a month
  - 6 once a month or more
- Main mode of communication:
    - face to face
    - phone
    - text
    - online
    - other

Now give participant the blank sheet of paper with the concentric circles and write their name in the centre circle. Ask them to place each sticky note onto the piece of paper. They should rank them in order of closeness – i.e., the closer they are to the participant the closer they should be to the middle and vice versa. This will be their social network ‘map’.

Maps will then be used as a tool to facilitate further discussion. This may generate more people to add on the map or placement change of existing alter, this can easily be accommodated by adding or moving sticky notes.

Using coloured sticky dots the following two areas will be explored:

- **Red** dots will identify who on their map they have spoken to about smoking
- **Blue** dots will identify individuals who they think speaking to about smoking has changed their smoking behaviour, attitudes and knowledge in some way.
- Lastly **green** dots will identify people they think will be willing to take part in a face to face or telephone interview (discussed further below.)

To make sure you have captured everyone they have spoken to about smoking ask a second name generation question - is there anyone else you have spoken to about smoking in the last few weeks inside or outside of school? If yes add to map and collect characteristics.

Now probe:

- Why did they decide to speak to these people about smoking
- Why they did not speak to other people on their map?
- How did they communicate with people on their map about smoking? (e.g., mode of communication face to face, social media, text, phone)
- What was the alter reaction and what influence did this have on ego and alter?
- What did they discuss in relation to smoking?
- What is the perceived influence (if any) of these interactions on smoking behaviour, attitudes and knowledge?

### **Section 3: Alter recruitment**

The purpose of this section is to compile a sample list for alter interview (i.e., people on the participant's map). To identify 'alters' participants will be asked to look at their maps and identify (using a green dot) anyone who they have spoken to about ASSIST and would be happy to invite to take part in an interview. For each person the ego identifies they (i.e., the ego) will be given an invitation envelope. This will contain: an information leaflet and reply paid envelope which will allow people to opt-in.

### **Section 4: Reflections on mapping (if time permits)**

- What did the term '*people you feel close to*' mean to you? How did you decide who you felt close to or not?
- What are your thoughts on mapping your friends and family the way we did?
  - How easy or difficult was this?
  - Was there any part that you particularly liked and disliked? Probe reason why?
  - How did the map help you think about who you have spoken to about smoking?

**Section 5: Smoking status** (copied from ASSIST evaluation survey)

6) Now read all of these statements carefully and pick the box next to the one which describes you best (Please pick **ONE box only** and remember these questions are about **cigarettes**, not electronic cigarettes).

I have never smoked

1

**Go to question 7**

I have only ever tried smoking once

2

**Go to question 7**

I used to smoke sometimes but I never  
smoke a cigarette now

3

**Go to question 11**

I sometimes smoke cigarettes now but I  
don't smoke as many as one a week

4

**Go to question 9**

I usually smoke between one and six  
cigarettes a week

5

**Go to question 8**

I usually smoke more than six cigarettes  
a week

6

**Go to question 8**

7) Just to check, read these statements carefully and pick the box next to the one which describes you best (Please pick ONE box only).

I have never tried smoking a cigarette, not even a puff or two

1

**Go to question 13**

I did once have a puff or two of a cigarette, but I never smoke now

2

**Go to question 11**

I do sometimes smoke cigarettes

3

**Go to question 9**

8) When did you start smoking at least one cigarette a week?

Less than 3 months ago

1

**Go to question 9**

3 to 6 months ago

2

**Go to question 9**

7 months to 1 year ago

3

**Go to question 9**

More than one year ago

4

**Go to question 9**

**Section 6: Any other comments/questions?**

**Thank and close**

## **Appendix 8: Topic guide for Alter interview**

### **ASSIST Scotland research study**

#### **Topic guide for alters**

##### **Introduction/Recap**

##### **Background Information**

- Recap purpose of study

##### **Interview Format**

- Format of indepth interview (open questions, hearing their views)
- No right or wrong answers – their views are important
- Confidentiality and limits around disclosures of harm
- Withdrawal at any time from interview as a whole, or in not answering particular questions
- Timing of interview (around 45 minutes)
- Thank you payment (remember to get the receipt signed)

##### **Recording of Interview**

- Digital recording of interviews – check they are happy with this
- Report, use of quotations, anonymisation
- Check if participants have any questions?
- Check if happy to proceed?

##### **Consent**

- Obtain consent, leave a copy of the consent form with the participant and return the other signed copy to the office.

## Section 1: Introduction

- Warm up - tell me a bit about yourself
  - Probe: hobbies, activities, friends, family, weekend activities
  - How do they know [peer supporter], how would they describe them?

### 1) Awareness of ASSIST and ego role as peer supporter

- Do you know anything about the prevention programme xxx is taking part in called ASSIST?
  - *Probe:* purpose of ASSIST, mode of delivery.
- How do you think xxx felt when they found out that they had been nominated by their class mates to be a peer supporter?
- Why do you think they decided to take part?
  - **Probe:** Any concerns about participating? Did they feel they had a choice? Have they taken part in anything like this before (peer led projects)? How active are they in the school (e.g., pupil council)? Do they usually put themselves forward/get picked for things in school?

### 2) Conversations with ego about ASSIST

Introduce this section by clarifying that the purpose of ASSIST was to share smoking prevention messages

- Have you had any conversations with xxx about smoking after they attend their ASSIST training?
  - **Probe:** when, frequency and duration, where they take place and nature of conversation – i.e., feedback on training, practicing how to approach peers, facts about smoking harms, tobacco industry, anything about their peer supporter role in general (positive and negative – i.e., any concerns, confusion about what they are meant to be doing?)
- If participant is a smoker - has xxx spoken to you about your smoking behaviour?
  - **Probe:** how did this make them feel? Did it change their smoking behaviour? If yes, why and in what way? If not, why not?
- Do you know if xxx has spoken to anyone else about smoking?

- **Probe:** with whom, when, where, why, content, perceived influence?
- Is there anyone that the peer supporter has chosen not to speak to about smoking?
  - **Probe:** who, why not?

### **3) Reflections and closing comments (only if time permits)**

- Do they think ASSIST is a good idea or not? Why good/why not?
- How has ASSIST made a difference to XXX [peer supporter]?
- How has ASSIST made a difference to you, other people peer supporter has spoken to?
- Any other comments?

**Thank and close**

## Appendix 9: Information letter for parent/guardian



UNIVERSITY OF  
STIRLING

INSTITUTE FOR SOCIAL  
MARKETING

### ASSIST Research Study

University of Stirling & The Open  
University

Stirling FK9 4LA Scotland

## Information Sheet for Parents/Guardians

I would like to invite your child to take part in our research study. Before you decide, it is important that you understand why the research is being done and what it would involve for them.

Please take the time to read through the information here and contact me to discuss any questions you may have, or if anything is not clear. This information sheet tells you the purpose of the study and what will happen to your child if they take part.

### What is the purpose of the study?

I am a researcher working at your child's school to evaluate the ASSIST Scotland project. This is a new project which is being delivered in some schools across Scotland to improve students' health by reducing smoking.

### Why has my child been invited?

As part of this research I would like to talk to students who have been selected by their peers to be a 'peer supporter'. Their role as a peer supporter is to attend a two day training course and then share information with their peers to prevent them starting to smoke or encourage those who are to stop.

### What will happen to my child if they take part?

Your child will be invited to take part in a face to face interview which will be completed during school hours. The interview will explore their experience of being a peer supporter and who they have spoken to about ASSIST. To help them think about this they will draw a map of their social network with guidance from the researcher. Your child will also receive information about the interview and be able to ask questions before they make their decision. The interview will take about 45 minutes. They will receive a £10 Amazon voucher as a thank you for their time.

### Will the data you collect be confidential?

What your child tells me will be completely confidential unless they tell me something that makes me concerned for their safety or that of someone else. I will follow ethical and legal practice for the protection of your child's data. No-one except the research team will find out what they say. Interview data will be stored anonymously and held in a secure location that

can only be accessed by authorised members of the research team. Your child will not be named or identified in any way in the outputs from the study such as reports or presentations.

Before any research goes ahead it has to be approved by a Research Ethics Committee. This project has been approved by the University of Stirling Research Ethics Committee.

I hope you are happy for your child to participate. If you are, you do **NOT** need to do anything. If you have any questions or concerns about any aspect of the study, please contact Fiona Dobbie (telephone: 07811114469 or email: [fiona.dobbie@stir.ac.uk](mailto:fiona.dobbie@stir.ac.uk)).

If you would prefer your child **NOT to participate** in this research please call or text Fiona Dobbie on 07811114469 or email [fiona.dobbie@stir.ac.uk](mailto:fiona.dobbie@stir.ac.uk) by **3<sup>rd</sup> June 2016**.

Many thanks for your time,



Fiona Dobbie, Research Fellow  
ASSIST Scotland Evaluation Study (Stirling University)

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## Appendix 10: Peer supporter information sheet and consent form



UNIVERSITY OF  
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MARKETING

University of Stirling & The Open  
University

Stirling FK9 4LA Scotland

## ASSIST Research Study

### Information Sheet and consent form for Students

Hello, I am a researcher called Fiona. I would like to interview you about a smoking prevention project called ASSIST. You were selected by your peers to be a peer supporter for this project and I would like to learn more about your experience of being a peer supporter and who you have spoken to. To help you think about this we will make a map of your friends and family. Please read the information below before you decide if you want to join in.



If you would like to take part I will arrange a time to come into school and conduct your interview, which will last about 45 minutes. You will receive a £10 Amazon voucher as a thank you for your time. You do not have to take part and you can stop taking part at any point without having to give a reason.

The interview is completely confidential. This means that I will not tell anyone what you have told me, unless you tell me something that makes me worried for your safety or anyone else. I will record your interview and take this back to my office and make sure it is stored safely. When I write reports based on the research, you will not be named or identified in any way.

Before any research goes ahead it has to be approved by a Research Ethics Committee. They make sure that the research is fair. This project has been approved by the University of Stirling Research Ethics Committee.

**If you're happy to take part in an interview, please tick each box below.**

**I have read the information above.**

**I understand that I can choose to take part or not.**

Please  
initial  
each  
box

**I understand that I can stop taking part at any time.**

**I agree to take part in this study.**

**Signed .....****Date.....**

***What happens if I have some questions?***

If you have any questions please speak to me, your teacher or a Professor from the University using the contact details below.

Fiona Dobbie  
Research Fellow  
ASSIST Scotland  
University of Stirling  
Stirling FK9 4LA  
Tel: 01786 467369  
Email -[fiona.dobbie@stir.ac.uk](mailto:fiona.dobbie@stir.ac.uk)

Professor Jayne Donaldson  
Head of the School of Health  
Sciences  
University of Stirling  
Stirling FK9 4LA  
Tel: 01786 466345  
Email: [jayne.donaldson@stir.ac.uk](mailto:jayne.donaldson@stir.ac.uk)

## Appendix 11: Peer supporter recruitment questionnaire

### ASSIST Peer Supporter Interviews

If you would like to talk to Fiona about being a peer supporter for ASSIST please answer the questions below:

1) My name is: \_\_\_\_\_

2) So far I have had \_\_\_\_\_ conversations about smoking.

3) Please tick who you have spoken to

Someone in my year/class	
Teacher/other member of school staff	
Parent / carer	
Brother / sister	
Aunt / Uncle	
Grandparent	
Someone else (please tell me who e.g., friend of brother/sister, other family member, neighbour)	

Thank you very much for your interest. A teacher will be in touch to let you know if you will be interviewed and when this will be.

## Appendix 12: Alter opt-in invitations

### CONSENT TO CONTACT FORM ASSIST Peer Supporter Research Study

Please read the information sheet enclosed in this envelope before contacting us. Once you have read it, if you would like us to tell you more about the study and discuss whether or not you would like to take part please contact the study lead **Fiona Dobbie** on:

Mobile - **07811114469** or landline **01786 467369** or email [fiona.dobbie@stir.ac.uk](mailto:fiona.dobbie@stir.ac.uk)

Many thanks, we hope to hear from you soon!

A handwritten signature in black ink that reads "Fiona Dobbie .". The signature is written in a cursive style.

Fiona Dobbie

## **ASSIST Scotland research study – information for participants**

I would like to invite you to take part in a research study. Before you decide if you will take part, it is important for you to understand why the research is being done and what it will involve. Please take some time to read through the following information and discuss it with others if you wish before deciding if you will take part.

### ***What is the study about?***

ASSIST (A Stop Smoking in Schools Trial) is a school based programme to prevent smoking in young people aged 12-13. It works by training students to become 'peer supporters' who then talk to their friends about the risk of smoking and the benefits of not smoking. I am interested in learning more about who the peer supporters have spoken to about ASSIST and what influence this may have had.

### ***Why have I been invited to take part?***

You are being invited to take part in an interview, because a peer supporter has identified you as someone they have spoken to in some way about ASSIST. This could be sharing some information about smoking or talking about their role as a peer supporter. I would like to understand more about these conversations and your thoughts on ASSIST. You will receive a voucher for £10 to cover your time and expenses.

### ***What will happen if I take part?***

If you decide to take part you will be interviewed at time and place of your convenience. The kind of things I will talk to you about will be: the conversation(s) you have had with a peer supporter e.g., the content, how useful this was for you and/or the peer supporter; your thoughts on the peer supporter taking part in ASSIST and the programme in general. Interviews will last around 40 minutes and can be face to face or by telephone and will be digitally recorded and transcribed. You can ask to see a copy of your transcript.

### ***What are the positives and negatives of taking part?***

We hope that you will find it helpful to take part in the study. Sharing your experiences will help inform decisions around future roll out of ASSIST to other schools in Scotland. We do not think that there will be any negatives for you by taking part in the study. However, there is a list of useful contacts (on the back of this leaflet) should you wish to speak to a member of the research team at any point during the study.

### ***Do I have to take part?***

It is up to you whether you want to take part or not. If you decide to take part you will be asked to read and sign a consent form (or give consent verbally by telephone). You can withdraw from the study at any time and don't have to tell us why you don't want to take part anymore. You will receive a copy of this information sheet to keep.

### ***What happens after the research study?***

At the end of the study I will write a report and some journal articles. I will write a summary that we can send to you if you would like to see it. There will be no information about individual people and you will not be identified in any report or other publication.

***What about confidentiality?***

All data will be kept anonymously on a password protected computer or in a locked filing cabinet in a locked office. Only members of the Research Team will have access to the data.

***Who is organising and funding the study?***

The study is being carried out by Researchers at the UK Centre for Tobacco and Alcohol Studies (UKCTAS [www.ukctas.ac.uk](http://www.ukctas.ac.uk)), funded by the Scottish Government. Full ethical approval has been obtained from the University of Stirling's research ethics committee.

***What happens if there is a problem?***

If you have any concerns about the study please speak to the research study lead researcher Fiona Dobbie or the Head of the School of Health Sciences, Professor Jayne Donaldson using the contact details below.

Fiona Dobbie  
Research Fellow  
ASSIST Scotland  
University of Stirling  
Stirling FK9 4LA  
Tel: 01786 467369  
Email -[fiona.dobbie@stir.ac.uk](mailto:fiona.dobbie@stir.ac.uk)

Professor Jayne Donaldson  
Head of the School of Health  
Sciences  
University of Stirling  
Stirling FK9 4LA  
Tel: 01786 466345  
Email: [jayne.donaldson@stir.ac.uk](mailto:jayne.donaldson@stir.ac.uk)

***Useful contacts***

If you'd like to learn more about smoking in Scotland or speak to someone in confidence about your own or someone else's smoking here are some websites you can try.

[www.ashscotland.org.uk](http://www.ashscotland.org.uk)  
[www.canstopsmoking.com](http://www.canstopsmoking.com)



## **Appendix 13: Coding framework: peer supporters**

### **Coding frame**

#### **1. Background**

- 1.1 Family and place of residence – *use this code for any detail about their home life i.e., who they live where, where, for how long? Also add here any detail about school siblings attend.*
- 1.2 Friends
- 1.3 Hobbies
- 1.4 Peer supporter smoking status
- 1.5 Length of time at high school and proximity from home to school
- 1.6 mode of communication in general (but not for specific for ASSIST message diffusion see 3.1 and 6.4 for alter characteristics)

#### **2. ASSIST**

- 2.1 Define ASSIST and their role as a peer supporter
- 2.2 Peer nomination and training – *code here any thoughts on being nominated and invited to take part in programme – happy, not bothered, anxious, any change after attending the training. Also code any general thoughts on ASSIST training days*
- 2.3 Peer supporter role - *thoughts on their role as peer supporter and what they have gained from being a peer supporter.*
- 2.4 Thoughts on school taking part in ASSIST

#### **3. Conversations about smoking**

- 3.1 Who, where, how, why and when conversation took place
- 3.2 Content of discussion/message
- 3.3 Number of conversations, how/why they decided on the number of conversations to have and when / why to stop.
- 3.4 Ego feelings speaking to alter (i.e., worry apprehension discomfort)
- 3.5 Ego perception of alter reaction to, or behaviour change as a result of, the conversation
- 3.6 Conversations with other peer supporters - purpose and content
- 3.7 Reasons for not having conversations or for not talking to people on their map

#### **4. Making maps**

- 4.1 Interviewer instruction for making maps (i.e., how did I explain the process)
- 4.2 Interviewer instruction for follow-up dots

- 4.3 Name generation question(s) - how they define closeness? Examples of asking different name generation questions
- 4.4 Alter selection, placement and rationale for adding or placement - how easy or difficult did they find this process?
- 4.5 Examples where interviewer prompts for alters to add to map or alters added later on int interview
- 4.6 Ego feedback on interview and making maps
- 4.7 Alter recruitment

## **5. Miscellaneous**

- 5.1 Potential application of sociograms into ASSIST programme esp. follow ups (i.e., might prompt better idea of who they could speak to)

## Appendix 14: Sample of abstraction process to create thematic analysis

The table below is copied from my excel workbook which I used to create the theme ‘perception of influence.’ First in column B I copied the coded data from NVivo. As this the raw data from the transcripts I have excluded it from this example for confidentiality reasons. Then I summarised the key points from the verbatim text (Colum D). Next these summarises were grouped and re-ordered into categories (Colum F) and then preliminary themes created in Colum G.

### Perceptions of conversation influence

A) Res ID	B) Data coded in Nvivo	C) Res ID	D) Summary of data code in Nvivo	E) Res ID	F) Summary points re-ordered into more refined categories	G) Preliminary themes
	This is where the raw data from the transcripts coded in Nvivo would be added but this has been removed to protect participant confidentiality	stm8	Mum knows that smoking is worse than she thought p60.	STM1	Friend didn't know there were so much chemicals – thoughts it was disgusting and was going to tell her mum and ad because they smoke p88	Positive perceptions of influence - cascading message diffusion
		stp5	Had one conversation with her dad – told him the number of chemical in a cigarette but didn't bother with any more because he didn't look that bothered. (p63)	stm2	Ego spoke to little sister who is now telling her friends, so is like a peer supporter P101	Positive perceptions of influence - cascading message diffusion
		stp1	Happy conversation with sister in law because she stopped p84	stm3	Alter plans to tell their friend about the chemicals in a cigarette p102	Positive perceptions of influence - cascading message diffusion
		STM1	Friend didn't know there were so much chemicals – thoughts it was disgusting and was going to tell her mum and ad because they smoke p88	stp7	Ego told fact o friends and one of them told his mum p111.	Positive perceptions of influence - cascading message diffusion

		stp7	Spoke to friend who learned new info which he shared with his mum P90	stm2	Ego spoke to little sister who is now telling her friends, so is like a peer supporter P101	Positive perceptions of influence - cascading message diffusion
		stp8	Spoke to friend who said smoking was disgusting and he wouldn't smoke again, was going to try and get his mum and family to stop. Ego acknowledged that wanted to stop but feels they did help him (p91).	stm8	Mum knows that smoking is worse than she thought p60.	Positive perceptions of influence - change in alter smoking behaviour, knowledge or attitudes
		stm2	Ego spoke to little sister who is now telling her friends, so is like a peer supporter P101	stp1	Happy conversation with sister in law because she stopped p84	Positive perceptions of influence - change in alter smoking behaviour, knowledge or attitudes
		stm3	Alter plans to tell their friend about the chemicals in a cigarette p102	stp6	Gran is trying to cut down, she wasn't aware of danger so ego thinks her conversation has put her off p110.	Positive perceptions of influence - change in alter smoking behaviour, knowledge or attitudes
		stp6	Gran is trying to cut down, she wasn't aware of danger so ego thinks her conversation has put her off p110.	stp8	Ego told mum but she already knew all her facts because she is trying to quit. Feels mum is happy with her because she is trying to help her p112	Positive perceptions of influence - change in alter smoking behaviour, knowledge or attitudes
		stp7	Ego told fact o friends and one of them told his mum p111.	stp3	Ego thinks alter still smokes – thinks he learned something about smoking harm but hasn't taken it in p113	Positive perceptions of influence - change in alter smoking behaviour, knowledge or attitudes
		stp8	Ego told mum but she already knew all her facts because she is trying to quit. Feels mum is happy with her because she is trying to help her p112	stm8	Positive was interested to hear what ego had to say (p84)	Positive perceptions of influence - change in alter smoking behaviour, knowledge or attitudes

		stp3	Ego thinks alter still smokes – thinks he learned something about smoking harm but hasn't taken it in p113	stp5	Positive didn't know that there were 4,000 chemicals in a cigarette (p85)	Positive perceptions of influence - change in alter smoking behaviour, knowledge or attitudes
		stp3	None of egos alters smoke so doesn't think the facts they shared made any difference p113	stm6	Said they would stop smoking p104/105	Positive perceptions of influence - change in alter smoking behaviour, knowledge or attitudes
		Stp4	Ego hit her gran with the facts but doesn't think it will change her smoking behaviour, but she did think it was good that ego was learning about smoking harms p114.	stm7	Delay smoking initiation in alters p105	Positive perceptions of influence - change in alter smoking behaviour, knowledge or attitudes
		stm2	Ego spoke to little sister who is now telling her friends, so is like a peer supporter P101	stm8	New knowledge about the chemicals inside a cigarette p106	Positive perceptions of influence - change in alter smoking behaviour, knowledge or attitudes
		stm8	Positive was interested to hear what ego had to say (p84)	stm8	Father now smokes outside as a result of their conversation and brother?? Doesn't smoke around son and leave the room, will pull over when driving and smoke outside of car P106/7	Positive perceptions of influence - change in alter smoking behaviour, knowledge or attitudes
		stp5	Positive didn't know that there were 4,000 chemicals in a cigarette (p85)	stp5	New info for mum re danger of second hand smoking and said she no longer wanted to smoke and now smokes outside P108	Positive perceptions of influence - change in alter smoking behaviour, knowledge or attitudes
		stm3	Dad not interested – but that can be the same reaction for other conversations they have so not specific to smoking p102	stp5	Had one conversation with her dad – told him the number of chemical in a cigarette but didn't bother with any more because he didn't look that bothered. (p63)	Negative perceptions of influence - disinterest

		stm4	Ego sp0oek to friend who was disengaged – trying to act cool - 104	Stp4	Ego hit her gran with the facts but doesn't think it will change her smoking behaviour, but she did think it was good that ego was learning about smoking harms p114.	Negative perceptions of influence - disinterest
		stm6	Said they would stop smoking p104/105	stm3	Dad not interested – but that can be the same reaction for other conversations they have so not specific to smoking p102	Negative perceptions of influence - disinterest
		stm7	Delay smoking initiation in alters p105	stp1	Feels like alter doesn't care (ego speaking to a friend) p107	Negative perceptions of influence - disinterest
		stm8	New knowledge about the chemicals inside a cigarette p106	stm4	Ego sp0oek to friend who was disengaged – trying to act cool -104	Negative perceptions of influence - acting cool
		stm8	Father now smokes outside as a result of their conversation and brother?? Doesn't smoke around son and leave the room, will pull over when driving and smoke outside of car P106/7	stp1	Listen but still has an attitude – ego not sure if he will try or not P107	Negative perceptions of influence - acting cool
		stp1	Feels like alter doesn't care (ego speaking to a friend) p107	stp3	None of egos alters smoke so doesn't think the facts they shared made any difference p113	Negative perceptions of influence - not relevant
		stp1	Listen but still has an attitude – ego not sure if he will try or not P107			
		stp5	New info for mum re danger of second hand smoking and said she no longer wanted to smoke and now smokes outside P108			



## References

- ALEXANDER, M. C., THOMAS, G. B., LORRAINE, T., LIS, N. & JULIE, R. 2012. What football teaches us about complex health interventions. *BMJ: British Medical Journal*, 345, 25-27.
- ALOISE-YOUNG, P. A., GRAHAM, J. W. & HANSEN, W. B. 1994. Peer Influence on Smoking Initiation During Early Adolescence: A Comparison of Group Members and Group Outsiders. *Journal of applied psychology*, 79, 281-287.
- AMOS, A., ANGUS, K, BOSTOCK, Y, FIDLER, J & HASTINGS, G. 2009. A Review of Young People and Smoking in England. *Public Health England Consortium*.
- AMOS, A. & BOSTOCK, Y. 2007. Young people, smoking and gender—a qualitative exploration. *Health Education Research*, 22, 770-781.
- AMOS, A., GREAVES, L., NICTER, M. & BLOCH, M. 2012. Women and tobacco: a call for including gender in tobacco control research, policy and practice. *BMJ Publishing Group Ltd*.
- ANDERSEN, A., BAST, L. S., RINGGAARD, L. W., WOHLLEBE, L., JENSEN, P. D., SVENDSEN, M., DALUM, P. & DUE, P. 2014a. Design of a school-based randomized trial to reduce smoking among 13 to 15-year olds, the X:IT study. *BMC public health*, 14, 518-518.
- ANTONUCCI, T. 1986. MEASURING SOCIAL SUPPORT NETWORKS: Hierarchical mapping technique. *Journal of the American Society of Aging*, 10(4), 10-12.
- ASH SCOTLAND., & NHSGGC. 2015. Tobacco-Free Schools - Helping You Achieve It.
- AUDREY, S., HOLLIDAY, J. & CAMPBELL, R. 2006. It's good to talk: Adolescent perspectives of an informal, peer-led intervention to reduce smoking. *Social science & medicine (1982)*, 63, 320-334.
- AUDREY, S., HOLLIDAY, J. & CAMPBELL, R. 2008. Commitment and compatibility: Teachers' perspectives on the implementation of an effective school-based, peer-led smoking intervention. *Health education journal*, 67, 74-90.
- AYAZ, S. & AÇIL, D. 2015. Comparison of Peer Education and the Classic Training Method for School Aged Children Regarding Smoking and its Dangers. *Journal of pediatric nursing*, 30, e3-e12.
- BACKETT-MILBURN, K. 2000. Understanding peer education: insights from a process evaluation. *Health education research*, 15, 85-96.
- BARMAN, S. K., PULKKINEN, L., KAPRIO, J. & ROSE, R. J. 2004. Inattentiveness, parental smoking and adolescent smoking initiation. *Addiction*, 99, 1049-1061.
- BAULD, L., BRANDLING, J. & TEMPLETON, L. 2009. Facilitators and barriers to the delivery of school-based interventions to prevent the uptake of smoking among children: A systematic review of qualitative research. *UK Centre for Tobacco Control Studies*.
- BEARMAN, P. & PARIGI, P. 2004. Cloning Headless Frogs and Other Important Matters: Conversation Topics and Network Structure. *Social Forces*, 83, 535-557.
- BELL, S. L., AUDREY, S., COOPER, A. R., NOBLE, S. & CAMPBELL, R. 2017. Lessons from a peer-led obesity prevention programme in English schools. *Health promotion international*, 32, 250-259.
- BELLOTTI, E. 2015. *Qualitative networks : mixed methods in sociological research*, Abingdon, Abingdon : Routledge.
- BELLOTTI, E. 2016. Qualitative Methods and Visualizations in the Study of Friendship Networks. *Sociological research online*, 21, 198-216.
- BENJAMIN, R. M. 2012. A NEW SURGEON GENERAL'S REPORT: PREVENTING TOBACCO USE AMONG ADOLESCENTS AND YOUNG ADULTS. *Public Health Reports*, 127, 360-361.

- BERKMAN, L. F. & LEONARD SYME, S. 2017. Social networks, host resistance, and mortality: A nine-year follow-up study of alameda county residents. *American journal of epidemiology*, 185, 1070-1088.
- BILGIÇ, N. & GÜNAY, T. 2018. Evaluation of effectiveness of peer education on smoking behavior among high school students. *Saudi medical journal*, 39, 74-80.
- BLAIKIE, N. 2019. *Designing Social Research: The Logic of Anticipation*, Newark: Polity Press.
- BOARD ON POPULATION HEALTH AND PUBLIC HEALTH, P., HEALTH AND MEDICINE, D., NATIONAL ACADEMIES OF SCIENCES, E. A. M. & COMMITTEE ON THE REVIEW OF THE HEALTH EFFECTS OF ELECTRONIC NICOTINE DELIVERY, S. 2018. *Public Health Consequences of E-Cigarettes*, National Academies Press.
- BORGATTI, S. P. 2013. *Analyzing social networks*, London, London : SAGE Publications Ltd.
- BRAUN, V. & CLARKE, V. 2006. Using thematic analysis in psychology. *Qualitative research in psychology*, 3, 77-101.
- BRESLAU, N. & PETERSON, E. 1996a. Smoking cessation in young adults: Age at initiation of cigarette smoking and other suspected influences. *American Journal of Public Health*, 86, 214-20.
- BRINN, M. P., CARSON, K. V., ESTERMAN, A. J., CHANG, A. B. & SMITH, B. J. 2010. Mass media interventions for preventing smoking in young people. *Cochrane database of systematic reviews*, CD001006-CD001006.
- BRITTEN, J. 2006. Guidance on the Conduct of Narrative Synthesis in Systematic Reviews: A Product from the ESRC Methods Programme.
- BROADHEAD, R. S., VOLKANEVSKY, V. L., RYDANOVA, T., RYABKOVA, M., BORCH, C., VAN HULST, Y., FULLERTON, A., SERGEYEV, B. & HECKATHORN, D. D. 2006. Peer-driven HIV interventions for drug injectors in Russia: First year impact results of a field experiment. *The International journal of drug policy*, 17, 379-392.
- BROWN, T., PLATT, S. & AMOS, A. 2014. Equity impact of interventions and policies to reduce smoking in youth: Systematic review. *Tobacco Control: An International Journal*, 23, e98-e105.
- BUSWELL, M. & DUNCAN, P. 2013. Ambivalence and fluidity in the teenage smoking and quitting experience: lessons from a qualitative study at an English secondary school. Health Education Authority.
- CAMPBELL, R., STARKEY, F., HOLLIDAY, J., AUDREY, S., BLOOR, M., PARRY-LANGDON, N., HUGHES, R. & MOORE, L. 2008a. An informal school-based peer-led intervention for smoking prevention in adolescence (ASSIST): a cluster randomised trial. *The Lancet (British edition)*, 371, 1595-1602.
- CARSON, K. V., BRINN, M. P., LABISZEWSKI, N. A., ESTERMAN, A. J., CHANG, A. B. & SMITH, B. J. 2011. Community interventions for preventing smoking in young people. *Cochrane Database of Systematic Reviews*, 2013, CD001291-CD001291.
- CAWLEY, J., MARKOWITZ, S. & TAURAS, J. 2004. Lighting up and slimming down: the effects of body weight and cigarette prices on adolescent smoking initiation. *Journal of health economics*, 23, 293-311.
- CHEN, C.-Y., WU, C.-C., CHANG, H.-Y. & YEN, L.-L. 2014. The effects of social structure and social capital on changes in smoking status from 8th to 9th grade: Results of the Child and Adolescent Behaviors in Long-term Evolution (CABLE) study. *Preventive Medicine*, 62, 148-154.
- CHOI, H. J. & SMITH, R. A. 2013. Members, Isolates, and Liaisons: Meta-Analysis of Adolescents' Network Positions and Their Smoking Behavior. *Substance use & misuse*, 48, 612-622.
- CHRISTAKIS, N. A. 2010. *Connected : amazing power of social networks and how they shape our lives*, London, London : HarperPress.

- CHRISTAKIS, N. A. & FOWLER, J. H. 2007. The Spread of Obesity in a Large Social Network over 32 Years. *The New England journal of medicine*, 357, 370-379.
- CHRISTAKIS, N. A. & FOWLER, J. H. 2008. The Collective Dynamics of Smoking in a Large Social Network. *The New England journal of medicine*, 358, 2249-2258.
- COLE, P. 2000. Drugs Education at the Transition from Primary to Secondary School: The pupils' views. *Educational review (Birmingham)*, 52, 55-63.
- CONRAD, K. M., FLAY, B. R. & HILL, D. 1992. Why children start smoking cigarettes: predictors of onset. *British Journal of Addiction*, 87, 1711-1724.
- COOPER, K., BOOTH, A. & CARROLL, C. 2011. A worked example of "best fit" framework synthesis: A systematic review of views concerning the taking of some potential chemopreventive agents. 11, 29-29.
- CRAIG, P. *Taking account of context in population health intervention research : guidance for producers, users and funders of research.*
- CRESWELL, J. W. 2013. *Research design : qualitative, quantitative, and mixed methods approaches*, Los Angeles, Calif. : London, Los Angeles, Calif. : London : Sage.
- CROSSLEY, N. (2010) The Social World of the Network. Combining Qualitative and Quantitative Elements in Social Network Analysis. *Sociologica*(1): 0.
- CROSSLEY, N., BELLOTTI, E., EDWARDS, G., EVERETT, M. G., KOSKINEN, J. H. & TRANMER, M. 2015. *Social Network Analysis for Ego-Nets: Social Network Analysis for Actor-Centred Networks*, London, London: SAGE Publications.
- CROSSLEY, N. & EDWARDS, G. 2016. Cases, Mechanisms and the Real: The Theory and Methodology of Mixed-Method Social Network Analysis. *Sociological Research Online*, 21, 1-15.
- CURRIE, C., LEVIN, K., KIRBY, J., CURRIE, D., VAN DER SLUIJS, W. & INCHLEY, J. 2011. Health behaviour in school-aged children: world health organization collaborative cross-national study (HBSC) Findings from the 2010 HBSC Survey in Scotland.
- CURRIE, C., GABHAINN, S., GODEAU, E., ROBERTS, S., CURRIE, D., PICKET, W., RICHTER, M., MORGAN, A. & BARNEKOW, V. 2008. Inequalities in Young People's Health: HBSC International Report from the 2005/2006 Survey.
- CURRIE, C., HURRELMANN, K., SETTERTOBULTE, W., SMITH, R. & TODD, J. 2000. Health and Health Behaviour among Young People. Health Behaviour in School-aged Children: a WHO Cross-National Study (HBSC) International Report.
- CURRIE, C., INCHLEY, J., MOLCHO, M., LENZI, M., VESELSKA, Z. & WILS, F. Health Behaviour in School-aged children (HBSC) Study Protocol: Background, Methodology and Mandatory items for the 2013/2014 Survey. *In: 2014* (ed.).
- CURRIE, C., ROBERTS, C., MORGAN, A., SMITH, R., SETTERTOBULTE, W., SAMDAL, O. & RASMUSSEN, V. 2004. Young people's health in context. Health Behaviour in School-aged Children (HBSC) study: international report from the 2001/2002 survey.
- CURRIE, C., VAN DER SLUIJS, W., WHITEHEAD, R., CURRIE, D., RHODES, G., NEVILLE, F. & INCHLEY, J. 2015. HBSC 2014 Survey in Scotland National Report.
- CURRIE, C., ZANOTTI, C., MORGAN, A., CURRIE, D., DE LOOZE, M., ROBERTS, C., SAMDAL, O., SMITH, O. & BARNEKOW, V. 2012. Social determinants of health and well-being among young people. Health Behaviour in School-aged Children (HBSC) study: international report from the 2009/2010 survey.
- DAVIES, S. C. M., WINPENNY, E. P., BALL, S. P., FOWLER, T. P., RUBIN, J. P. & NOLTE, E. D. 2014. For debate: a new wave in public health improvement. *The Lancet (British edition)*, 384, 1889-1895.
- DE VRIES, H., CANDEL, M., ENGELS, R. & MERCKEN, L. 2006. Challenges to the peer influence paradigm: results for 12–13 year olds from six European countries from the European Smoking Prevention Framework Approach study. *Tobacco control*, 15, 83-89.

- DERZON, J. H. & LIPSEY, M. W. 1999. Predicting tobacco use to age 18: a synthesis of longitudinal research. *Addiction (Abingdon, England)*, 94, 995-1006.
- DISTEFAN, J. M., GILPIN, E. A., CHOI, W. S. & PIERCE, J. P. 1998. Parental influences predict adolescent smoking in the United States, 1989–1993. *Journal of Adolescent Health*, 22, 466-474.
- DIXON-WOODS, M., AGARWAL, S., JONES, D., YOUNG, B. & SUTTON, A. 2005. Synthesising qualitative and quantitative evidence: a review of possible methods. Great Britain: CHURCHILL LIVINGSTONE.
- DIXON-WOODS, M., BONAS, S., BOOTH, A., JONES, D. R., MILLER, T., SUTTON, A. J., SHAW, R. L., SMITH, J. A. & YOUNG, B. 2006. How can systematic reviews incorporate qualitative research? A critical perspective. Great Britain: SAGE PUBLICATIONS.
- DOBBIE, F., ANGUS, K., LITTLECOTT, H., ALLUM, K., WELLS, V., AMOS, A., HAW, S. & BAULD, L. 2018. Facilitators and barriers to the delivery of school-based smoking prevention interventions for children and young people: a protocol for a systematic review of qualitative studies. *Systematic reviews*, 7, 56-56.
- DOBBIE F., PURVES, R., MCKELL, J., DOUGALL, N., WHITE, J., CAMPBELL, R., AMOS, A., MOORE, L., & BAULD, L (2017). A process evaluation of the implementation of ASSIST in Scotland: Final Report. ASP Group, Scottish Government
- DOBBIE, F., PURVES, R., MCKELL, J., DOUGALL, N., CAMPBELL, R., WHITE, J., AMOS, A., MOORE, L. & BAULD, L. 2019. Implementation of a peer-led school based smoking prevention programme: a mixed methods process evaluation. *BMC public health*, 19, 742-742.
- DOBBIE, F., REITH, G. & MCCONVILLE, S. 2017. Utilising social network research in the qualitative exploration of gamblers' social relationships. *Qualitative research : QR*, 18, 207-223.
- DOLCINI, M., ADLER, N. & GINSBERG, D. 1996. Factors influencing agreement between self-reports and biological measures of smoking among adolescents. *Journal of Research on Adolescence*, 6, 515-542.
- DOMÍNGUEZ, S. & HOLLSTEIN, B. 2014. *Mixed methods social networks research design and applications*, New York, NY, New York, NY : Cambridge University Press.
- DONATELLE, R. J., PROWS, S. L., CHAMPEAU, D. & HUDSON, D. 2000. Randomised controlled trial using social support and financial incentives for high risk pregnant smokers: Significant Other Supporter (SOS) program. *Tobacco control*, 9, iii67-69.
- EDWARDS, G. 2010. Mixed Methods Approaches to Social Network Analysis, National Centre for Research Methods (UK) Review Paper.
- EDWARDS, G. & CROSSLEY, N. 2009. Measures and Meanings: Exploring the Ego-Net of Helen Kirkpatrick Watts, Militant Suffragette. *Methodological Innovations*, 4, 37-61.
- EMMEL, N. A. C., A 2009. 'The methods used in Connected Lives: Investigating networks, neighbourhoods and communities', Real Life Methods, the Manchester/Leeds Node of the ESRC National Centre for Research Methods, ncrm.ac.uk.
- ENNETT, S. T., BAUMAN, K. E. & KOCH, G. G. 1994. Variability in cigarette smoking within and between adolescent friendship cliques. *Addictive behaviors*, 19, 295-305.
- ENNETT, S. T. & BAUMAN, K. E. 1993. Peer Group Structure and Adolescent Cigarette Smoking: A Social Network Analysis. *Journal of health and social behavior*, 34, 226-236.
- ENNETT, S. T., FARIS, R., HIPPI, J., FOSHEE, V. A., BAUMAN, K. E., HUSSONG, A. & CAI, L. 2008. Peer Smoking, Other Peer Attributes, and Adolescent Cigarette Smoking: A Social Network Analysis. *Prevention science*, 9, 88-98.

- EVIDENCE TO IMPACT. 2014. ASSIST Smoking Prevention Programme (Scotland): delivery manual.
- EVIDENCE TO IMPACT. <http://evidencetoimpact.com/assist/> [Online]. [Accessed 21st December 2020].
- EYSENBACH, G., POWELL, J., ENGLESAKIS, M., RIZO, C. & STERN, A. 2004. Health related virtual communities and electronic support groups: systematic review of the effects of online peer to peer interactions. *BMJ*, 328, 1166-1170.
- FABER, T., KUMAR, A., MACKENBACH, J. P., MILLETT, C., BASU, S., SHEIKH, A. & BEEN, J. V. 2017. Effect of tobacco control policies on perinatal and child health: a systematic review and meta-analysis. *The Lancet. Public health*, 2, e420-e437.
- FANSHAW, T. R., HALLIWELL, W., LINDSON, N., AVEYARD, P., LIVINGSTONE-BANKS, J. & HARTMANN-BOYCE, J. 2017. Tobacco cessation interventions for young people. *Cochrane library*, 2017, CD003289-CD003289.
- FISHER, L. A. & BAUMAN, K. E. 1988. Influence and Selection In the Friend-adolescent Relationship: Findings from Studies of Adolescent Smoking and Drinking. *Journal of applied social psychology*, 18, 289-314.
- FLAY, B. R. 2009. The promise of long-term effectiveness of school-based smoking prevention programs: A critical review of reviews. *Tobacco induced diseases*, 5, 7-7.
- FLAY, B. R., PHIL, D., HU, F. B. & RICHARDSON, J. 1998. Psychosocial Predictors of Different Stages of Cigarette Smoking among High School Students. *Preventive medicine*, 27, A9-A18.
- FLETCHER, A., BONELL, C. & SORHAINDO, A. 2011. You are what your friends eat: systematic review of social network analyses of young people's eating behaviours and bodyweight. *Journal of epidemiology and community health (1979)*, 65, 548-555.
- FORREST, S., STRANGE, V. & OAKLEY, A. 2002. A Comparison of Students' Evaluations of a Peer-delivered Sex Education Programme and Teacher-led Provision. *Sex education*, 2, 195-214.
- FULLER, E., HAWKINS, V. 2014. Smoking, drinking and drug use among young people in England in 2013. *Health and Social Care Information Centre*
- GALOBARDES, B., SHAW, M., LAWLOR, D. A., LYNCH, J. W. & DAVEY SMITH, G. 2006. Indicators of socioeconomic position ( part 1). *Journal of Epidemiology and Community Health*, 60, 7.
- GLENN, N. M., LAPALME, J., MCCREADY, G. & FROHLICH, K. L. 2017. Young adults' experiences of neighbourhood smoking-related norms and practices: A qualitative study exploring place-based social inequalities in smoking. *Social science & medicine (1982)*, 189, 17-24.
- GODDARD, E. 1992. Why children start smoking. *British Journal of Addiction*, 87, 17-18.
- GORBER, S. C., SCHOFIELD-HURWITZ, S., HARDT, J., LEVASSEUR, G., AMP, EGRAVE, VE & TREMBLAY, M. 2009. The accuracy of self-reported smoking: A systematic review of the relationship between self-reported and cotinine-assessed smoking status. *Nicotine and Tobacco Research*, 11, 12-24
- GOUGH, D., OLIVER, S., THOMAS, J. 2012. An introduction to systematic reviews. *London: SAGE*.
- GREEN, J. 2015. *Health promotion : planning and strategies*, Los Angeles, Los Angeles : SAGE.
- GRIESBACH, D., AMOS, A. & CURRIE, C. 2003. Adolescent smoking and family structure in Europe. *Social Science & Medicine*, 56, 41-52.
- GRIFFIN, K. W. & BOTVIN, G. J. 2010. Evidence-Based Interventions for Preventing Substance Use Disorders in Adolescents. *Child and Adolescent Psychiatric Clinics of North America*, 19, 505-526.

- GROGAN, S., CONNER, M., FRY, G., GOUGH, B. & HIGGINS, A. 2009. Gender differences in smoking: A longitudinal study of beliefs predicting smoking in 11-15 year olds. *Psychology & Health*, 24, 301-316.
- HALL, J. A. & VALENTE, T. W. 2007. Adolescent smoking networks: The effects of influence and selection on future smoking. *Addictive behaviors*, 32, 3054-3059.
- HANSON, M. & CHEN, E. 2007. Socioeconomic Status and Health Behaviors in Adolescence: A Review of the Literature. *Journal of Behavioral Medicine*, 30, 263-285.
- HARDEN, A., OAKLEY, A. & OLIVER, S. 2001. Peer-delivered health promotion for young people: A systematic review of different study designs. *Health Education Journal*, 60, 339-353.
- HARRIS, J. B., SCHWARTZ, S. M. & THOMPSON, B. 2008. Characteristics Associated with Self-Identification as a Regular Smoker and Desire to Quit Among College Students Who Smoke Cigarettes. *Nicotine & Tobacco Research*, 10, 69-76.
- HASSANDRA, M., THEODORAKIS, Y., KOSMIDOU, E., GRAMMATIKOPOULOS, V. & HATZIGEORGIADIS, A. 2009. I do not smoke - I exercise: A pilot study of a new educational resource for secondary education students. Sweden: SAGE.
- HEANEY, C. A., & ISRAEL, B. A. 2008. *Social networks and social support*. In: IN K. GLANZ, B. K. R., & K. VISWANATH (EDS.) (ed.) *Health behavior and health education: Theory, research, and practice* (p. 189-210). Jossey-Bass.
- HEATH, S., FULLER, A. & JOHNSTON, B. 2009b. Chasing shadows: defining network boundaries in qualitative social network analysis. *Qualitative Research*, 9, 645-661.
- HEFLER, M., LIBERATO, S. C. & THOMAS, D. P. 2017. Incentives for preventing smoking in children and adolescents. *Cochrane Database of Systematic Reviews*, 2018, CD008645-CD008645.
- HIGGINS JPT, G. S. E. Cochrane Handbook for Systematic Reviews of Interventions Version 5.1.0 [updated March 2011]. The Cochrane Collaboration, 2011. Available from [www.handbook.cochrane.org](http://www.handbook.cochrane.org).
- HILL, M. 2006. Children's Voices on Ways of Having a Voice: Children's and young people's perspectives on methods used in research and consultation. *Childhood*, 13, 69-89.
- HISCOCK, R., BAULD, L., AMOS, A., FIDLER, J. A. & MUNAFÒ, M. 2012a. Socioeconomic status and smoking: a review. *Annals of the New York Academy of Sciences*, 12481, 107-123.
- HISCOCK, R., BAULD, L., AMOS, A. & PLATT, S. 2012b. Smoking and socioeconomic status in England: the rise of the never smoker and the disadvantaged smoker. *Journal of Public Health*, 34, 390-396.
- HITCHMAN, S. C., FONG, G. T., ZANNA, M. P., THRASHER, J. F. & LAUX, F. L. 2014. The Relation Between Number of Smoking Friends, and Quit Intentions, Attempts, and Success: Findings From the International Tobacco Control (ITC) Four Country Survey. *Psychology of addictive behaviors*, 28, 1144-1152.
- HOFFMAN, B. R., MONGE, P. R., CHOU, C.-P. & VALENTE, T. W. 2007. Perceived peer influence and peer selection on adolescent smoking. *Addictive behaviors*, 32, 1546-1554.
- HOFFMAN, B. R., SUSSMAN, S., UNGER, J. B. & VALENTE, T. W. 2006. Peer Influences on Adolescent Cigarette Smoking: A Theoretical Review of the Literature. *Substance Use & Misuse*, 41, 103-155.
- HOGAN, B., CARRASCO, J. A. & WELLMAN, B. 2007. Visualizing Personal Networks: Working with Participant-aided Sociograms. *Field Methods*, 19, 116-144.
- HOGAN, B., MELVILLE, J. R., PHILIPS, G. L., JANULIS, P., CONTRACTOR, N., MUSTANSKI, B. S. & BIRKETT, M. 2016. Evaluating the paper-to-screen translation of participant-aided sociograms with high-risk participants.
- HOLLIDAY, J. 2006. Identifying and using influential young people for informal peer-led health promotion. ProQuest Dissertations Publishing.

- HOLLIDAY, J., AUDREY, S., CAMPBELL, R. & MOORE, L. 2016. Identifying Well-Connected Opinion Leaders for Informal Health Promotion: The Example of the ASSIST Smoking Prevention Program. *Health communication*, 31, 946-953.
- HOLLIDAY, J., AUDREY, S., MOORE, L., PARRY-LANGDON, N. & CAMPBELL, R. 2009. High fidelity? How should we consider variations in the delivery of school-based health promotion interventions? Great Britain: HEALTH EDUCATION AUTHORITY.
- HOLLINGWORTH, W., COHEN, D., HAWKINS, J., HUGHES, R. A., MOORE, L. A. R., HOLLIDAY, J. C., AUDREY, S., STARKEY, F. & CAMPBELL, R. 2011. Reducing Smoking in Adolescents: Cost-Effectiveness Results From the Cluster Randomized ASSIST (A Stop Smoking In Schools Trial). *Nicotine & tobacco research*, 14, 161-168.
- HOLLSTEIN, B. 2011. Qualitative Approaches In: P, S. J. C. (ed.) *The Sage Handbook of Social Network Analysis*. London: Sage.
- HOUSE, J., LANDIS, K. & UMBERSON, D. 1988. Social relationships and health. *Science (American Association for the Advancement of Science)*, 241, 540-545.
- HOVING, C., REUBSAET, A. & DE VRIES, H. 2007. Predictors of smoking stage transitions for adolescent boys and girls. *Preventive Medicine*, 44, 485-489.
- HUANG, G. C., SOTO, D., FUJIMOTO, K. & VALENTE, T. W. 2014. The Interplay of Friendship Networks and Social Networking Sites: Longitudinal Analysis of Selection and Influence Effects on Adolescent Smoking and Alcohol Use. *American journal of public health (1971)*, 104, e51-e59.
- HUNTER, R. F., MCANENEY, H., DAVIS, M., TULLY, M. A., VALENTE, T. W. & KEE, F. 2015. "Hidden" Social Networks in Behavior Change Interventions. *American journal of public health (1971)*, 105, 513-516.
- INCHLEY, J., CURRIE, D., YOUNG, T., SAMDAL, O., TORSHEIM, T., AUGUSTSON, L., MATHISON, F., ALEMAN-DIAZ, A., MOLCHO, M., WEBER, M. & BARNEKOW, V. 2016. Growing up unequal: gender and socioeconomic differences in young people's health and well-being. Health behaviour in school-aged children (HBSC) study: international report from the 2013/2014 survey. World Health Organisation.
- INCHLEY, J., MOKOGWU, D., MABELIS, J. & CURRIE, D. 2020. Health Behaviour in School-aged Children (HBSC) 2018 Survey in Scotland: National Report.
- KIRKE, D. M. 2004. Chain reactions in adolescents' cigarette, alcohol and drug use: similarity through peer influence or the patterning of ties in peer networks? *Social networks*, 26, 3-28.
- KNOX, H., SAVAGE, M. & HARVEY, P. 2006. Social networks and the study of relations: networks as method, metaphor and form. *Economy and society*, 35, 113-140.
- LAI, M. & LAW, N. 2006. Peer Scaffolding of Knowledge Building Through Collaborative Groups with Differential Learning Experiences. *Journal of educational computing research*, 35, 123-144.
- LAKON, C. M. & HIPPI, J. R. 2014. On Social and Cognitive Influences: Relating Adolescent Networks, Generalized Expectancies, and Adolescent Smoking. *PloS one*, 9, e115668-e115668.
- LAKON, C. M., HIPPI, J. R., WANG, C., BUTTS, C. T. & JOSE, R. 2015. Simulating Dynamic Network Models and Adolescent Smoking: The Impact of Varying Peer Influence and Peer Selection. *American journal of public health (1971)*, 105, 2438-2448.
- LATKIN, C. A., SHERMAN, S. & KNOWLTON, A. 2003. HIV Prevention Among Drug Users: Outcome of a Network-Oriented Peer Outreach Intervention. *Health psychology*, 22, 332-339.
- LAVERTY, A. A., FILIPPIDIS, F. T., TAYLOR-ROBINSON, D., MILLETT, C., BUSH, A. & HOPKINSON, N. S. 2019. Smoking uptake in UK children: analysis of the UK Millennium Cohort Study. *Thorax*, 74, 607-610.

- LAYZER, C., ROSAPEP, L. & BARR, S. 2017. Student Voices: Perspectives on Peer-to-Peer Sexual Health Education. *The Journal of school health*, 87, 513-523.
- LEATHERDALE, S. T. & MCDONALD, P. W. 2006. Are the recommended taxonomies for the stages of youth smoking onset consistent with youth's perceptions of their smoking status? *Canadian Journal of Public Health*, 97, 316-319.
- LEONARDI-BEE, J., JERE, M. L. & BRITTON, J. 2011. Exposure to parental and sibling smoking and the risk of smoking uptake in childhood and adolescence: a systematic review and meta-analysis.(Report). *Thorax*, 66, 847.
- LEVENTHAL, H. & CLEARY, P. D. 1980. The smoking problem: A review of the research and theory in behavioral risk modification. *Psychological Bulletin*, 88, 370-405.
- LEVIN, K. A., DUNDAS, R., MILLER, M. & MCCARTNEY, G. 2014. Socioeconomic and geographic inequalities in adolescent smoking: A multilevel cross-sectional study of 15 year olds in Scotland.(Author abstract). *Social Science & Medicine*, 107, 162.
- LORANT, V., ROJAS, V. S., ROBERT, P.-O., KINNUNEN, J. M., KUIPERS, M. A. G., MOOR, I., ROSCILLO, G., ALVES, J., RIMPELÄ, A., FEDERICO, B., RICHTER, M., PERELMAN, J. & KUNST, A. E. 2017. Social network and inequalities in smoking amongst school-aged adolescents in six European countries. *International journal of public health*, 62, 53-62.
- LORANT, V., SOTO, V. E., ALVES, J., FEDERICO, B., KINNUNEN, J., KUIPERS, M., MOOR, I., PERELMAN, J., RICHTER, M., RIMPELÄ, A., ROBERT, P.-O., ROSCILLO, G. & KUNST, A. 2015. Smoking in school-aged adolescents: design of a social network survey in six European countries. *BMC research notes*, 8, 91-91.
- LUKE, D. A. & HARRIS, J. K. 2007. Network Analysis in Public Health: History, Methods, and Applications. *Annual review of public health*, 28, 69-93.
- MACDONALD-WALLIS, K., JAGO, R. & STERNE, J. A. C. 2012. Social network analysis of childhood and youth physical activity: A systematic review. *American journal of preventive medicine*, 43, 636-642.
- MATURO, C. C. & CUNNINGHAM, S. A. 2013. Influence of Friends on Children's Physical Activity: A Review. *American journal of public health (1971)*, 103, e23-e38.
- MAULIK, P. K., EATON, W. W. & BRADSHAW, C. P. 2011. The Effect of Social Networks and Social Support on Mental Health Services Use, Following a Life Event, among the Baltimore Epidemiologic Catchment Area Cohort. *The journal of behavioral health services & research*, 38, 29-50.
- MAYHEW, K. P., FLAY, B. R. & MOTT, J. A. 2000. Stages in the development of adolescent smoking. *Drug and alcohol dependence*, 59 Suppl 1, S61.
- MERCKEN, L., SNIJDERS, T. A. B., STEGLICH, C. & DE VRIES, H. 2009. Dynamics of adolescent friendship networks and smoking behavior: Social network analyses in six European countries. *Social science & medicine (1982)*, 69, 1506-1514.
- MERCKEN, L., STEGLICH, C., SINCLAIR, P., HOLLIDAY, J. & MOORE, L. 2012. A Longitudinal Social Network Analysis of Peer Influence, Peer Selection, and Smoking Behavior Among Adolescents in British Schools. *Health Psychology*, 31, 450-459.
- MERMELSTEIN, R. 2008. Moving tobacco prevention outside the classroom. *The Lancet (British edition)*, 371, 1556-1557.
- METHLEY, A. M., CAMPBELL, S., CHEW-GRAHAM, C., MCNALLY, R. & CHERAGHI-SOHI, S. 2014. PICO, PICOS and SPIDER: a comparison study of specificity and sensitivity in three search tools for qualitative systematic reviews. 14, 579.
- MICHELL, L. & AMOS, A. 1997. Girls, pecking order and smoking. *Social Science & Medicine*, 44, 1861-1869.
- MILBURN, K. 1995. A critical review of peer education with young people with special reference to sexual health. *Health education research*, 10, 407-420.

- MOORE, G., AUDREY, S., BARKER, M., BOND, L., BONELL, C., COOPER, C., HARDEMAN, W., MOORE, L., O'CATHAIN, A., TINATI, T., WIGHT, D. & BAIRD, J. 2014. Process evaluation in complex public health intervention studies: the need for guidance. *Journal of Epidemiology and Community Health*, 68, 101.
- MOORE, G. F. & LITTLECOTT, H. J. 2015. School- and Family-Level Socioeconomic Status and Health Behaviors: Multilevel Analysis of a National Survey in Wales, United Kingdom. *The Journal of school health*, 85, 267-275.
- MOWERY, P. D., FARRELLY, M. C., HAVILAND, M. L., GABLE, J. M. & WELLS, H. E. 2004. Progression to established smoking among US youths. *The American Journal of Public Health*, 94, 331.
- MULLER, T. 2007. *Breaking the cycle of children's exposure to tobacco smoke*, London, London.
- MURLOW, C. D. 1994. Rationale For Systematic Reviews. *BMJ: British Medical Journal*, 597.
- NAGELHOUT, G. E., DE VRIES, H., BOUDREAU, C., ALLWRIGHT, S., MCNEILL, A., VAN DEN PUTTE, B., FONG, G. T. & WILLEMSSEN, M. C. 2012. Comparative impact of smoke-free legislation on smoking cessation in three European countries. *The European Journal of Public Health*, 22, 4-9.
- NICE. Smoking Prevention in Schools. Public Health Guideline PH23. 2010. Available <http://guidance.nice.org.uk/PH23> [Last accessed 3rd January 2021].
- NICE. Consideration of an update of the public health guidance on 'School based interventions to prevent smoking' (PH23) 2013. <https://www.nice.org.uk/guidance/ph23/evidence/review-decision-2013-546068269> [Last accessed 3rd January 2021].
- NICHTER, M., VUCKOVIC, N., QUINTERO, G. & RITENBAUGH, C. 1997. Smoking experimentation and initiation among adolescent girls: qualitative and quantitative findings. BMJ Publishing Group Ltd.
- NOYES, J., BOOTH, A., HARRIS, J., CARGO, M., FLEMMING, K., GARSIDE, R., HANNES, K., HARDEN, A., LEWIN, S., PANTOJA, T. & THOMAS, J. 2018. Cochrane Qualitative and Implementation Methods Group guidance series— paper 1: introduction. *Journal of Clinical Epidemiology*, 97, 35-38.
- ÖBERG, M., JAAKKOLA, M. S., WOODWARD, A., PERUGA, A. & PRÜSS-USTÜN, A. 2011. Worldwide burden of disease from exposure to second-hand smoke: a retrospective analysis of data from 192 countries. *The Lancet (British edition)*, 377, 139-146.
- OCHIENG, B. M. N. 2003. Adolescent health promotion: The value of being a peer leader in a health education/ promotion peer education programme. *Health education journal*, 62, 61-72.
- OFFICE FOR NATIONAL STATISTICS. 2013. General Lifestyle Survey: 2011. <https://www.ons.gov.uk/peoplepopulationandcommunity/personalandhouseholdfinances/incomeandwealth/compendium/generallifestylesurvey/2013-03-07> [last accessed 3rd January 2021]
- OKOLI, C. T. C., TORCHALLA, I., RATNER, P. A. & JOHNSON, J. L. 2011. Differences in the smoking identities of adolescent boys and girls. *Addictive Behaviors*, 36, 110-115.
- PAMPEL, F. C., MOLLBORN, S. & LAWRENCE, E. M. 2014. Life course transitions in early adulthood and SES disparities in tobacco use. *Social science research*, 43, 45-59.
- PARK, E. W., TUDIVER, F. G. & CAMPBELL, T. 2012. Enhancing partner support to improve smoking cessation. *Cochrane library*, 7, CD002928-CD002928.
- PEARSON, M. & MICHELL, L. 2000. Smoke Rings: social network analysis of friendship groups, smoking and drug-taking. *Drugs : education, prevention & policy*, 7, 21-37.

- PEARSON, M., SWEETING, H., WEST, P., YOUNG, R., GORDON, J. & TURNER, K. 2006. Adolescent substance use in different social and peer contexts: A social network analysis. *Drugs : education, prevention & policy*, 13, 519-536.
- PETTICREW, M. & ROBERTS, H. 2006. Systematic reviews in the social sciences : a practical guide. *Malden, MA; Oxford: Blackwell Pub.*
- PETTICREW, M. & ROBERTS, H. 2003. Evidence, Hierarchies, and Typologies: Horses for Courses. *Journal of Epidemiology and Community Health (1979-)*, 527.
- PLUMRIDGE, E. W., FITZGERALD, L. J. & ABEL, G. M. 2002. Performing coolness: smoking refusal and adolescent identities. *Health Education Research*, 17, 167-179.
- POPAY, J. M., S 2010. Qualitative research review and synthesis. in I Bourgeault, R Dingwall & RG de Vries (eds), *The Sage handbook of qualitative methods in health research*. Sage, London, pp. 289-306.
- PUNCH, S. 2002. Research with Children: The Same or Different from Research with Adults? *Childhood*, 9, 321-341.
- PUTNAM, R. D. 1995. Bowling Alone: America's Declining Social Capital. *Journal of democracy*, 6, 65-78.
- PUTNAM, R. D. 2000. *Bowling alone : the collapse and revival of American community*, New York ; London, New York ; London : Simon & Schuster.
- RAGAN, D. T. 2016. Peer beliefs and smoking in adolescence: a longitudinal social network analysis. *The American journal of drug and alcohol abuse*, 42, 222-230.
- REIDPATH, D. D., DAVEY, T. M., KADIRVELU, A., SOYIRI, I. N. & ALLOTEY, P. 2014. Does one cigarette make an adolescent smoker, and is it influenced by age and age of smoking initiation? Evidence of association from the U.S. Youth Risk Behavior Surveillance System (2011). *Preventive Medicine*, 59, 37-41.
- REITH, G. & DOBBIE, F. 2011. Beginning gambling: The role of social networks and environment. *Addiction research & theory*, 19, 483-493.
- REITH, G. & DOBBIE, F. 2013. Gambling careers: A longitudinal, qualitative study of gambling behaviour. *Addiction Research & Theory*, 21, 376-390.
- RITCHIE, J., LEWIS, J., MCNAUGHTON NICHOLLS, C. & ORMSTON, R. 2014. *Qualitative research practice : a guide for social science students and researchers*, Los Angeles, Los Angeles : SAGE.
- ROBERTS, C., FREEMAN, J., SAMDAL, O., SCHNOHR, C. W., DE LOOZE, M. E., NIC GABHAINN, S., IANNOTTI, R. & RASMUSSEN, M. 2009. The health behaviour in school-aged children (hbsc) study: methodological developments and current tensions. 54.
- ROBINS, G. 2015. *Doing social network research : network-based research design for social scientists*, London, London : SAGE Publications Ltd.
- ROGERS, E. M. 2003. *Diffusion of innovations*, Riverside, New York, Riverside: Free Press.
- ROVNIAK, L. S., KONG, L., HOVELL, M. F., DING, D., SALLIS, J. F., RAY, C. A., KRASCHNEWSKI, J. L., MATTHEWS, S. A., KISER, E., CHINCHILLI, V. M., GEORGE, D. R. & SCIAMANNA, C. N. 2016. Engineering Online and In-Person Social Networks for Physical Activity: A Randomized Trial. *Annals of behavioral medicine*, 50, 885-897.
- ROWA-DEWAR, N., AMOS, A. & CUNNINGHAM-BURLEY, S. 2014. Children's resistance to parents' smoking in the home and car: a qualitative study. *Addiction.*, 109, 645-652.
- RUITER, R. A. C., KESSELS, L. T. E., PETERS, G. J. Y. & KOK, G. 2014. Sixty years of fear appeal research: current state of the evidence. *International journal of psychology*, 49, 63-70.
- RYAN, L. 2011a. Migrants' Social Networks and Weak Ties: Accessing Resources and Constructing Relationships Post-Migration. *The Sociological Review*, 59, 707-724.

- RYAN, L., MULHOLLAND, J. & AGOSTON, A. 2014. Talking Ties: Reflecting on Network Visualisation and Qualitative Interviewing. *Sociological Research Online*, 19, 1-12.
- SAMUELSSON, M., THERNLUND, G. & RINGSTRÖM, J. 2016. Using the Five Field Map to Describe the Social Network of Children: A Methodological Study. *International journal of behavioral development*, 19, 327-345.
- SAWKA, K., MCCORMACK, G. R., NETTEL-AGUIRRE, A., HAWES, P. & DOYLE-BAKER, P. K. 2013. Friendship networks and physical activity and sedentary behavior among youth: a systematized review. *The international journal of behavioral nutrition and physical activity*, 10, 130-130.
- SCOTT, J. 2013. *Social network analysis*, Los Angeles, Calif. ; London, Los Angeles, Calif. ; London : SAGE.
- SCOTTISH GOVERNMENT. 2013. Creating a tobacco-free generation; A Tobacco Control Strategy for Scotland. APS Group.
- SCOTTISH GOVERNMENT. 2017. A Process Evaluation of the Implementation of ASSIST in Scotland. APS Group.
- SCOTTISH GOVERNMENT. 2018a. Raising Scotland's Tobacco-free Generation Our Tobacco Control Action Plan 2018. APS Group.
- SCOTTISH GOVERNMENT. 2018b. The Scottish Health Survey 2017 Volume 1: Main Report. APS Group.
- SCOTTISH GOVERNMENT. 2019b. Scottish Schools Adolescent Lifestyle and Substance Use Survey (SALSUS) Technical Report (2018). APS Group.
- SCOTTISH GOVERNMENT. 2019c. The Scottish Health Survey 2018 edition. Volume 1. Main report. APS Group.
- SEBIRE, S. J., EDWARDS, M. J., CAMPBELL, R., JAGO, R., KIPPING, R., BANFIELD, K., TOMKINSON, K., GARFIELD, K., LYONS, R. A., SIMON, J., BLAIR, P. S. & HOLLINGWORTH, W. 2016. Protocol for a feasibility cluster randomised controlled trial of a peer-led school-based intervention to increase the physical activity of adolescent girls (PLAN-A). *Pilot and feasibility studies*, 2, 2-2.
- SEO, D.-C. & HUANG, Y. 2012. Systematic Review of Social Network Analysis in Adolescent Cigarette Smoking Behavior. *The Journal of school health*, 82, 21-27.
- SILVERMAN, D. 2014. *Interpreting qualitative data*, Los Angeles, Los Angeles : SAGE.
- SILVERMAN, D. 2016. *Qualitative research*, London, London : Sage Publications.
- SIMONS-MORTON, B., CRUMP, A. D., HAYNIE, D. L., SAYLOR, K. E., EITEL, P. & YU, K. 1999. Psychosocial, School, and Parent Factors Associated with Recent Smoking among Early-Adolescent Boys and Girls. *Preventive medicine*, 28, 138-148.
- SIMONS-MORTON, B., HAYNIE, D. L., CRUMP, A. D., EITEL, P. & SAYLOR, K. E. 2001. Peer and Parent Influences on Smoking and Drinking among Early Adolescents. *Health education & behavior*, 28, 95-107.
- SMALL, S. P., KUSHNER, K. E. & NEUFELD, A. 2013. Smoking Prevention Among Youth: A Multipronged Approach Involving Parents, Schools, and Society. Canada: MCGILL UNIVERSITY - SCHOOL OF NURSING.
- STARKEY, F., AUDREY, S., HOLLIDAY, J., MOORE, L. & CAMPBELL, R. 2009. Identifying influential young people to undertake effective peer-led health promotion: the example of A Stop Smoking In Schools Trial (ASSIST). *Health education research*, 24, 977-988.
- TEGLICH, C., SINCLAIR, P., HOLLIDAY, J. & MOORE, L. 2012. Actor-based analysis of peer influence in A Stop Smoking In Schools Trial (ASSIST). *Social networks*, 34, 359-369.
- STERBA, K. R., RABIUS, V., CARPENTER, M. J., VILLARS, P., WIATREK, D. & MCALISTER, A. 2011. Dyadic Efficacy for Smoking Cessation: Preliminary Assessment of a New Instrument. *Nicotine & tobacco research*, 13, 194-201.

- THAKUR, J. S., NARAIN, J. P., GARG, R. & MENABDE, N. 2011. Tobacco use: A major risk factor for non communicable diseases in South-East Asia region. *Indian journal of public health*, 55, 155-160.
- THOMAS, J. & BARNETT-PAGE, E. 2009. Methods for the synthesis of qualitative research: a critical review. *BMC Medical Research Methodology*, Vol 9, Iss 1, p 59 (2009), 59.
- THOMAS J, H. A., NEWMAN M 2012. Synthesis: Combining results systematically and appropriately. In Gough, D, Oliver, S, Thomas, J (2012) An Introduction to Systematic Reviews. London: Sage Publications Ltd, pages 179-227. ISBN: 9781849201810.
- THOMAS, R. E., BAKER, P. & LORENZETTI, D. 2007. Family-based programmes for preventing smoking by children and adolescents. *Cochrane database of systematic reviews*, CD004493-CD004493.
- THOMAS, R. E., MCLELLAN, J. & PERERA, R. 2013b. School-based programmes for preventing smoking. *Cochrane library*, 2013, CD001293-CD001293.
- THUN, M., PETO, R., BOREHAM, J. & LOPEZ, A. D. 2012. Stages of the cigarette epidemic on entering its second century. *Tobacco control*, 21, 96-101.
- TISDALL, E. K. M., DAVIS, J. E. & GALLAGHER, M. 2008. *Researching with Children and Young People: Research Design, Methods and Analysis*, London, London: SAGE Publications.
- TONG, A., FLEMMING, K., MCINNES, E., OLIVER, S. & CRAIG, J. 2012. Enhancing transparency in reporting the synthesis of qualitative research: ENTREQ. 12, 181-181.
- TUBARO, P., RYAN, L. & ANGELO, A. 2016a. The Visual Sociogram in Qualitative and Mixed-Methods Research. *Sociological research online*, 21, 180-197.
- TURNER, K., WEST, P., GORDON, J., YOUNG, R. & SWEETING, H. 2006. Could the peer group explain school differences in pupil smoking rates? An exploratory study. *Social science & medicine* (1982), 62, 2513-2525.
- TURNER-WALLER, M. 1992. Smoking and the Young: A report of a working party of the Royal College of Physicians. *Tobacco control*, 1, 231-235.
- TYAS, S. L. & PEDERSON, L. L. 1998. Psychosocial factors related to adolescent smoking: a critical review of the literature. BMJ Publishing Group Ltd.
- UK PARLIAMENT DEPARTMENT OF HEALTH. 1998. Smoking kills. A white paper on tobacco. TSO.
- UMBERSON, D. & KARAS MONTEZ, J. 2010. Social Relationships and Health: A Flashpoint for Health Policy. *Journal of health and social behavior*, 51, S54-S66.
- VALENTE, T. W. 2010. *Social Networks and Health: Models, Methods, and Applications*, New York, New York: Oxford University Press USA - OSO.
- VALENTE, T. W. 2012. Network Interventions. *Science (American Association for the Advancement of Science)*, 337, 49-53.
- VALENTE, T. W. & PUMPUANG, P. 2006. Identifying Opinion Leaders to Promote Behavior Change. *Health education & behavior*, 34, 881-896.
- VYGOTSKI, L. S. 1978. *Mind in society the development of higher psychological processes*, Cambridge, Mass. ; London, Cambridge, Mass. ; London : Harvard University Press.
- WASS, R., HARLAND, T. & MERCER, A. 2011. Scaffolding critical thinking in the zone of proximal development. *Higher education research and development*, 30, 317-328.
- WASSERMAN, S. 1994. *Social network analysis : methods and applications*, Cambridge, Cambridge : Cambridge University Press.
- WEST, P. 1997. Health inequalities in the early years: Is there equalisation in youth? *Social Science & Medicine*, 44, 833-858.
- WHITE, J., HAWKINS, J., MADDEN, K., GRANT, A., ER, V., ANGEL, L., PICKLES, T., KELSON, M., FLETCHER, A., MURPHY, S., MIDGLEY, L., ECCLES, G., COX, G., HOLLINGWORTH, W., CAMPBELL, R., HICKMAN, M., BONELL, C. &

- MOORE, L. 2017. Adapting the ASSIST model of informal peer-led intervention delivery to the Talk to FRANK drug prevention programme in UK secondary schools (ASSIST + FRANK): intervention development, refinement and a pilot cluster randomised controlled trial. *Public health research (Southampton, England)*, 5, 1-98.
- WHITE, J., HOLLIDAY, J., DANIEL, R., CAMPBELL, R. & MOORE, L. 2019. Diffusion of effects of the ASSIST school-based smoking prevention intervention to non-participating family members: a secondary analysis of a randomized controlled trial. *Addiction (Abingdon, England)*, 115, 986-991.
- WHO 2012. Health Behaviour in School-aged Children (HSBC) Study: International Report from the 2009/2010 Survey Health Policy for Children and Adolescents, No. 6. Center for Tobacco Control Research and Education, UC San Francisco.
- WHO 2019. WHO report on the global tobacco epidemic 2019: Offer help to quit tobacco use.
- WIEHE, S. E., GARRISON, M. M., CHRISTAKIS, D. A., EBEL, B. E. & RIVARA, F. P. 2005. A systematic review of school-based smoking prevention trials with long-term follow-up. *Journal of adolescent health*, 36, 162-169.
- WILTSHIRE, S., AMOS, A., HAW, S. & MCNEILL, A. 2005. Image, context and transition: smoking in mid-to-late adolescence. *Journal of Adolescence*, 28, 603-617.
- WINTHER, A., DENNISON, E., AHMED, L. A., FURBERG, A.-S., GRIMNES, G., JORDE, R., GJESDAL, C. G. & EMAUS, N. 2014. The Tromsø Study: Fit Futures: a study of Norwegian adolescents' lifestyle and bone health. *Archives of osteoporosis*, 9, 1-11.
- WIPFLI, H. 2012. The Tobacco Atlas, Fourth Edition. *American journal of epidemiology*, 176, 1193-1193.
- WOLFENDEN, L., NATHAN, N. K., SUTHERLAND, R., YOONG, S. L., HODDER, R. K., WYSE, R. J., DELANEY, T., GRADY, A., FIELDING, A., TZELEPIS, F., CLINTON-MCHARG, T., PARMENTER, B., BUTLER, P., WIGGERS, J., BAUMAN, A., MILAT, A., BOOTH, D. & WILLIAMS, C. M. 2017. Strategies for enhancing the implementation of school-based policies or practices targeting risk factors for chronic disease. *Cochrane library*, 2017, CD011677-CD011677.