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Recruiting Opinion Leaders for the United Kingdom ASSIST Programme

Jo Holliday, Suzanne Audrey, Rona Campbell, and Laurence Moore

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Summary and Keywords

Addictive behaviors with detrimental outcomes can quickly become embedded in daily life. It therefore remains a priority to prevent or modify these health behaviors early in the life course. Diffusion theory suggests that community norms are shaped by credible and influential “opinion leaders” who may be characterized by their values and traits, competence or expertise, and social position. With respect to health behaviors, opinion leaders can assume a variety of roles, including changing social norms and facilitating behavioral change. There is considerable variation in the methods used to identify opinion leaders for behavior change interventions, and these may have differential success. However, despite the potential consequences for intervention success, few studies have documented the processes for identifying, recruiting, and training opinion leaders to promote health, or have discussed the characteristics of those identified.

One study that has acknowledged this is the effective UK-based ASSIST smoking-prevention program. The ASSIST Programme is an example of a peer-led intervention that has been shown to be successful in utilizing opinion leaders to influence health behaviors in schools. A “whole community” peer nomination process to identify opinion leaders underwent extensive developmental and piloting work prior to being administered in a randomized trial context. Influential students were identified through the use of three simple questions and trained as “peer supporters” to disseminate smoke-free messages through everyday conversations with their peers. In response to a need to understand the contribution of various elements of the intervention, and the degree to which these achieve their aim, a comprehensive assessment of the nomination process was conducted following intervention implementation.

The nomination process was successful in identifying a diverse group of young people who represented a variety of social groups, and whom were predominantly considered suitable by their peers. The successful outcome of this approach demonstrates the importance of paying close attention to the design and development of strategies to identify opinion leaders. Importantly, the involvement of young people during the development phase may be key to increasing the effectiveness of peer education that relies on young people taking the lead role.

Keywords: peer education, health behavior, prevention, adolescents, diffusion of innovation, intervention

Using Adolescent Opinion Leaders to Address Health

Poor health and well-being can be caused by risk behaviors such as smoking, drinking, illicit substance use, poor diet, and unsafe sexual behavior. These risk behaviors may be established during adolescence, and maintained through into adulthood. The focus of much research into such risk behaviors is therefore on how to predict and prevent their uptake with the aim of improving life expectancy and quality of life. Research has shown that the factors influencing adolescents' risk-taking behaviors are complex and span a number of spheres of influence including economic, social, inter- and intrapersonal, and involve peers, family, school, and the wider community.

Peer education approaches that rely on young people taking a lead role have proved a popular way of addressing adolescent health behavior, and a number of interventions have shown promise (Mellanby, Rees, & Tripp, 2000). These are frequently delivered in the school setting where young people are a captive audience. This approach may reduce concerns about "out-of touch" authority figures providing health-related information to a younger generation. Nevertheless, within this context peer education is often guided by school staff and assumes a formal approach in which young people are expected to become "mini teachers." This can undermine an important rationale of peer education: that it harnesses naturally occurring interaction and information sharing (Frankham, 1998). As an alternative, informal approaches grounded in diffusion theory emphasize everyday social interaction (Backett-Milburn & Wilson, 2000) and capitalize on the transfer of information during informal contacts made between peer educators ("Opinion Leaders") and their peers (Orme & Starkey, 1999). Despite this recognition, little work has been carried out in relation to using adolescent opinion leaders in the fields of health or peer education.

Several studies have assessed the perceived suitability of young people identified for peer education projects. For example, Klepp, Halper, and Perry (1986) reported that 70% of students (88% of whom were peer leaders themselves) who identified peer leaders for a smoking prevention program would have nominated the same peer leaders if they had known the role they would be asked to undertake at the time of election. Klepp and colleagues (1986) also observed in an eating and physical activity program, that 100% of peer leaders and 82% of participating students saw the procedures as fair. However, those students who raised reservations felt the identification process was a "popularity contest." Another study by Kratzer and Lettl (2009) assessed the social position of adolescent opinion leaders and concluded that they tended to be positioned within clusters and had many direct ties.

The paucity of research examining the nomination of adolescent peer educators and opinion leaders in the field of adolescent health is a concern, particularly since assumptions may be made that adult models can be applied to adolescent interventions. One study that recognized this was the effective UK-based ASSIST smoking prevention program, which comprehensively documented the development, implementation, and outcome of a nomination process used to identify opinion leaders for an informal peer education initiative (Audrey, Cordall, Moore, Cohen, & Campbell, 2004; Campbell et al., 2008; Holliday, 2006; Holliday, Audrey, Campbell, & Moore, 2016; Starkey, Audrey, Holliday, Moore, & Campbell, 2009).

The ASSIST Programme

The ASSIST Programme (which is described in detail by Audrey et al., 2004) is an informal school-based, peer-led intervention aimed at reducing the uptake of regular (weekly) smoking among Year 8 students (12 to 13 year olds). The program, which aims to spread new norms of non-smoking behavior, relies on peer socialization and the diffusion of smoke-free messages by “peer supporters” to other students in their school year.

The program was found to be effective in a randomized controlled trial (Campbell et al., 2008). Primary outcomes measures were smoking in the past week in both the school year group and in a group at high risk of regular smoking uptake, which was identified at baseline as occasional, experimental, or ex-smokers. The adjusted odds ratio of being a smoker in intervention compared with control schools was 0.75 (95% CI 0.55–1.01) immediately after intervention delivery (n=9349 students), 0.77 (0.59–0.99) at 1-year follow-up (n=9147), and 0.85 (0.72–1.01) at 2-year follow-up (n=8756) (See Table 1). This suggests an attenuation of intervention effect over time. The corresponding odds ratios for the high-risk group were 0.79 (0.55–1.13 [n=3561]), 0.75 (0.56–0.99 [n=3483]), and 0.85 (0.70–1.02 [n=3294]), respectively. The primary analysis comprised a three-tier multilevel model with data from all three follow-ups, results from which demonstrated a 22% reduction (odds ratio 0.78 [95% CI 0.64–0.96]) in the odds of being a regular smoker in an intervention school compared with a control school (Campbell et al., 2008).

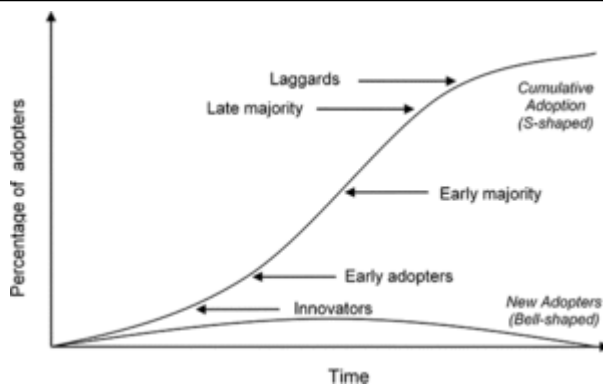
Table 1. Adjusted odds ratios of smoking in the past week at each follow-up									
	Immediately after intervention			1-year follow-up			2-year follow-up		
	N	OR (95% CI)	p-value	N	OR (95% CI)	p-value	N	OR (95% CI)	p-value
Adjusted odds ratio									
All students	9349	0.75 (0.55–1.01)	0.058	9147	0.77 (0.59–0.99)	0.043	8756	0.85 (0.72–1.01)	0.067
Occasional, experimental, and ex-smokers	3561	0.79 (0.55–1.13)	0.189	3483	0.75 (0.56–0.99)	0.046	3294	0.85 (0.70–1.02)	0.087

If implemented at a population level, the ASSIST Programme could effect a reduction in adolescent smoking prevalence of public health importance. As a consequence of these findings, the program is now licensed and delivered by public health providers in the UK and delivery of the program has recently commenced in France (see <http://www.decipher-impact.com/>).

Diffusion Theory

Diffusion theory (Rogers, 2003) explains the spread of innovations within a population. Diffusion is the process by which an innovation spreads through communication channels over time among members of a social system. At the heart of the diffusion process is the modeling and imitation of innovations already adopted or endorsed by credible and influential “Opinion Leaders” within a population (Rogers, 2003; Weimann, 1994). There are several key elements in the diffusion of innovations: the innovation, communication channels, time, and the social system (Rogers, 2003). An *innovation* is an idea, practice, or object that individuals within a social system perceive as new. *Communication* is the process by which members of a population communicate new ideas to others in a social system. In the early years of diffusion research, this was largely interpersonal communication, but in recent times this has extended to other communication channels such as telephone, email, virtual communication technologies, social media, blogs, online forums, and recommendation systems. Diffusion occurs over *time*; innovations are rarely adopted by an individual, or within a social system instantly. A *social system* is a set of interconnected members (including *opinion leaders* and *adopters*) who are subject to a variety of internal and external influences. Internal influences include the relationships and social structures that exist within the system whereas external influences include, but are not limited to, media exposure and laws.

Diffusion theory posits that the adoption of practices and ideas traditionally follows an “S”-shaped curve, with slow uptake at the start, followed by a period of rapid uptake, and a decrease in rate at the end of the adoption period (see Figure 1).



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Figure 1. Traditional "S"-shaped diffusion curve

Different members of a social system adopt an innovation throughout the adoption period (see Table 2). The first to adopt are "innovators" who comprise a very small proportion of the population. These members are probably the more "radical" in the community and therefore have little impact on

further diffusion. The next to adopt are the "early adopters." This group includes "opinion leaders" who have the most influence in communicating the innovation throughout the population. Following these are the "early majority," the "late majority," and finally, the "laggards." As more members of the community adopt the innovation, the rate at which adoption occurs slows, characterizing the "S"-shaped curve. It should be noted that diffusion theory can also be applied to the discontinuation of a practice.

Table 2. Major Adopter categories

Adopter category	Proportion of population (%)	Adopter characteristics
Innovator	2.5	Eager but "radical"; probably mistrusted by safe majority
Early adopter	13.5	Respectable but amenable to change; good candidate for opinion leader
Early majority	34	Unlikely to be the first nor the last to try a new innovation
Late majority	34	Reluctant to change until benefits have been proven
Laggards	16	Diehard conservatives, including a subgroup who will never change and appear to be against everything most of the time

Source: Rogers (2003) and Rogers and Shoemaker (1971).

The innovation-decision process is not a simple progression from non-adopter, to adopter status (Rogers, 2003). It involves individuals passing through five stages.

1. *Knowledge*: when an individual is exposed to an innovation and becomes aware of its existence and function.
2. *Persuasion*: when an individual forms an attitude toward the innovation.
3. *Decision*: when an individual engages in activities that result in a decision to adopt or reject the innovation.
4. *Implementation*: when an individual utilizes the innovation.
5. *Confirmation*: when an individual seeks to reinforce or reverse this decision.

While diffusion of innovation theory is a useful framework to describe the adoption or discontinuation of a new idea, the concept has been much critiqued by researchers from a wide variety of research areas ranging from agricultural research to organizational research and the adoption of software engineering inventions. Some of the main criticisms are categorized by Rogers (2003) and include the following: pro-innovation bias, individual-blame bias, recall problem, and issues of equality.

Pro-innovation bias implies that all innovations will be viewed as positive and will be diffused quickly to and adopted by all members of the social system. This is not always the case and it is possible that proponents of an innovation have overestimated its benefits and underestimated its negative consequences. This can be overcome by taking a more objective attitude towards the innovation.

Individual-blame bias is the tendency to blame individuals for their non-adoption of an innovation. Instead, diffusion researchers should acknowledge that characteristics of the innovation or the social system might affect adoption. For example, the innovation may not be easily accessible or may be outside the financial limits of potential adopters. Equally, the innovation may be viewed as incompatible with the societal beliefs or norms.

Given the importance of time for diffusion research, *the recall problem* relates to an individual's ability to accurately recall when they adopted a new idea leading to data inaccuracies. This can be overcome by gathering data throughout the diffusion process rather than waiting until the end of the process.

Diffusion of new ideas cause *issues of equality* by widening the socioeconomic gap between among members of the social system.

Opinion Leaders: Theoretical and Historical Underpinnings

The roots of diffusion theory are grounded in early social science. The ideas of French lawyer, judge, and sociologist Gabriel Tarde, published in his influential book, *The Laws of Imitation* (Tarde, 1903) later evolved into diffusion theory. The landmark diffusion study was Ryan and Gross's (1943) agricultural study that assessed adoption of hybrid seed corn among Iowa farmers, and provided the framework for the diffusion model. In the public health field, Coleman, Katz, and Menzel (1957) studied the diffusion of the antibiotic drug tetracycline among doctors in Illinois.

Since 1960 there has been a proliferation of diffusion studies across the social sciences. Diffusion theory has been applied across several research traditions, including anthropology, geography, education, and public health. Examples include the diffusion of modern mathematics in Pittsburgh (Carlson, 1965); STOP AIDS in San Francisco (Wohlfeiler, 1998), and variations of this in developing countries (Singhal & Rogers, 2003) and the Midwestern United States of America (Stevenson, 1995); the diffusion of news of the September 11th terrorist attacks (Rogers & Siedel, 2002); increasing the rate of adoption of family planning methods (Berelson & Freedman, 1964; Boulay, Storey, & Sood, 2002), the diffusion of reproductive health campaigns (Valente & Saba, 2001), and the dissemination of public health knowledge (Lang et al., 2006).

In recent decades, the landscape of communication has seen traditional forms of interpersonal communication and print media supplemented by virtual communication platforms. Web-based influence can be significant. For example, bloggers have been seen to gain high levels of popularity and potential influence, and social media outlets can provide an effective vehicle through which to spread news and new ideas. These changes have prompted researchers to look at issues such as the role of online opinion leaders (e.g., van Eck, Jager, & Leeftang, 2011), how virtual opinion leaders can be identified (e.g., Dubois & Gaffney, 2014), and whether online diffusion networks can be utilized for positive ends (e.g., Cobb, Jacobs, Wileyto, Valente, & Graham, 2016; Ko et al., 2013).

As previously noted, research into diffusion networks and opinion leaders among children and young people is scarce. The following discussion about opinion leaders thus focuses on work relating to adults as a precursor to discussion of a case in which adolescents were recruited to be trained as opinion leaders for a peer education program.

In the public health field, opinion leaders have several roles in facilitating behavior change.

First, they provide entrée and legitimize behavior change programs. Second, they provide communication from their communities back to agencies that implement programs. Third, they can act as role models for behavior change within the community. Fourth, they can be the conveyors of health messages. Finally, they may act as the “capital” left after the agency has withdrawn from the community or organization thus institutionalizing program goals.

(Valente, 2010, p. 197)

Opinion leaders have distinct characteristics that allow them to influence other people. Different contexts (domains, cultures, societies) require and result in opinion leaders with different characteristics, and who are suited to different opinion leadership roles. For example, opinion leaders in the political arena will differ from those in the fashion or public health arenas. While profiling opinion leaders is almost impossible across these contexts, there are some similarities in their key attributes (Weimann, 1994). In the 1950s, Elihu Katz identified three areas of importance, noting that opinion leadership comprises (1) the leader’s values and traits (who one is); (2) the leader’s competence or expertise (what one knows); and (3) the leader’s social position (who one knows) (Katz, 1957).

An opinion leader’s values and traits that qualify them to undertake the role include characteristics such as innovativeness, risk preference, credibility, self-confidence, trust from others, and intelligence. Opinion leaders are generally more innovative than other members of the population (Becker, 1970; Rogers, 2003). However, they also need to reflect local norms in order to provide a realistic model for the target population, and to retain their influential position. Thus while they may be willing to handle the consequences of being different, they are unlikely to adopt a new innovation too far ahead of the rest of the group for fear of diverging too far from existing system norms and values (Weimann, 1994). Instead, they use their influence once they feel certain of an innovation’s advantage (Valente & Pumpuang, 2007). Opinion leaders are socially recognized as reliable sources of advice and guidance—this stems from the credibility, trustworthiness, and confidence derived from close personal contact between opinion leaders and their followers (Weimann, 1994). It is probable that an opinion leader’s ability to control the message they deliver, and the method of dissemination, may help them to retain credibility with the target population (Valente & Pumpuang, 2007).

While some correlations have been found between intelligence and opinion leadership (see, e.g., Simonton, 1985), Weimann (1994) suggests that divergent levels of intelligence may prove a barrier to influence. This relates to the notion that communication and therefore diffusion tend to occur along social gradients (Valente, 2010; Weimann, 1994), that is, between individuals who “*share common meanings, beliefs, and mutual understandings*” (Rogers, 2003, p. 306). Consequently, “*similarity facilitates common language, considerations, interests, values and evaluations*” (Weimann, 1994, p. 73) and promotes personal influence. Nevertheless, opinion leaders require a high level of

expertise and knowledge in specific areas which they gain from being actively involved with, or taking great interest in, related activities (Weimann, 1994). As well as providing opinion, they are also more likely to seek information and opinion from others (Katz, 1957; Nisbet, 2006; Weimann, 1994).

Opinion leaders are socially accessible, socially active, and have extensive interpersonal networks (Katz, 1957; Nisbet, 2006; Rogers, 2003; Rogers & Cartano, 1962; Weimann, 1994). In particular, they have many personal contacts and belong to many social groups (Katz, 1957; Nisbet, 2006; Weimann, 1994). However, given that similarity fosters communication, and it can be assumed that people who are close contacts would be held in higher regard than others, it is unlikely that credible opinion leaders from within one sector of the population will be credible opinion leaders for others (Katz, 1957). The influence of any one opinion leader may therefore be seen locally rather than across the network, limiting their ability to effect behavioral change among the whole community and supporting the idea that opinion leaders should be identified from across all sectors of the target community (Katz, 1957; Valente, 2010).

Identifying Opinion Leaders for Behavior Change

A critical objective of the diffusion model is to identify and recruit effective opinion leaders from within the target population. A review of 10 techniques used to identify opinion leaders to promote behavior change identified considerable variation in the methods used (Valente & Pumpuang, 2007). These include recruiting celebrities; recruiting volunteers (self-selection); using community leaders to identify opinion leaders (staff selection); identifying people who occupy leadership positions (positional approach); using knowledgeable community members to identify leaders (judges' ratings); using trained ethnographers to study the community and identify leaders (expert identification); asking index cases to select opinion leaders who in turn nominate others (snowball method); and sociometric methods where all or some community members nominate influential others. Sociometric methods may also use social network analysis to identify individuals with particular network characteristics in order to, for example, target community members based in network position (Valente & Fosados, 2006) or match opinion leaders with their immediate peer group (Valente & Davis, 1999; Wiist & Snider, 1991). Valente and Pumpuang (2007) noted that "whole community" methods (or approaches encompassing these methods) *"may provide the most valid and reliable means for identifying opinion leaders but they may also be the most costly and restrictive"* (p. 888).

Different methods vary in their capacity to identify opinion leaders with the characteristics highlighted by Katz (1957), and these methods can be used to identify opinion leaders who may be suitable for different roles (Goldenberg, Lehmann, Shidlovski, & Barak, 2006; Locock, Dopson, Chambers, & Gabbay, 2001). The choice of method is therefore crucial to the success of peer-led behavior change initiatives. The suitability of opinion leaders may relate to program theory, or particular characteristics needed in their role. For example, sociometric methods may identify well-connected opinion leaders, whereas self-identification may provide a better measure of personal values and traits (Valente & Pumpuang, 2007). However, choice of method often depends on available resources, or constraints imposed by the setting in which opinion leaders operate. This may result in the use of methods that identify peer educators who are not considered influential or credible (Valente & Davis, 1999; Valente & Pumpuang, 2007). Many peer education interventions adopt simple and inexpensive identification methods such as self-selection (Stephenson et al., 2004), staff selection (Phelps, Mellanby, Crichton, & Tripp, 1994), or a combination of the two (Harrin, 1997) suggesting that this may be the case in diffusion interventions delivered within this field. Of 191 opinion leader interventions categorized by Valente and Pumpuang (2007), many more (19%) used sociometric methods than is the case in peer education initiatives, while others used methods that may be more frequently used in peer education interventions; 13% used self-selection, 12% used

the positional approach, and 11.5% used judges' ratings (which could be considered similar to selection by staff).

Methods used to identify opinion leaders are often generic and applied across various settings and populations albeit with minor modifications for different topics or populations. For example, Fenton and Leggett (1971) applied questions developed by Rogers and Cartano (1962) by replacing the words "agricultural" with "public affairs." However, it may be naïve to assume that methods developed for use among any one population can be easily applied to a different population, or in a different setting, with similar results. Given these concerns, and the relative popularity of using opinion leaders for behavior change interventions, it is surprising that few studies discuss in detail their recruitment and selection strategies, or whether their methods succeeded in identifying individuals who have the characteristics required for the intended role. Equally, few studies compare the outcome of different identification methods.

Evaluating Methods to Identify Opinion Leaders

A comprehensive evaluation of whether a particular method has successfully identified opinion leaders is likely to include sociometric methods and/or methods to obtain the views of opinion leaders and other community members. The choice of methods used will probably be driven by the manner in which the opinion leaders of interest operate and the community that they are influencing. For example, measuring social networks may be more important for opinion leaders who rely on direct communication than for those who do not (for example, celebrities). Social network analysis is the most comprehensive way of assessing the structural elements of opinion leadership and can be used to assess the degree to which individuals are well connected and adopt strategic positions within their networks. For example, centrality (Freeman, 1978/1979) reflects importance based on position within one's network and has been suggested as an appropriate measure of opinion leadership (Valente, 2010). Assessing the degree to which social groups are represented by opinion leaders can also provide an indication of whether they are in a position to influence behavioral change within those groups and across a community. Surveys or qualitative methods such as interviews are likely to be the most appropriate to obtain perceptions of opinion leader influence (characteristics, competence, etc).

A number of studies in the fields of marketing and sociology have assessed the validity of alternative measures used to identify opinion leaders (Iyengar, Van den Bulte, & Valente, 2011; Jacoby, 1974; Rogers & Cartano, 1962; Weimann, 1991). These studies report some overlap in the outcome of methods; some opinion leaders identified using one method would also have been identified using another method.

Recruiting Opinion Leaders for the United Kingdom ASSIST Programme

The ASSIST Programme applied a rigorous approach to selecting opinion leaders, one that may be utilized by others seeking to adopt a whole community approach to identifying peer supporters.

The ASSIST Programme Approach to Selecting and Training Opinion Leaders

The ASSIST Programme utilized a whole community approach to identifying opinion leaders, with the community being defined as a single school year group (12- to 13-year-old students). The nomination process underwent extensive development and piloting to ensure that it was meaningful to the students involved (Starkey et al., 2009). Pre-piloting work conducted in two schools presented a list of potential questions to young people who were asked to identify the four questions they felt were most appropriate to identify influential young people in their year group, identify words they would not use, and identify alternatives. They were then asked to nominate fellow students using the questions selected and give their reasons for the nominations. This was to identify the kinds of qualities young people associated with each question. Neither smoking nor other aspects of opinion leadership were mentioned at this stage. Five questions identified through this process were further tested in the trial pilot study that took place in three schools. Questions were finalized by assessing whether responses were provided for each question, whether both girls and boys were identified, and by assessing whether some questions covered nominations from others. This analysis showed that only three questions were required and that it was necessary to include “in Year 8 at your school” in each question to avoid students nominating other people outside their school year group. It was also decided that the number of nominations should be limited to five to avoid students writing long lists of friends. A dummy question about which Year 8 students they had spoken to that day was also included to reduce the tendency of respondents to associate the process with popularity.

In the final recruitment process all students in Year 8 were asked to name up to five students in response to the following questions: “Who do you respect in Year 8 at your school?”; “Who are good leaders in sports and other group activities in Year 8 at your school?”; and “Who do you look up to in Year 8 at your school?” At the time of administration, students were not told the purpose of the questionnaire. A “score” for each student was calculated by counting the number of questionnaires on which they are named at least once (multiple nominations on the same questionnaire were counted as one vote). Lists were compiled by gender and 17.5% of males and 17.5% females with the highest scores were invited to a recruitment meeting, held at their school, during which they received information about the program, and were invited to a two-day out-of-school training course where they would learn about the role of “peer supporter.” Program staff aimed to include all of the potential peer supporters. However, about 3% of potential peer supporters were not invited for training because of school staff concerns about their suitability: for example persistent truancy or severe behavioral problems. Peer supporters who smoked were included but were asked to make a commitment to trying to give up. The training, which was hosted off the school site and conducted by ASSIST trainers, aimed to provide peer supporters with the information, skills, and confidence to intervene

in everyday situations and talk informally with their peers about being smoke free. Peer supporters recorded brief details of conversations in a simple diary for the following 10 weeks. Four in-school follow-up sessions conducted by the trainers provided support and encouragement to them. At the end of the program, all participating schools and peer supporters receive a certificate of achievement. In the trial, all peer supporters who handed in a diary also received a gift voucher. Outside of the trial, licensees provide various incentives to motivate and reward students.

It was important that the nomination process identified opinion leaders who would be effective in their role, and therefore had favorable opinion leader characteristics. The developers were also keen to ensure that the recruitment method was developed in conjunction with young people and was meaningful to them. In practice, the nomination process relied on measures of esteem to identify peer supporters rather than focusing on other opinion leader characteristics, such as social connectedness, innovativeness, and credibility, which may have been more difficult for 12–13-year-olds to rationalize. Consequently, a comprehensive assessment of the outcome of the technique used was conducted following intervention implementation (Holliday, 2006). This work aimed to explore the degree to which young people identified as “peer supporters” were representative of their target group and whether they were considered suitable opinion leaders by their peers. This included whether they had appropriate attitudes and behaviors (both in relation to the intervention and smoking), and whether they were therefore credible sources of smoking-related information. It also assessed adolescents’ awareness of peer supporters, whether friendship groups were represented by peer supporters, and the degree to which peer supporters were more socially connected than other students in their year group. The results of this examination are presented in brief below. More information is available elsewhere (Holliday, 2006; Holliday et al., 2016; Starkey et al., 2009).

How ASSIST Examined Opinion Leadership

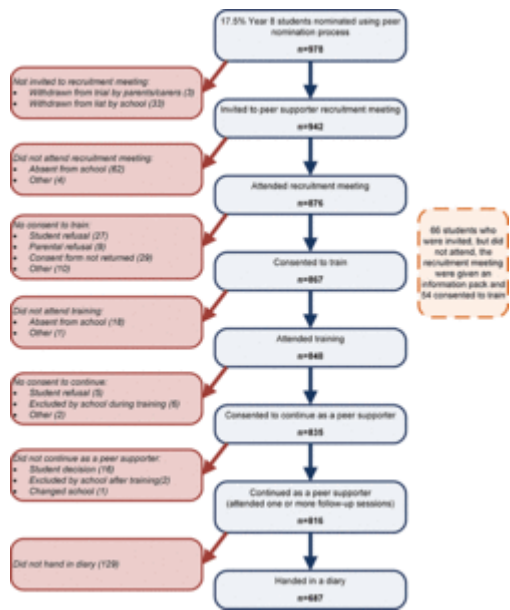
Structural elements of opinion leadership were assessed immediately post-intervention using a fixed format, free-recall social network questionnaire that asked students to name up to six friends. Due to the labor-intensive nature of data cleaning and entry, social network data first became available for schools, which had been part of the comprehensive process evaluation conducted as part of A Stop Smoking in Schools Trial (Audrey, Holliday, Parry-Langdon, Campbell, & ASSIST, 2006). This included data for both control and intervention schools. Data for further intervention schools became available at a later stage. Some data analysis was therefore conducted in just intervention schools, or where the focus of the analysis was on the social position, rather than the activities of peer supporters, both control schools, and intervention schools. In six intervention schools (n=1,155 students), non-overlapping subgroups (clusters) were identified using Klugefinder[®] (Frank, 2004) and the presence of peer supporters within these groups

assessed. Social connectivity was assessed in six intervention (n=1,147 students) and four control (n=713 students) schools using centrality measures (Freeman, 1978/1979) calculated in UCINET 6.0 for Windows (Borgatti, Everett, & Freeman, 2002). *Degree centrality* was used as a measure of the ability of the peer supporters to exert immediate influence through interpersonal communication. *Betweenness centrality* provided an indicator of a peer supporters' ability to control the flow of information in the network. *Closeness centrality* was used as a measure of a peer supporters' potential to influence others to whom they were not directly tied. The *mean distance* of peer supporters from students in a group at "high-risk" of regular smoking was used as an indicator of whether peer supporters were closely connected to this important target group.

Students' awareness of the peer supporter role, and their views of the suitability of peer supporters, were obtained from 4,991 questionnaires completed in intervention schools immediately post-intervention (Year 8), and from semi-structured individual interviews and focus groups conducted with peer supporters and non-peer supporters. Where relevant, descriptive statistics were compiled with appropriate tests of significance. Qualitative data were subjected to thematic analysis. Further information on the methods used can be obtained elsewhere (Audrey et al., 2006; Holliday, 2006; Holliday et al., 2016; Starkey et al., 2009).

Recruitment and Retention of Peer Supporters

Overall, recruitment of peer supporters was successful and retention rates were high. Ninety six percent (942 of 978) of students identified as peer supporters were invited to the recruitment meeting and of these, 87% (816) were trained and undertook the role of peer supporter (Figure 2). Despite having some reservations, only 33 of the 928 (3%) nominees were withdrawn by teachers. A further 8 students were excluded during or after the training as a result of poor behavior (Audrey, Holliday, & Campbell, 2008). In schools involved in the trial, 17.5% of young people were invited to the recruitment meeting. However, there was a variable level of attrition of peer supporters across schools and during rollout, so the percentage of young people invited to the recruitment meeting was increased to 18% to ensure that a 15% critical mass of peer supporters are trained (Stevenson, 1995).



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Figure 2. Peer supporter recruitment and retention

Characteristics of Peer Supporters

The peer nomination method used in ASSIST successfully identified a diversity of students, representative of the study cohort in terms of gender, ethnicity, and their intentions at age 16 (proxy for academic achievement) as shown in Table 1 (Audrey, Holliday, & Campbell, 2006). The most marked difference was seen in terms of self-reported smoking behavior; a significantly lower proportion of peer supporters (51.4%; 95% CI: 45.1, 57.6) were never smokers at baseline compared to non-peer supporters (57.6%; 95% CI: 53.9, 61.3) ($p=0.03$) (Holliday, 2006).

Table 3. Peer supporter characteristics at baseline

	Peer supporters n (%)	Non-peer supporters n (%)
Gender		
Male	417 (50.0)	2331 (51.5)
Female	418 (50.0)	2195 (48.5)
Total	835 (100)	4526 (100)
Ethnicity		
White	750 (92.1)	4013 (93.7)
Mixed	49 (6.0)	125 (2.9)
Asian/Asian British	4 (0.5)	61 (1.4)
Black/Black British	4 (0.5)	23 (0.5)
Chinese	0 (0)	16 (0.4)
Other	7 (0.9)	46 (1.1)
Total	814 (100)	4284 (100)
Intentions at age 16 ^A		
Stay on at school	408 (48.6)	2005 (45.1)
Training/apprenticeship/ college	250 (29.8)	1262 (28.4)
Get a job	90 (10.7)	640 (14.4)
Other/unemployed/don't know	92 (11.0)	540 (12.1)
Total	840 (100)	4447 (100)

Recruiting Opinion Leaders for the United Kingdom ASSIST Programme

Self-reported smoking behavior		
Never smokers	414 (51.4)	2466 (57.6)
High-risk group ^b	354 (43.9)	1610 (37.6)
Weekly smokers ^c	38 (4.7)	205 (4.8)
Total	806 (100)	4281 (100)

Notes:

(^a) Some students provided more than one response;

(^b) Tried once/used to but don't now/<1 cigarette per week;

(^c) ≥1 cigarette per week.

Interviewees corroborated this, reporting that a range of students were identified. They also supported attempts to ensure that both males and females were identified as peer supporters, reporting that it would be easier for girls to talk to girls and boys to talk to boys (Holliday, 2006). Data about the suitability of peer supporters were provided by 4,719 students, including 770 who consented to be peer supporters. Of these, 57% thought the peer supporters were suitable to undertake the role, and 43% had reservations about their suitability. However, these reservations were held by 17% of peer supporters compared to of 48% non-peer supporters ($p < 0.01$) (Holliday, 2006). This may have been related to peer supporters' better knowledge of what the peer supporter role involved, or a better awareness of the activities of fellow-peer supporters compared to non-peer supporters.

This uncertainty was largely supported by interview and focus group data, in which students provided mixed opinions about peer supporter performance (Holliday, 2006; Starkey et al., 2009). The majority of respondents said that some or all the peer supporters were suitable, and the discordant views by peer supporter status were not evident. The *motivation* for participating was viewed as important. Time out of school and a monetary reward at the end of the 10-week program were seen to encourage less committed students to attend the training, but this did not necessarily encourage them to embrace the peer supporter role. Other students were perceived to have more serious motivations for being involved in the program. This included an interest in being able to help other people and concerns about the health of family members.

Interviewees reported that not all peer supporters appeared willing to engage in conversations with peers about the benefits of being smoke free. Some respondents also expressed concerns regarding the *commitment* of some peer supporters, suggesting they

did not take the role very seriously, and raising questions about the degree to which they engaged with the role. However, while recognizing that more academic students would have been more attentive, and taken the role more seriously, some students questioned whether they would have credibility with students who were experimental or regular smokers.

A number of peer supporters acknowledged that *personality* was important. Some peer supporters were described as friendly and this may have made them easier to talk to. Having *confidence* was also thought to facilitate these conversations and students who were shy were thought to struggle with the role. Respondents identified some peer supporters as being established *role models* within their school and noted that they were individuals who other students listen to. Several students also reported that some peer supporters were viewed as popular among their peer group so would have lots of people to talk to, facilitating the diffusion process. However, others suggested that while popular students were nominated because lots of people knew them, they may not have had the attitudes and behaviors to be suitable peer supporters.

A significantly lower proportion of peer supporters were never smokers at baseline compared to non-peer supporters. While *smokers* were asked to make a commitment to quit, respondents reported that some peer supporters showed no evidence of trying, and this was identified as an important threat to the credibility of peer supporters. This also had the potential for negative role modeling. However, it was also acknowledged that smokers may have personally benefited from attending the training, and had more credibility with smoking cliques.

Knowledge

All peer supporters attended a two-day training course that aimed to equip them to undertake the peer supporter role, in terms of providing them with both the knowledge and skills that they would require. Non-peer supporters appeared aware that the peer supporters had knowledge gained at the training, and this may have increased their confidence in peer supporters' capacity to convey appropriate and accurate smoking-related information and encouraged them to listen to them (Holliday, 2006). However, research conducted by the ASSIST research team suggests that peer supporters passed on fairly basic messages and it is unclear how much of the information was remembered and accurately diffused. However, some of these difficulties were addressed by providing bookmarks containing facts and figures about smoking in the peer supporter diaries (Audrey, Holliday, & Campbell, 2006).

Social Ties

Eighty-eight percent (4,387) of respondents indicated that they knew at least one peer supporter. Unsurprisingly, a significantly higher proportion of peer supporters (99.9%) reported knowing peer supporters compared to non-peer supporters (85.6%) (Holliday et al., 2016).

The results of the social network analysis reported by Holliday (2006), Holliday et al. (2016) demonstrated statistically significant higher *centrality measures* for peer supporters compared to individuals who were not peer supporters. Peer supporters had more ties to other students in their school year, were more likely to be located on paths between two actors in their school network, and were closer to other students in their school year. They were also more likely to be closer to individuals in the “high-risk” group than other students in 9 of the 10 schools studied.

The majority (81=100%) of clusters identified in the school year were single sex and between 48 and 65% of clusters contained at least one peer supporter. Since an important target group of individuals for this intervention was the “high-risk” group of occasional and experimenting smokers, it was thought important that peer supporters were members of clusters containing individuals from this group. “High-risk” clusters contained peer supporters in more than 48% of cases. In almost every cluster there was at least one student who knew a peer supporter. However, in four out of the six schools, more clusters contained students who had spoken to peer supporters than there were clusters containing peer supporters (Holliday, 2006; Starkey et al., 2009). This shows that students were likely to know or talk to peer supporters outside of their own social cluster.

Discussion

The need to address adolescent health behaviors prior to them becoming embedded in their everyday lives remains a priority public health issue. Limited resources, and the view that peers are more appropriate channels through which to deliver health messages, has encouraged prevention researchers to consider peer education, including interventions that are theoretically grounded in diffusion theory. While diffusion theory is a well-established research paradigm, and much work has been conducted since the mid-1900s about what characterizes opinion leaders and how they have been identified, little research has been conducted regarding methods for identifying adolescent opinion leaders.

The scarcity of research in this field was acknowledged by researchers in the United Kingdom who, having collaboratively developed a theoretically based method for identifying adolescent opinion leaders for the effective ASSIST smoking prevention

program assessed its validity as a method for identifying opinion leaders. In the ASSIST Programme, considerable effort was made to develop a nomination technique that would best identify peer supporters who were eligible for a variety of reasons. The resultant process relied on measures of esteem, namely, whether nominees were considered good leaders, were respected, and were looked up to. This is not dissimilar to other opinion leader identification techniques, but differed in that it was developed solely for the use of this intervention using young people's definitions and feedback.

Diffusion theory suggests that opinion leaders should be relatively homophilous with their target population. Whereas some school-based peer education interventions have tended to recruit female "high achievers" who are favored by school staff (Frankham, 1998; Orme & Starkey, 1999), the ASSIST peer supporters represented the social diversity of the school year. Using a "whole community" nomination procedure, explicitly inviting a gender balance of the year, and encouraging school staff to allow all nominees to participate were key to this success. Given the predominance of single-sex friendship clusters identified using social network analysis, and that participants reported that boy to boy and girl to girl conversations may be the most effective, this practice is also likely to have contributed to the intervention effects observed among both sexes (Campbell et al., 2008). However, while it is probable that nominees were more able to identify with and communicate with a cross-section of students in the year group than has been the case in other peer-led interventions, we cannot assume that every peer supporter discouraged fellow students from smoking, or that those who did have conversations were equally effective in driving behavioral change.

Students were convinced that the nomination process had identified some suitable peer supporters. However, there were some reservations, some which could be addressed by providing further support during the training and follow-up sessions, for example, through developing communication skills. The nomination of smokers is perhaps an unavoidable outcome of the peer nomination process since the peer supporters had extensive social networks (Holliday et al., 2016), and an association between popularity and smoking has been identified (e.g., Pearson et al., 2006; Valente, Fujimoto, Soto, Ritt-Olson, & Unger, 2013; Valente, Unger, & Johnson, 2005). Furthermore, students who are current or previous members of smoking cliques (i.e., current or ex-smokers) are likely to be best placed to approach smoking peers (Audrey, Holliday, & Campbell, 2006). While some respondents considered that some peer supporters were unsuitable or lacked credibility, peer supporters were most likely to talk about smoking to their friends (Audrey, Holliday, & Campbell, 2006), and these may have been held in higher regard. It might therefore be unwise to withdraw students who some students identify as being inappropriate, or who appear to have less principled motivations for being involved. However, encouraging all students to participate should be assessed against the risks to the credibility of the message they are asked to deliver.

The majority of students reported knowing at least one peer supporter and social network analysis demonstrated that the ASSIST nomination process identified opinion leaders from across each school year group (although there was some variation in the degree of representation between schools). This is in line with recommendations that opinion leaders should represent a diversity of social groups and supports the use of whole community nomination approaches and the inclusion of all nominees in the program. The ASSIST peer supporters were better connected and had more extensive social groups than other students in their year. They therefore had more potential to exert direct social influence, control the flow of information in their social networks, and exert influence through indirect communication, including on the intervention's primary target group.

Research into the ASSIST nomination process provides evidence of the peer supporters' *potential* to facilitate behavioral change. It does not confirm the extent to which peer supporters spoke with their friends about smoking or whether conversations led to the observed reductions in smoking uptake. It remains possible that peer supporters induced change through one, or a combination of three processes: change resulting from conversations between peer supporters and other students; change resulting from indirect communication, that is, information received from peer supporters is subsequently communicated to others; or change resulting from the modeling of non-smoking behavior, or anti-smoking values.

The demonstrable success of the ASSIST Programme has led to broader implementation in the United Kingdom and France. Evidence from quality assurance monitoring demonstrates high levels of satisfaction with intervention delivery among those delivering, and in receipt of, the intervention. The use of the ASSIST peer nomination process, as opposed to other more sophisticated methods of opinion leader nomination facilitates this. It is easy to administer, easily comprehensible for young people, and the "results" are straightforward to obtain. While sociometric methods may also be readily understood by young people, such methods can be very time consuming and costly to administer, and data analysis requires significant expertise. The likelihood of such methods being used on a large scale is therefore questionable.

In the ASSIST Programme, three simple questions identified students with the personal characteristics and interpersonal networks of opinion leaders. It is possible that this approach could be used to identify socially influential individuals for similar interventions. However, given the different attributes of opinion leaders required in different cultures, interventions and the changing landscape of adolescent communication in an increasingly digital world, it is probable that the questionnaire would require amendments and may not guarantee the results obtained in ASSIST. Such changes should be considered carefully and piloted thoroughly. Learning from this program suggests that taking time and effort, and consulting end users throughout the design and development opinion leader nomination techniques may be key to their success. Furthermore, careful thought should also be given to how to deal with negative

outcomes of nomination techniques in order to maximize the long-term effectiveness of interventions.

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Jo Holliday

Department of Population Health, University of Oxford

Suzanne Audrey

School of Social and Community Medicine, University of Bristol Centre for the Development and Evaluation of Complex Interventions for Public Health Improvement

Rona Campbell

School of Social and Community Medicine, University of Bristol Centre for the Development and Evaluation of Complex Interventions for Public Health Improvement

Laurence Moore

University of Glasgow School of Medicine, MRC/CSO Social & Public Health Sciences Unit

