THE
BEHAVIOURAL
INSIGHTS TEAM

I get by with a little help from my friends: Two field experiments on social support and attendance in further education colleges in the UK[1]

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Abstract

In recent years, there has been an increasing recognition that broader socioeconomic and environmental conditions such as school climate and the availability of peer, parental, and tutor support shape motivation and educational success as much as, or more than, individual-level factors such as personality. Whether a student grows up feeling nurtured and supported by their family and peers is strongly correlated with their emotional and physical well-being (Scales & Taccogna, 2001; Wentzel & Caldwell, 1997). However, few studies provide causal evidence that social network interventions can influence students' success. We investigate, through two randomised field experiments, whether providing students' social networks with personalised information about upcoming exams and course content leads to improvements in class attendance. Students nominated two 'Study Supporters' and were subsequently individually randomised into two arms: in one arm the Study Supporters receive weekly text messages, in the other arm they do not receive any. We consistently find positive effects of this intervention, particularly for students who are studying towards GCSE exams. We also find that the intervention appears to be particularly effective for students at the lower end of the distribution of attendance. We discuss this result in the context of the broader social support literature.

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I. Introduction

During periods of education, many of us might take for granted that someone in our lives cared about our learning and would regularly talk to us about it. If we did not have that someone, be it a parent, grandparent, family friend, or someone else, our education might have panned out differently. At the same time, we have all experienced what it feels like to struggle with something and not know who to turn to. Unfortunately, however, the problem may not be that the people around you do not want to be involved. Rather, they may not know how to help, and we might not know how to ask.

Drawing on the literature on parental engagement and behavioural interventions, we develop a social support intervention that seeks to improve the frequency and quality of communication between a student and their close friends and family. By focusing on socio-emotional factors in the student's environment, we may be able to harness the power of social interactions to improve student success. Johnson and Johnson (1985) articulate this concept well:

> *Motivation to learn is inherently interpersonal, created by internalized past relationships and by current interpersonal influences. Other people provide the purpose, meaning, and support for learning by providing approval and respect for one's academic accomplishments. Humans, not machines, materials, personality characteristics, or external appeals, motivate humans*. (p. 250)

Increasing the extent to which people feel supported by their friends and families might increase their motivation, and, with it, their likelihood of persistence. A modest but growing number of studies attempt to boost supportive communication using nudge-type approaches to improve outcomes (Kraft & Rogers, 2015; Rogers & Feller, 2016). This paper aims to contribute to this literature. We conduct two field experiments in further education colleges in the United Kingdom, testing an intervention in which students nominate 'study supporters' to support their learning, who are then sent a series of text messages providing them with information about the student's course, and encouraging them to support the student.

Previous communication interventions with adolescents have typically focussed distinctly on prevention. For example, they might focus on improving parent-child communication surrounding risky health behaviours such as smoking or teenage pregnancy (Blake et al., 2001). This paper, on the other hand, presents causal evidence that a social support intervention can help promote positive behaviours such as school attendance.

The structure of this paper is as follows. In section 2 we review the theoretical background of the social support intervention and briefly discuss the policy context of our interventions. Section 3 focuses on our primary outcome measure: class attendance. This is followed by a description of experiment 1 and its key findings in section 4, then by a description of the methods and results of experiment 2 in section 5, and analysis of the pooled data from both experiments in section 6. Finally, we offer conclusions.

II. A review of the literature

Social support: a conceptual framework

Social support can be defined as an "individual's perception of general support or specific supportive behaviours (available or acted on) from people in their social network" (Malecki & Demaray, 2003, p. 232). This global definition of social support overlaps with concepts of social networks, support systems and social integration, in the sense that all four are concerned with the social resources available in our personal communities (Gottlieb & Bergen, 2010). Throughout this paper, we conceive of social support as an individual's perception, rather than an observable social structure. It is difficult to observe social support in action, as it is often not the materialisation or expression of support that counts, but the belief that support is available (Gottlieb & Bergen, 2010). Additionally, the quality of support provided, from the recipient's perspective, is difficult to measure behaviourally. The concept of social support is therefore best measured using self-report instruments, in order to capture perceived support.

There are several sources and types of social support. The source of support can be anyone close to the individual, including parents, teachers, classmates or friends (Demaray & Malecki, 2002). Specific types of social support include emotional, instrumental, informational and appraisal support (House, 1981). Emotional support is characterised by emotionally close, encouraging, accepting and caring relationships. Instrumental support, on the other hand, involves active helping and the provision of material resources, such as help with transportation. Informational support involves the communication of expectations, knowledge, guidance and feedback. Lastly, appraisal support is typified by receiving positive appreciation for one's efforts (Gottlieb & Bergen, 2010; Malecki & Demaray, 2003).

The protective role of social support and the harmful effects of its absence

Feeling supported and encouraged by the people in our immediate social network is important. Baumeister and Leary (1995) first theorised that this 'sense of belonging' is a basic human need. The authors found evidence that the absence of social support and

belonging links to poor physical and emotional well-being outcomes. Adolescents who feel alienated from their school communities, and social communities more widely, are not only more likely to drop-out, but also feel more school-related anxiety, loneliness and depression (Chipuer, 2001; Demaray & Malecki, 2002; Khatib, Bui & Stansfeld, 2013).

By contrast, the presence or availability of social support has also been linked to better physical and emotional health outcomes (Viner et al., 2012). University students who reported that they had social support resources available to them reported lower levels of poor health symptoms than those who could not identify such resources (Hale, Hannum, & Espelage, 2005). Other researchers have found that the presence of social support reduces chronic, labour, and cardiac pain (Macdonald & Leary, 2005). In a meta-analysis of 81 studies on the effects of social support on health outcomes, Uchino et al. (1996) conclude that the support is reliably related to better immune responses to acute stress, lower rates of morbidity and mortality, lower coronary heart disease, and lower blood pressure, after controlling for personality factors.

There are also clear indications that both the subjective sense of social belonging and the availability of social support promote engagement and long-term learning. Children who experience secure attachments with people in their social networks showed greater emotional and behavioural engagement in school (Furrer & Skinner, 2003; Ruzek et al., 2016), reported higher general life satisfaction (Danielsen et al., 2009) and show greater prosocial goal pursuit (Wentzel, 1998). In studies with adolescents at risk of school failure, those who did not feel socially supported reported lower attendance, fewer pro-social behaviours, having fewer close friends, and lower self-esteem than adolescents not identified as at-risk (Rosenfeld, Richman, & Bowen, 1998; Rosenfeld & Richman, 1999). Social support may have positive effects on student outcomes in various ways. Supportive communication may help the student feel more in control. Interacting with individuals who provide support may also help them develop strong interpersonal skills. Lastly, recognising that help is available, and knowing where to find it, may help students to deal with stressful situations more effectively (Rosenfeld & Richman, 1999).

Parental involvement and educational outcomes

Although adolescence is often seen as a transition period where parental support gradually becomes less important while peer support becomes crucial to wellbeing, longitudinal studies rather suggest that parents' supportive involvement is strongly predictive of their child's adjustment (Stice, Ragan & Randall, 2004; Rogers, Wiener, Marton & Tannock, 2009). Other studies suggest that quality of the parent-adolescent relationship fosters the development of identity (Meeus, Oosterwegel, & Vollebergh,

2002). These studies suggest that more research is needed on how schools, and specifically for this study further education (FE) colleges, can foster both a better parent-school relationship and supportive parent-adolescent communication. In the studies reported in this paper, students can nominate anyone from their social networks to be Study Supporters. They nominated a wide variety of people, including grandparents, aunts and uncles, parents, brothers and sisters, sport coaches, family friends, and classmates. However, we address the literature on parental involvement as on average 1 out of 3 students in our sample chose at least one parent or guardian as their study supporter.

The literature shows a clear association between parental involvement and the educational outcomes of their children. In a longitudinal study of impoverished youth in an urban area, the probability of high school completion increased significantly when parents participated in their child's school activities (Smokowski et al., 2004). Similarly, a synthesis of nine meta-analyses shows that parental involvement is positively and consistently correlated with the academic achievement of their children, across age groups and ethnicity (Wilder, 2014). Additionally, perceived parental support is associated with lower incidence of internalising problems in adolescence, such as anxious and depressive symptoms (Stice, Ragan, & Randall, 2004). Although these studies focus mostly on students until the age of 16, the students in our sample often still lived at home with their parents and were aged between 16 and 18 years old. It is therefore reasonable to believe that parents' involvement would still have a positive influence on their children's academic achievement.

Although most parents want to be 'good' and involved parents, many report barriers to supporting their children's schooling as they get older (Harris & Goodall, 2008). Parents' level of engagement varies strongly by their socio-economic status, educational attainment and emotional capital. While many parents reported that they would like to engage more in their children's schooling, they sometimes struggle to overcome material and psychological barriers. For example, parents often feel restricted by work commitments and their own sense of personal efficacy (Harris & Goodall, 2008). The conditions that must be in place for parents to get involved are manifold. They must know what it is they are supposed to do, when they should do it, and they must believe their involvement will make a positive difference. Parents also need to get the feeling that the educational institution invites them to get involved (Hoover-Dempsey et al., 2005).

Extrapolating from this focus on parental beliefs and behaviours, a similar dynamic for close friends and extended family members may be plausible here. When students' close contacts are not confident in their ability to help, or are unclear how much they should

be involved, their persistence and motivation to help the student succeed may be impaired. Their involvement may be strengthened if the college invites them to get involved, and if they receive clear instructions for involvement. The current text messaging trial was designed to provide study supporters with timely, relevant and actionable prompts from the college, with the aim to increase study supporters' self-efficacy and involvement with the student's education. These studies support the hypothesis that physical and emotional wellbeing in adolescence is at least in part determined by social processes. Growing up in a supportive family, and being surrounded by positive and supportive peers is crucial to improve young people's chances in life.

Nevertheless, these studies often merely describe the presence of support as a fixed factor. It is either present, or it is not. However, recent intervention studies suggest that supportive communication can be promoted, in turn improving educational outcomes (Castleman & Page, 2016; Rogers & Feller, 2016; Robinson, Lee, Dearing & Rogers, 2017). Leveraging parents, peers and teachers has the potential to increase not only educational success, but also students' emotional and physical health outcomes. Below, we turn to the growing body of research that shows how social support can be stimulated or elicited.

Empowering key individuals to help improve young people's educational outcomes

An independently evaluated randomised controlled trial (RCT) used text messages to inform students' parents of missing homework and absences in maths, science and English class (Miller et al., 2016). 93 % of people in the UK personally own a mobile phone (Ofcom, 2015), making text-messaging technology an inexpensive and scalable method to motivate, inform, and remind individuals at key moments. The Parent Engagement Project (PEP) was a large-scale multi-site cluster RCT, with 15,697 students across 36 secondary schools. Students whose parents received text messages outperformed their peers in science comparable to one month of additional progress, but this improvement in test scores was not observed for English or maths. It is important to understand what mechanisms led to these observed outcomes. Through phone interviews with over 1900 parents of intervention pupils, the research team surveyed parents about their engagement in their child's learning. The odds of parents who received the text messages (treatment) talking to their child about studying for an upcoming test were almost three times greater than the odds of parents who did not receive text messages talking to their child about revising. Interestingly, no differences were found for the other measures of parental involvement, such as whether the parent has talked with their child about attendance, grades, or what they learnt in school. Nevertheless, receiving short, weekly prompts from school may have helped parents take a more active role in their child's education.

A similar study by Kraft and Rogers (2015) found that weekly text messages from tutors to parents helped prevent drop-out, with a decrease in students who failed to earn course credit from 15.8% to 9.3%. Furthermore, the probability of a student being absent was reduced from 12% in the control condition to 9.5% in the teacher-to-parent communication condition. The mechanisms through which the messages affected student success were assessed through teacher and student surveys, and phone interviews with parents. Although the researchers do not find evidence of the text messages increasing the occurrence of supportive conversations overall, students in the treatment reported that their parents spoke to them more often about things they should work on to do better in school (Kraft & Rogers, 2015). The authors propose that the text messages helped to improve the effectiveness of conversations, rather than increase their frequency.

The above studies focus on leveraging parental support. To date, few studies seek to leverage peer support to promote educational success. Peer-led interventions typically focus on prevention, such as smoking, substance abuse or dating violence (see for example Campbell et al., 2008; Faggiano et al., 2010; Wolfe et al., 2009). Additionally, these interventions are often delivered inside the classroom. Nevertheless, peer-led interventions where students are trained to act as peer supporters can lead to clear improvements in the target behaviour. For example, Campbell et al. (2008) evaluated the effectiveness of a whole-school intervention delivered across 59 schools in the United Kingdom. External trainers trained influential students to encourage their peers not to smoke, by providing them with information about the short- and long-term risks of smoking. They also taught these 'peer supporters' listening and communication skills. Campbell et al. (2008) found that the odds ratio of being a smoker in intervention schools compared to control schools was 0.75. The reduction in uptake of regular smoking was sustained for 2 years after programme delivery. However, this type of intervention is relatively costly in comparison to text messaging interventions, which can often be delivered for less than £5 per student. The peer-led communication interventions also typically do not focus on promoting educational success. Before we turn to our experimental design, we briefly discuss the educational context of our studies conducted in Further Education colleges in England.

The policy challenge of helping post-16 students succeed in Maths and English

On average, the returns to achieving maths and English qualifications are positive and significant. For example, those who achieve their maths and English at FE colleges earn on average 4.2% more than those who did not achieve (Cerqua & Urwin, 2016). Achieving

basic levels of literacy and numeracy are also associated with improved life outcomes, including the chances of getting a job interview (Sanders et al., 2016), retaining work (Hanushek et al., 2015; McIntosh & Vignoles, 2000), as well as social benefits such as lower crime rates (Feinstein, 2002), and increased civic participation and social cohesion (Feinstein, Budge & Vorhaus, 2008). Higher skills levels also affect outcomes at a national level. The distribution of skills is central to intergenerational mobility and the country's growth rate (Burgess, 2015).

Students sit the General Certificate of Secondary Education (GCSE) maths and English exams at the end of compulsory school education at age 16. Last year, 41.3% of all students in England failed to achieve either maths, English or both GCSEs at A*-C, the scores that qualify as a `pass' (DfE, 2016b, p. 8). Since 2015, all UK students are required to stay in education or training until their 18th birthday (Education and Skills Act 2008; c. 25). Additionally, if students did not pass their maths and English GCSEs at age 16, they are not required to continue pursuing these or other equivalent qualifications at 16-18 (condition of funding requirement, EFA, 2014). As a result, 60% and 54% of students who failed their GCSEs in maths and/or English at age 16 go on to retake the subject at an FE college, respectively (Porter, 2015). In 2015, 110,811 and 100,239 students went to an FE college to retake their GCSEs in maths and English, respectively (Porter, 2015). FE colleges also provide maths and English qualifications to adult (19+) learners, although many of these courses are part-time or short-term intensive (BIS, 2016). The experiments described below only include adult learners on full-time, year-long maths and English courses, of which there are fewer than 16-18 year old students.

FE college students generally pursue either Functional Skills (FS) or GCSE qualifications in maths and English, where the latter were designed to prepare students for higher study and the former to prepare students for the world of work. GCSEs are regarded as the `gold standard' by many since the Wolf report was published (Wolf, 2011), but others posit that FS qualifications are more relevant to the jobs young people are being trained to do (The Education and Training Foundation, 2015). FS qualifications are delivered at five levels (Entry 1,2, 3, Level 1, 2), but only students pursuing Level 1 or 2 took part in the experiments reported below. FS Level 1 is equivalent to GCSE D-G and FS Level 2 is equivalent to GCSE A*-C. This is to ensure that students on GCSE and FS qualifications are of similar skill levels.

Despite the important role FE plays in promoting better skill levels, there is relatively little quantitative research into the causes of success or failure in this environment. The greater and growing literature investigating improving educational outcomes is typically

focused on traditional learning environments, such as school and university, and operating across the population of students. There are good reasons to suspect that the environment of an FE college, and the people attending them, are different in many ways to mainstream education.

Firstly, students re-taking GCSEs are distinguished by having already failed the exams towards which they are working. Maier and Seligman (1976) coined the term "learned helplessness", which is a mental state where individuals' motivation is undermined by experiencing negative contextual conditions, causing them to fail even in relatively low stakes situations. Having already failed the high-stakes maths and English GCSE exams once, and having to retake these, can lead to low self-efficacy, or the feeling of not being in control of one's own learning. A recent qualitative study carried out in the UK shows that many FE college students who previously failed their GCSEs at age 16 feel demotivated, have weak coping skills, and struggle to feel intrinsically motivated (Anderson & Peart, 2016). Additionally, the latest Government statistics on maths and English progress show that few FE college students go on to achieve better grades by age 18 than they did at age 16 (DfE, 2017). On average, a student's point score goes backwards during their 16-18 studies, by -0.28 for English and -0.31 for maths. In 2016, only 22.8 and 22.4 per cent of students pursuing GCSEs at age 16-18 pass their English and maths, respectively (at grades A*-C; DfE, 2017). The 16-18 cohort is more likely to be made up of low attainers in comparison to the age 16 cohort, and therefore require additional support.

FE college students have also been found to have lower educational aspirations than students from non-FE settings; instead they often focus on career and wealth goals (Baird, Rose & McWirter, 2012). Experimental evidence supports the hypothesis that student motivation is low in FE colleges. Chande et al. (2015), found that average attendance starts at 70% at the beginning of the academic year, declining sharply over the first term of enrolment. Policy makers, researchers and the FE college sector have called for renewed focus on helping post-16 students succeed in their maths and English studies. However, FE colleges are facing significant challenges, both in terms of the recent 25% funding cuts (BIS, 2012) and sharp increases in student numbers. Our intervention is therefore low-cost, scalable, and easy to administer. Before describing the first experiment, we turn to the relevance of our outcome variable: attendance.

III. Outcomes and measurement: the predictive power of attendance

Student non-attendance has been a cause for concern both in further and higher education institutions (Newman-Ford et al., 2008). Class attendance is a better predictor of grades in a class and overall grade point average (GPA) than any other known predictor of academic achievement, including study habits and scores on standardised tests (Credé, Roch & Kieszczynka, 2010). Looking at administrative data from a higher education institution in the UK, Newman-Ford and colleagues (2008) find a statistically significant correlation between class attendance and academic attainment. The link between absence and attainment has also been studied by the UK Department for Education using full-year absence and attainment data to calculate odds ratios (DfE, 2016a). Students at Key Stage 4 (age 15-16) are 2.2 times more likely to achieve five good passes for their GCSE exams than their peers who miss between 10 – 15% of classes. After controlling for other factors, such as having special educational needs or being eligible for free school meals (a proxy for being disadvantaged), absence was still significantly and negatively related to attainment (DfE, 2016a).In summary, correlational yet real-world studies have shown that attendance is predictive of academic achievement. It is challenging to test in a field experiment whether better attendance results in improved achievement, as this would require the researcher to manipulate attendance by randomly assigning students to attend or skip class. Those who attend all classes are likely quite different in terms of motivation or may face fewer practical obstacles than those who miss a significant number of classes. Nevertheless, a recent RCT evaluation of a student mentoring program shows that these barriers to attendance can be targeted by personalised interventions (Guryan et al., 2016). Helping those who miss classes regularly to attend class more often is a primary aim of the experiments discussed in this paper.

At a practical level, attendance is an important and relevant outcome measure because it can be easily and precisely measured. A wealth of information on student behaviour is available from college administrative datasets. The use of administrative datasets has recently become more popular in impact evaluation, as it allows the researcher to gather information about real-life behaviour of large amounts of people (Figlio, Karbownik & Salvanes, 2015).

We collect attendance in a week-by-week format, where potential and missed attendances are recorded for all participating students. As described in more detail under the data headers in Experiment 1 and 2, we average attendance for the subject (maths or English) in which the student was treated.

IV. Experiment 1

Our first experiment was carried out in five colleges in England. Colleges were recruited as part of a nationwide recruitment campaign and were deemed eligible to participate based on their having given consent and being of a suitable size.

Design and Intervention

Students who signed up at the beginning of the academic year 2015/16 to take part in the intervention were asked to nominate two individuals they believed would be supportive of their learning as "study supporters". Students nominated two 'Study Supporters' and were subsequently individually randomised into two arms: in one arm the Study Supporters receive weekly text messages, in the other arm they do not receive any. Figure 1, below, shows the flow of participants through the experiment.

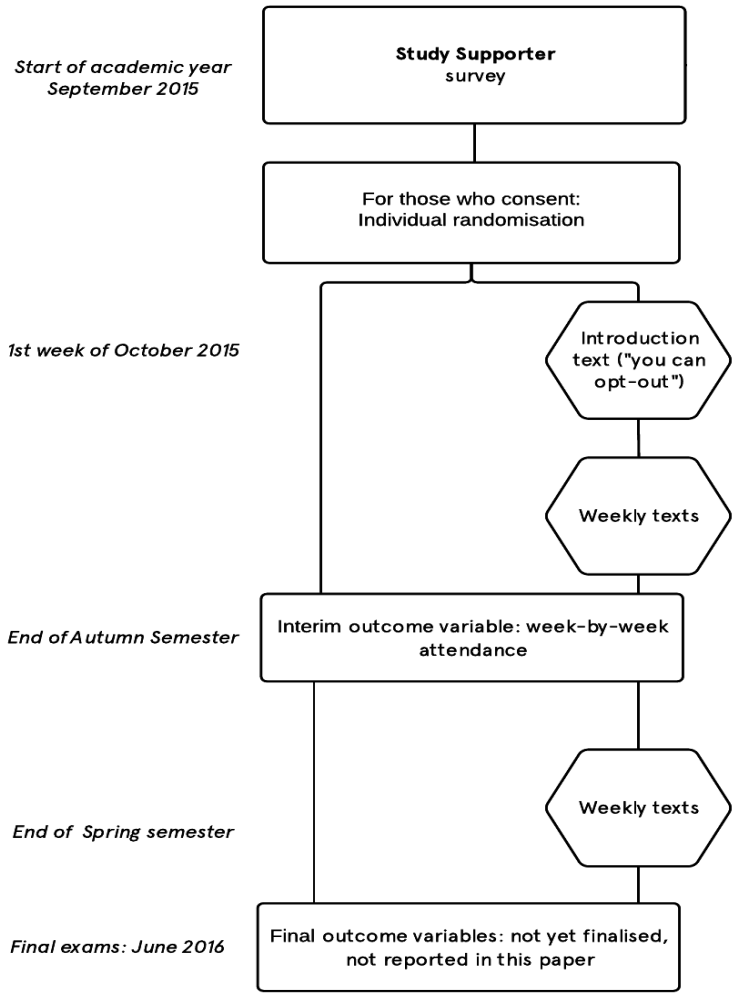

Figure 1: Participant Flow Diagram, Experiment 1

The messages were co-authored by college academic tutors and were designed to encourage the supporters to ask the student how revision is progressing, to praise the effort the student is making and to wish the student luck ahead of exams and assessments. The intervention was intended to be a low-cost and light-touch process for college staff and administrators. Text messages were sent to students' 'study supporters' mobile phones at weekly intervals during the academic year. It was delivered between September 2015 and June 2016 to students studying the subjects of maths and/or English, taking either GCSEs or FS (Level 1 or 2) qualifications. The types of text messages that nominated study supporters were sent included the following information: (a) course content, (b) advance notice of upcoming exams, (c) academic resources available to the student, and (d) general positive reflexive conversation prompts. All supporters were sent a balanced mix of the above categories. For example, a message for to supporters of students taking a GCSE maths class read as follows:

> *Hi [supporter forename][2], [learner forename] has recently learnt about percentages. Ask [him/her] to calculate the final price of a £250 TV after adding 20% VAT (tax on things you buy) and show you how [he/she] worked it out. Thanks, [College]*

Similarly, a message to supporters of students taking an FS English class read:

> *Hi [supporter forename], please ask [learner forename] if [he/she] has been working on [his/her] individual SPaG (personal development) targets on the BKSB website. Also, please ask if [he/she] is practising spelling and punctuation: hard work pays off! Thanks, [College]*

All colleges received a unique schedule of text messages, as their content was tailored to college exam and term dates, and the course curriculum. However, members of the research team wrote the majority of text messages and checked whether the length and content of messages were comparable across colleges. See Appendix F for additional text message examples. A total of 35 weekly messages were sent out to study supporters, an average of one message per week. There was no variation in dosage between colleges or types of courses.

[2] The fields in brackets '[...]' were automatically merged with student data on the text messaging platform, FireText, ensuring that all recipients received personalised text messages.

Data

The structure of our data are as follows. Each student was treated only in their maths or English course, even if they take both courses. The course assignment was determined at a college level: some colleges implemented the intervention only in their maths courses, and some colleges only did so in English courses. See Table 1 for the college-level assignment to maths and English. If a student at College A (assigned to maths) took both maths and English, they were only treated in their maths class. Therefore, each observation in the dataset corresponds to an individual in the course (either maths or English) their Study Supporters were texted about. However, a small number of participants (N = 25) are identified in our data as taking both GCSE and FS classes, and our model distinguishes between the two. Appendix A shows the distribution of attendance rates within our study, and Table 1 displays the mean attendance rate for each college.

College administrative datasets of week-by-week attendance data are merged with consent form data, which provide an indication of who consented to be part of the study supporter intervention, as well as their random assignment to treatment or to control. Table 1, below, shows the sample size for each college, divided between participants who consented to be part of the trial but who were assigned to the control, and those who consented and were assigned to treatment.

Table 1: Consent and Treatment Assignment, by College, Experiment 1

College	Control	Treatment	Total	Subject Treated	Average Attendance (SD)
College A	90	93	183	Maths	60.3% (31.5%)
College B	125	128	253	English	61.0% (28.8)
College C	97	99	196	English	77.1% (24.2%)
College D	90	112	202	Maths	55.5% (21.7%)
College E	93	94	187	Maths	58.0% (21.7%)
Total	*495*	*526*	*1021*	-	*62.4% (28.4%)*

Note: Randomisation is conducted stratified on participants class, preferencing treatment assignment. Hence, if a class contains 10 individuals, 5 will be treated and 5 controlled, but if a class consists of 11 individuals, 6 will be treated and 5 controlled.

Participants

Data on gender and age is collected sporadically through data provided by the college. Even where it is collected, this data is not complete in its recording, and so the data are patchy. In order to avoid losing data, we code age and gender as 0 where they are missing and create a binary indicator for missingness for each of age and gender. 29% of students do not report their gender. Among those that do, we see a roughly even split, with 51.4% of students are male and 48.6% are female. The majority of students are between 16 and 18 years old (56.4%), and we see relatively few adult students (aged 19 or above; 14.5%). For 29.1% of students we do not have data on age or gender (this does not appear to be associated with a particular problem).

Class identifiers do not uniformly report the subject of study (Maths or English), or the level being studied (FS, GCSEs). Having identified students' courses as best we can, we exclude courses, where possible, that were not treated in that college. For example, in college D, only maths classes were treated, and so English classes are excluded from our dataset. For some participants, we are unable to correctly identify whether their classes are for English or Maths due to ambiguous class identifiers, and so an average of the available attendance data for *all* classes in which that student is registered is created. In most cases, this produces a dataset containing one observation per participant.

Relationship with nominated Study Supporters

During the sign-up procedure at the start of the Autumn term semester, students were asked to describe their relationship with the person(s) they nominated. Their free-text responses were subsequently coded and categorised into broad types of relationships, see Appendix B. The majority of students nominate either a member of their nuclear family (41.3%) or a peer inside or outside of college (40.5%).

Analysis strategy & Results

We now proceed to analysis. Our first regression table, Table 2, reports estimates from the following linear regression model:

$$A_{igc} = \alpha = \beta_1 S_i + \boldsymbol{\beta_2 L_g} + \beta_3 C_c + u_{igc}$$

where A is the percentage of classes that individual i in class (group) g in college c attended in the period covered by our data. S is a binary variable set to 1 if a participant is assigned to the study supporter treatment, and 0 otherwise. L is a vector of class-level binary variables indicating whether the class studies for FS qualifications or GCSEs (the omitted category is where the participant's level of study is missing), and whether a

participant is male, C is a vector of college fixed effects, and u is an error term account for clustering at the class level.

Column 1 of Table 2 reports this analysis for our full sample. Column 2 reports it only for GCSE students, column 3 only for FS students. Column 4 reports the same analysis for students on English courses, and column 5 for students on maths courses.

Table 2: Main effects, Experiment 1 (OLS Regressions)

	(1)	(2)	(3)	(4)	(5)
	All	GCSE	FS	English	Maths
Study Supporter	2.719	4.757*	2.138	-0.266	5.018*
	(1.717)	(2.364)	(3.096)	(2.719)	(2.187)
Gender: male	-7.425***	-6.554**	-4.058	-10.812***	0.678
	(2.003)	(2.519)	(3.084)	(2.800)	(3.063)
FS	6.612*	3.151	0.000	10.593	2.803
	(3.337)	(5.372)	(.)	(5.998)	(4.417)
GCSE	0.285	0.000	-4.254	5.199	-3.104
	(2.344)	(.)	(3.822)	(4.464)	(2.821)
Constant	61.700***	60.612***	67.890**	56.053***	69.709***
	(3.352)	(2.634)	(23.489)	(5.729)	(4.621)
College Fixed Effects	Yes	Yes	Yes	Yes	Yes
N	1021	558	231	442	579

Notes: Ordinary least squares regressions. Standard errors, adjusted for clustering at the level of the class, in parentheses. Note that columns 2 and 3 do not sum to 1021 as for some classes we are unable to determine whether participants study FS or GCSEs.
** =p<0.05, ** = p<0.01 *** = p<0.001.*

In this main analysis, we find a small overall effect of our intervention, which is not statistically significant (p = .114). Among participants taking their GCSEs (who are typically younger in our sample (p = .045)), we find a statistically significant 4.76% point increase in attendance as a result of our intervention (62.7% attendance for treated GCSE students, compared to a control group mean of 57.9%, p = .045). We also find that the intervention was effective when delivered in maths courses (p = .022), but not when delivered in English courses.

V. Experiment 2

Design and Intervention

In our second trial, conducted contemporaneously with the first, is a subset of a larger trial (reported in Behavioural Insights Team (2016)), in which a subsample of classes are randomly assigned to be part of the study supporter trial. The colleges in Experiment 1 were unable to implement the suite of three interventions as the two other interventions, Grit and Values Affirmation required more intensive college support and in-class time. Colleges who were unable to commit to implementing all three were therefore assigned to implement our social support intervention only which requires very little in-class time. Nevertheless, implementation of the study supporter intervention was not affected by college organisational constraints. Members of the research team, external to the colleges, collected the data and administered all text messages. The procedures were identical between Experiment 1 and 2, and carried out simultaneously.

For colleges in Experiment 2, participants within the classes assigned to be part of the study supporter trial were asked to consent to being part of the study, and to provide details of two study supporters. Participants who consented and provided this information were individually randomised to treatment and control. Within these classes, 48% of participants consent to being part of the study.

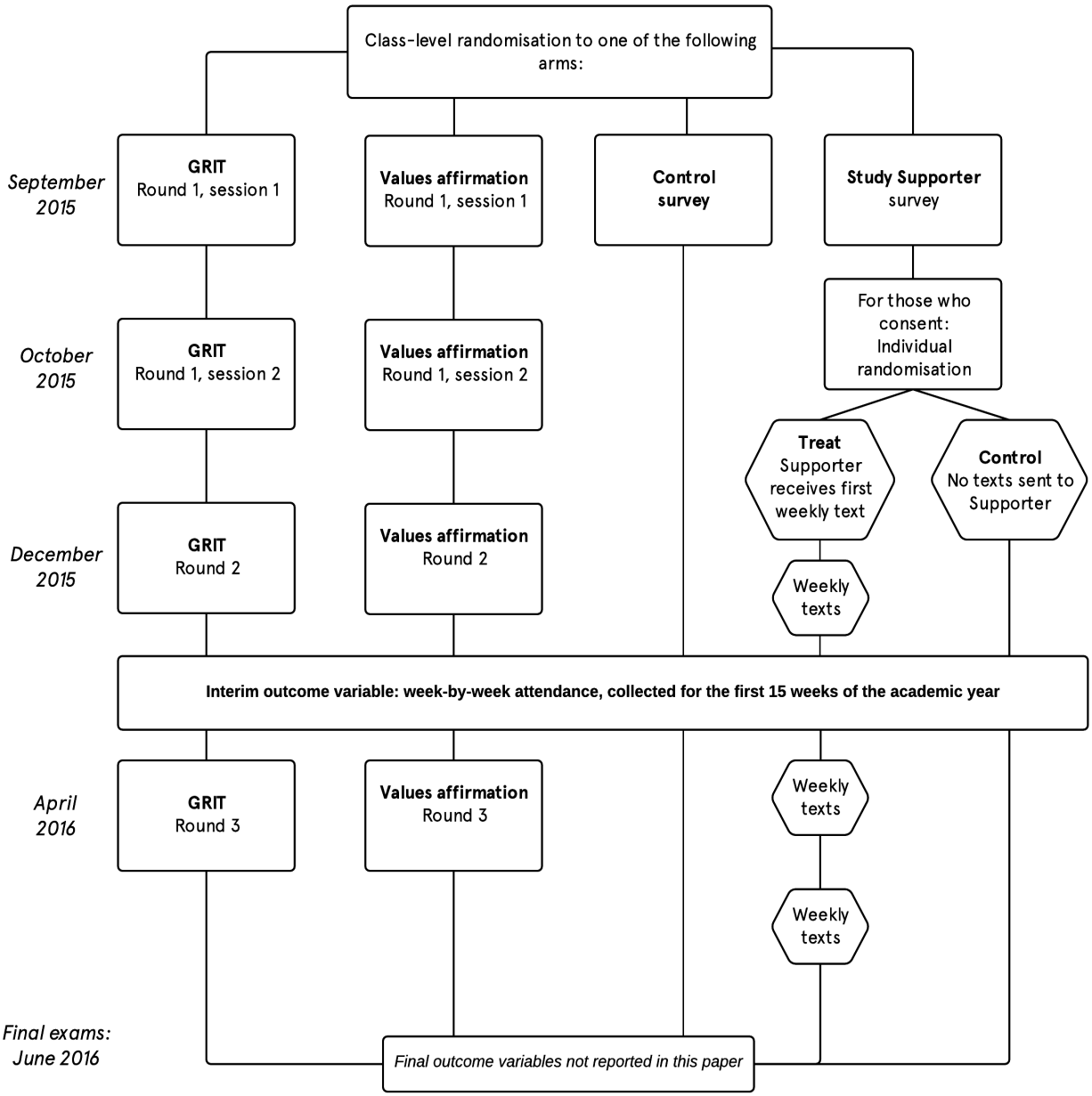

Figure 2: Participant Flow Diagram, Experiment 2

Data

The structure of our data are as follows. The college administrative datasets of week-by-week attendance data are merged with consent form data, which provide an indication of who consented to be part of the study supporter intervention, as well as their random assignment to treatment or to control. See Table 3, below, for the sample size of participating students in each college. Appendix C shows the distribution of attendance rates in Experiment 2, and Table 3 displays the average attendance rates for each college in this study.

Table 3: Consent and Treatment Assignment, by College, Experiment 2

College	Control	Treatment	Total	Subject Treated	Average Attendance (SD)
College F	27	25	52	English	44.3 (35.3)
College G	40	42	82	English	69.2 (28.9)
College H	109	126	235	Maths	65.7 (25.0)
College I	49	36	85	Maths	25.1 (36.1)
Total	*226*	*229*	*455*	-	*56.3 (33.6)*

Participants

In Experiment 2, we have complete data for age and gender. We see a roughly even split of gender where 56.3% are male and 43.7% are female. As in Experiment 1, students between the ages of 16 and 18 are more commonly found in the dataset (93.2%) than those aged 19 or above (6.8%). Class identifiers do not uniformly report the subject studies (Maths or English), or the level being studied (FS, GCSEs). Variables are derived here similarly to Experiment 1, and are displayed in the table in Appendix D.

Relationship with nominated Study Supporters

During the sign-up procedure at the start of the Autumn term, students were asked to describe their relationship with the person(s) they nominated. Their free-text responses were subsequently coded and categorised into the following broad types of relationships, see Appendix E. Similar to Experiment 1, students most often nominate two categories of study supporters, namely nuclear family (44.6%; parents, brothers and sisters) and peers (42.2%; both from inside and outside of college).

Analysis

We now proceed to analysis. Our second regression table, Table 4, reports estimates from the following model;

$$A_{igc} = \alpha = \beta_1 S_i + \beta_2 L_g + \beta_3 C_c + u_{igc}$$

Where A is the percentage of classes that individual I in class (group) g in college c attended in the period covered by our data. S is a binary variable set to 1 if a participant is assigned to the study supporter treatment, and 0 else. L is a vector of class level binary

variables indicating whether a class studies English or Maths (the omitted category is that neither English nor Maths are recorded), and other treatments applied to this class outside of the study supporter trial, whether the class studies towards FS or GCSE qualifications, C is a vector of college fixed effects, and u is an error term accounting for clustering at the class level.

Column 1 of Table 4 reports this analysis for our full sample. Column 2 reports it only for GCSE students, column 3 only for FS students. Column 4 reports the same analysis for students on English courses, and column 5 for students on maths courses.

Table 4: Main Results – Experiment 2

	(1) Full sample	(2) GCSE	(3) FS	(4) English	(5) Maths
Study Supporter	7.596**	7.990*	6.865	7.433	7.479*
	(2.752)	(3.281)	(4.497)	(5.483)	(3.172)
Gender: male	-2.374	-1.507	-4.605	3.823	-4.668
	(2.788)	(3.307)	(4.622)	(5.763)	(3.169)
16-18 years old	6.192	8.710	-0.002	7.797	4.880
	(5.493)	(6.561)	(8.969)	(8.421)	(7.492)
Constant	86.182**	82.797**	38.457***	78.380*	70.120*
	(29.763)	(28.915)	(9.949)	(33.079)	(29.169)
College Fixed Effects	Yes	Yes	Yes	Yes	Yes
N	455	296	159	134	321

Notes: Standard errors, clustered at the class level, in parentheses.
** = p<0.05, ** = p<0.01 *** = p<0.001.*

Overall, we find a positive and significant effect of the study supporter intervention on attendance (p = .006). Average attendance is on average at 60.1% for the students whose study supporter receives weekly texts, compared to 52.5% for those in the control group, a difference of 7.6 % points. In the partitioned analysis, we see that especially students enrolled on a GCSE qualification benefit from the intervention (p = .016), and those studying maths (p = .019).

VI. Pooled Analysis

Following the conclusion of both experiments, we conduct a pooled analysis across the two studies. To do so, we pool data from both studies and estimate a model identical to the main analysis of the two studies above. The results of this combined analysis can be seen below in Table 5.

Table 5: Pooled analysis of Experiments 1 and 2

	(1)	(2)	(3)	(4)	(5)
	All	GCSE	FS	English	Maths
Study Supporter	4.233**	5.956**	4.148	1.871	5.698**
	(1.464)	(1.918)	(2.596)	(2.457)	(1.806)
Gender: Male	-5.496***	-4.863*	-3.429	-8.152**	-2.015
	(1.648)	(2.032)	(2.662)	(2.547)	(2.201)
16-18 years old	3.739	8.198	-7.971	10.459	0.279
	(4.677)	(5.919)	(7.762)	(7.601)	(5.938)
Constant	93.737**	84.033**	72.190**	88.335**	65.701***
	(28.514)	(28.520)	(26.324)	(30.519)	(6.196)
College Fixed Effects	Yes	Yes	Yes	Yes	Yes
N	1476	854	390	576	900

Notes: Ordinary least squares regressions. Standard errors, adjusted for clustering at the level of the class, in parentheses. Note that columns 2 and 3 do not sum to 1476 (the total number of participants across both studies) as for some classes we are unable to determine whether participants study FS or GCSEs. **=p<0.05, ** = p<0.01 *** = p<0.001.*

Our pooled analysis suggests, in line with our previous findings, that our intervention has a positive and statistically significant effect on attendance (p = .004). Average attendance is at 58.4% for students in the control group, whereas those who were treated have an average attendance of 62.6%, or a 4.2 % point increase. It suggests that this effect is primarily driven by an increase in attendance by participants studying for GCSEs (p = .002) and for students studying maths (p = .002).

Secondary pooled analysis

As well as average effects across participants, we are also interested in whether some groups are more affected by our interventions than others. Unfortunately, the quality of recording of age and gender is low, and it is therefore difficult to consider these groups separately. However, given that our interest is primarily around participants' motivation for learning, we now consider how participants with different levels of prior motivation are influenced by the intervention. We do not have baseline measurement of either attendance, which early in a course we would otherwise use as a measure of motivation. As such, we conduct quantile regression at the 10th, 25th, 50th, 75th and 90th percentiles of the distribution of attendance, the results of which are shown in Table 6, below.

Table 6: Quantile regressions using pooled data

	(1)	(2)	(3)	(4)	(5)
Quantile	0.1	0.25	0.5	0.75	0.9
Study Supporter	3.704	3.704	1.389	0.000	0.000
	(2.818)	(2.231)	(1.839)	(1.483)	(0.344)
Gender: Male	-7.407*	-3.704	-3.704	-3.030	0.000
	(3.398)	(2.212)	(2.330)	(2.518)	(0.476)
16-18 years old	14.550	0.265	4.000	3.030	-0.000
	(8.307)	(11.668)	(5.114)	(4.301)	(2.616)
>18 years old	14.550	0.265	5.389	7.143	-0.000
	(8.445)	(11.469)	(5.256)	(3.788)	(2.347)
Constant	84.048***	94.034***	91.664***	86.537***	92.976***
	(11.026)	(13.121)	(8.157)	(5.714)	(3.779)
College Fixed Effects	Yes	Yes	Yes	Yes	Yes
Clustered Errors	Yes	Yes	Yes	Yes	Yes
Control group value	8%	40.7%	70%	85.7%	92.8%
N	1476	1476	1476	1476	1476

Notes: Analysis conducted using bootstrapped quantile regressions in Stata. 1000 repetitions. Standard errors, clustered at the class level, in parentheses. Control group values are the value for the control group at the point in the distribution to which that regression relates. ** = p<0.05, ** = p<0.01 *** = p<0.001.*

As can be seen in the table above, the overall effects of our intervention appear to be concentrated at the lower end of the distribution, among the 10th and 25th percentiles, and at the median, although these effects are not individually significant at conventional levels, while no effects are observed for participants in the 75th and 95th percentiles.

VII. Conclusion and discussion

We have conducted two field experiments that aim to test the effect of triggering social support on attendance of further education colleges in the UK. In both the experiments and in the pooled analysis of the two, we find a positive effect of our intervention, although this is not statistically significant in Experiment 1. Overall, we argue that the effect size of our intervention is substantial, amounting to an increase of 0.10 standard deviations in attendance in our pooled analysis. Chande et al. (2017) found effects on attendance over an entire school year and attainment (pass/fail) in a similar academic context, and find an increase in attendance of 0.19 standard deviations leading to an 8.7% point increase in pass rates at the final exam (although we note that in Chande et al.'s, 2015, interim analysis, the effects on attendance were more modest).

In our pooled analysis, we also find that the intervention effect is largest among participants studying for GCSE exams and not statistically significant for those studying for FS qualifications. As studying GCSEs rather than FS is not experimentally manipulated, there are multiple potential explanations for this difference. First, in most colleges the curriculum was well-defined for GCSE classes and more variable for FS classes. As a result, FS tutors were often less able to let us know when exams were happening (i.e. as these were typically spread out over a few weeks, and students within one class might be taking the exam at different times). Therefore, the exam reminder texts we were able to send out for FS classes were often less specific and perhaps therefore also less actionable for the study supporter. A second set of potential explanations lies in differences observed in our data for GCSE versus FS students. Participants studying for GCSEs are typically younger than FS students in our sample (mean age = 17.5 vs 18.4), and we might anticipate either that younger students (who, as discussed in the introduction, are likely to have previously failed these same qualifications), might be less motivated in the first place and hence have more to gain from social support. Since these students also are more likely to live at home, it is plausible that it may be more straightforward for their social support to be activated to our interventions. Additionally, GCSE students in our sample were more likely to be taking maths courses, which are also associated with a greater treatment effect, perhaps because of the intervention's capacity for combating

maths anxiety. Our sample size for this study does not permit rigorous analysis split by both GCSE status and subject. Social support has been found to buffer students from dysfunctional thoughts and anxiety (Song, Bong, Lee & Kim, 2015), and as there is a strong negative culture around maths learning among young adults on vocational courses (The Education & Training Foundation, 2014), the intervention may have helped students overcome their maladaptive beliefs about learning maths.

Although our second study and our pooled analysis yield positive and statistically significant results, it is worth considering why Experiment 1 one did not produce results that met this threshold. The variance within that sample and a higher intra-cluster correlation rate, suggest that this may in part be a result of a lack of statistical power. It should be noted, however, that the point estimate of the effect in this sample was also lower than in the other study, and so power does not appear to be the only explanation. There are a few possible explanations here. First, the overall level of attendance in Experiment 1 was higher than Experiment 2, perhaps indicating a ceiling effect. Second, we find consistently significant and positive impacts of our intervention on GCSE students (including in Experiment 1), who also make up a smaller share of the population in Experiment 1 than in Experiment 2, which could explain our results.

There are several possible explanations for the effectiveness of our intervention. The results demonstrate that text messages sent to individuals who were nominated by the student can generate improvements in college attendance. However, we cannot test whether it was an increase in perceived social support on the student's part, or an increase in monitoring behaviour on the supporters' part, or both. A previous text messaging trial with parents has found that individuals in the treatment group were 85% more likely to contact the school regarding schoolwork or grades (Bergman, 2015) than parents who did not receive text messages. Controlling (i.e. exertion of pressure through the use of commands, punishment, or coercive interactions) versus autonomy supportive (i.e. demonstrating interest, attention, praise, and reinforcement) styles of involvement are associated with different outcomes (Deci & Ryan, 1987). Rogers et al. (2009) found that supportive parental involvement was associated with higher academic achievement in children, whereas controlling involvement produced the opposite outcome. Since the study supporters' style of involvement was not measured in the present trial, we can only speculate about the behaviours they engaged in after receiving the text messages. Additionally, we may see a positive effect of the intervention because the study supporters simply passed on the information contained in the messages, rather than actively engaging in supportive behaviours such as helping with assignments or providing emotional support. The present trial design does not allow examination of these

mechanisms. Given the policy goals to improve attendance and achievement in maths and English courses at FE Colleges, it is essential to better understand the mechanisms through which personalised messages help leverage students' social support networks to improve academic motivation.

Overall, we have presented robust evidence from two field experiments that social support is effective at increasing the attendance of students at FE colleges. There remains much to learn about the underlying mechanisms of the intervention and, in particular, whether some groups find this leveraging of social support particularly beneficial and/or whether the intervention is particularly suited to some types of course or subject matter. Future studies will begin to tackle these issues.

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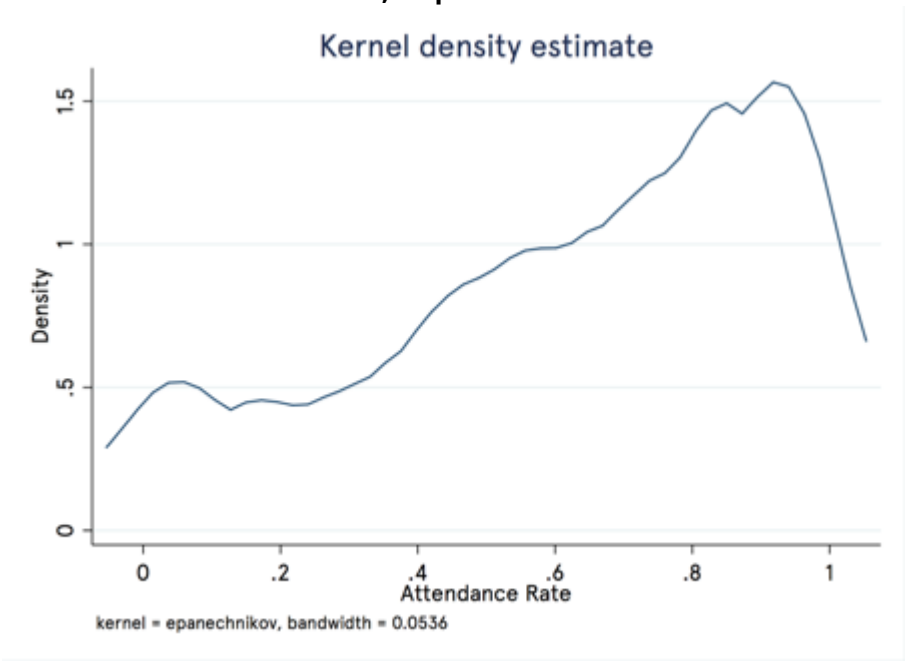
IX. Appendices

Appendix A: Distribution of Attendance, Experiment 1

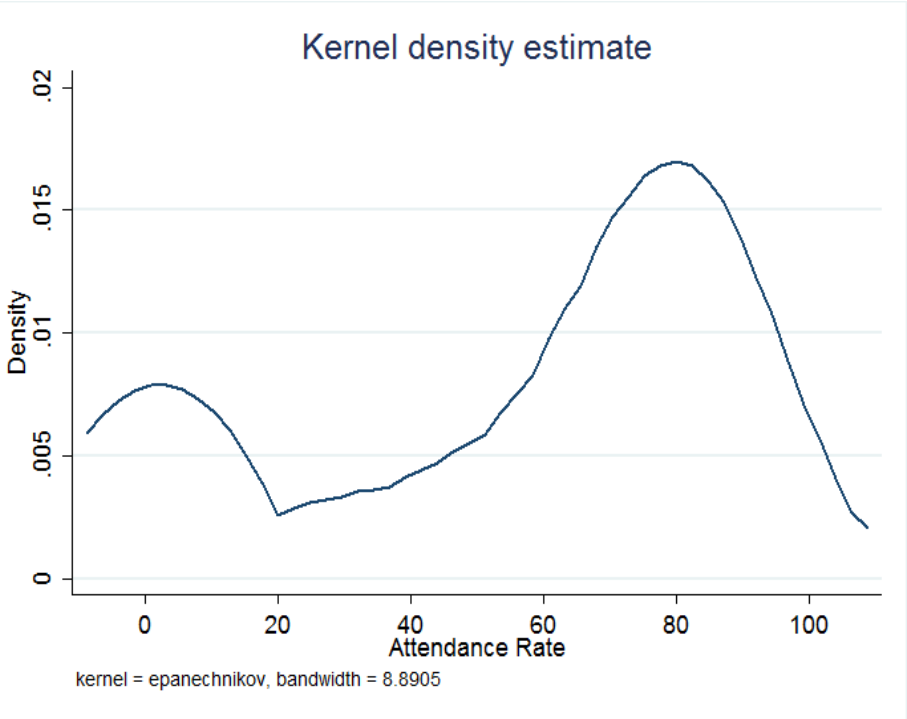


Appendix B: distribution of nominated Study Supporters, Experiment 1

Relationship	Study supporter 1		Study supporter 2	
	N	*%*	*N*	*%*
Nuclear family	422	41.33	286	28.01
Partner	56	5.48	0	0
Relative	50	4.90	66	6.46
Peer	413	40.45	401	39.28
Colleague	2	0.20	6	0.6
Professional support	25	2.45	20	1.96
Missing	43	4.2	204	19.98
Total	*1,021*	*100*	*1,021*	*100*

Notes: Nuclear family is defined as the parents or brothers and sisters of participants. A partner is defined as girlfriends, boyfriends, husbands and wives, etc. Peers are other students at the college or friends outside of college, while a colleague is someone whom they work with in a job not associated with the college. Relatives include grandparents, aunts, uncles, stepfamily and cousins, while professional support includes college tutors, social workers, and teachers from previous schools.

Appendix C: Distribution of Attendance, Experiment 2



Appendix D: distribution of subjects and qualifications, Experiment 2

	English	Maths	Total
Functional Skills	55	104	159
GCSE	79	217	296
Total	*134*	*321*	*455*

Appendix E: Distribution of relationships with nominated study supporters Experiment 2

Relationship	Study supporter 1		Study supporter 2	
	N	*%*	*N*	*%*
Nuclear family	192	44.6	153	41.6
Partner	8	1.9	5	1.4
Relative	28	6.5	33	9.0
Peer	182	42.2	160	43.5
Colleague	0	0	0	0
Professional support	9	2.1	12	3.3
Other	12	2.8	5	38.3
Total	*431*	*100*	*368*	*100*
Missing	24	-	87	-

Notes: Nuclear family is defined as the parents or brothers and sisters of participants. A partner is defined as girlfriends, boyfriends, husbands and wives, etc. Peers are other students at the college or friends outside of college, while a colleague is someone whom they work with in a job not associated with the college. Relatives include grandparents, aunts, uncles, stepfamily and cousins, while professional support includes college tutors, social workers, and teachers from previous schools.

In the cases of 'missing' , students left the 'relationship to Supporter' blank, but (1) in the case of Supporter 1, did provide us with a mobile phone number for the nominated supporter, and (2) in the case of Supporter 2, only provided details for one Supporter (and left the form for Supporter 2 blank).

Appendix F: example text messages

Subject	*Course*	*Text message content*
General	GCSE and FS	Hi [SS forename], [student forename] returned to their [English/Maths] class this week. Please ask if [he/she] has made a plan for when, where, and how [he/she] plans to study going forward. Thanks, [College]
General	GCSE and FS	Hi [SS forename], as a reminder: you are receiving this text because [student forename] picked you to be [his/her] Study Supporter. We are sending you weekly texts about how you can help [him/her] succeed in [his/her] [English/maths] class. Please have a chat with [him/her] about these topics. Thanks for stepping up when [he/she] asked for your help! [College]
Maths	GCSE and FS	Hi [SS forename], please ask [student forename] to think of something that was challenging this week and what she can discuss about it in [his/her] next Maths class. Thanks, [College]
Maths	GCSE	Hello [SS forename], please ask [student forename] whether [he/she] has completed the tasks on www.MyMaths.co.uk. Keeping up with the homework is one of the key ingredients for success! Thanks, [College]
Maths	FS	Hi [SS forename], please ask if [student forename] has already practiced using a calculator. [He/she] is allowed to use it during the upcoming maths functional skills exams. Remind [him/her] to bring it to class! Thanks, [College]
English	GCSE	Hi [SS forename], [student forename] is learning about war poetry this week. Please ask [him/her] why poems about the First World War can teach us about what 1915 was like. Thanks, [College]
English	FS	Hi [SS forename], please ask what [student forename] read over the Christmas break. What types of books does [he/she] enjoy most? Thanks, [College]