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WHY UNIONS SURVIVE:
UNDERSTANDING HOW UNIONS OVERCOME THE FREE-RIDER PROBLEM

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Why Unions Survive: Understanding How Unions Overcome The Free-Rider Problem
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ABSTRACT

This paper provides evidence for why individuals join unions instead of free-riding. I model membership as legal insurance. To test the model, I use the incidence of news stories concerning allegations against teachers in the UK as a plausibly exogenous shock to demand for such insurance. I find that, for every five stories occurring in a region, teachers are 2.2 percentage points more likely to be members in the subsequent year. These effects are larger when teachers share characteristics with the news story and can explain 45 percent of the growth in teacher union membership between 1992 and 2010.

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1. Introduction

Currently, many US States are attempting to limit the power of unions through legislative action, reducing their collective bargaining rights and ability to charge union dues. One example of these efforts is the implementation of 'right-to-work' legislation, which allows individuals to work in an industry without being required to join the union or pay dues.[1] This brings up the longstanding question: why would employees choose to pay for membership, if they can benefit from better wages and working conditions generated through collective bargaining regardless (Olson, 1965; Freeman and Medoff 1984; Bryson and Forth, 2010)? Does the rise of such legislation signal the end of trade unions?

Not necessarily. Arguments have been put forward for why individuals may continue join unions in situations where it is possible to free ride. These are reputation concerns (Akerlof, 1980; Booth, 1985; Naylor & Cripps, 1993), the appreciation of the benefits that unions provide (Jermeir et. al., 1986) and the existence of excludable benefits (Olson, 1965; Albanese and Van Fleet, 1985).[2] However, these theories have not been tested using modern empirical approaches beyond cross-sectional analysis. This paper tests that the existence of an excludable benefit can maintain, and even increase the demand for union membership in situations where individuals are able to free-ride.

Teacher trade unions in the UK offer legal protection and advice to individuals who were members at the time when the allegation was made and when it was alleged to have occurred. If the perceived risk of having an allegation being made increases, then the demand for insurance against such risks would increase. In this paper I model union membership as a form of legal insurance, which is a private and excludable benefit for members. Therefore, as the subjective perceived risk of allegations increases, the latent demand for union membership among teachers will also increase. Moreover, individuals may react to new information about allegations differently depending on how relevant they perceive it to be to their situation. Ultimately, the provision of such services means that unions could continue to exist, even if employees are not required to pay union dues.

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[1] Right-to work laws ban a particular type of employment contract that requires all employees – union or not – to pay fair share provisions, to cover the costs of negotiating and enforcing their contract. There are currently 27 right-to-work states in the US. The four most recent are Kentucky (2017), West Virginia (2016) Wisconsin (2015),. In 2018 the Supreme Court issued a ruling that government employee unions cannot require represented workers to pay a cent in union dues or fees (Janus v. AFSCME).

2 For a discussion of the categorisation of the reasons, see Chaison and Dhavale (1992).

I present a simple model where teachers have expectations regarding the likelihood of an allegation being made against them and the likelihood of being found innocent both with and without union representation. Each state of the world has an associated utility. Individuals choose between joining the union and paying their dues or not, but they receive the same wages regardless. From these assumptions I construct a series of comparative statics, showing, for an arbitrary teacher type, that the demand for union membership is increasing in the perceived risk of allegations. This model of rational decision-making forms the basis of a discrete choice estimation strategy, where individuals have expected utility from being a union member or not determined by their characteristics, idiosyncratic tastes and their perceived risk of allegations. This is directly translated into a logit model where the parameter of interest is the increased likelihood of union membership from an increase in perceived risk.

To test the model, I use the UK teacher labour market. This labour market is comparable to a right-to-work state due to the 1990 Employment Act, which made it unlawful for any workplace to exclude from employment non-union members. Additionally, UK employees are not required to pay a union, even if that union is lobbying for higher wages and working conditions in their occupation, as is the case for teachers, who agree upon wages and conditions at the national level. Despite these facts, the UK has seen an increase in union density over the last thirty years against a background of de-unionisation in the economy as a whole (Neumann and Rissman, 1984; Blanchflower and Bryson, 2008).

To examine whether this increase in union membership relates to the insurance role of unions, I require plausibly exogenous shocks to the perceived threat of an allegation being made. For this I use the number of newspaper stories concerning allegations against school teachers collected from Lexis Nexis over a twenty-year period. I exploit variation in the timing and location of these stories as exogenous shocks to the perceived threat to all teachers in that region. While I cannot observe how many or which newspapers an individual teacher reads, I assume changes in newspaper reporting reflect general changes in perceived threat, regardless of source (e.g., TV, internet, gossip). Therefore, the focus of the paper is not the impact of newspaper coverage per se, but how the perception of risk of allegations impacts union membership.

I combine this measure for perceived threat with individual level characteristics and union membership data from the Quarterly Labour Force Surveys (QLFS) between 1992 and 2010. I find that unionisation rates increase with media coverage at the regional and national level. Conditional on individual characteristics plus year and region effects, five additional

relevant news stories in a region increase the probability of union membership by 2.2 percentage points in the subsequent year. Additionally, the size of the effect is dependent on the relevance of the story to the individual teacher. Teachers from secondary schools react to stories involving other secondary school teachers, but not significantly to stories involving primary school teachers. Similarly, the demand for union membership increases amongst male teachers when there is news coverage concerning other male teachers, but not female teachers. These heterogeneous effects suggest that it is something specific about the nature of the stories driving demand and not a spurious correlation. Estimating the latent demand for union membership, I find that 45 percent of the growth between 1992 and 2010 can be explained by the increased threat proxied by media coverage.

The finding that the provision of legal services has maintained and even increased the demand for teacher unions is in itself important given the impact unions have on student outcomes. Hoxby (1996), using the passage of duty-to-bargain laws, finds that unions are effective at diverting funds to teachers by increasing their salaries and reducing pupil-teacher ratios. Accordingly, Lovenheim and Willén (2016) find that attending school in a state that has a duty-to-bargain laws reduces earnings by $800 per year and decreases hours worked by 0.5 hours per week, culminating in a total annual cost to the US economy of $199 billion.[3]

The main contribution of this paper is the establishment of a new source of demand for union representation, in the form of legal insurance. By doing so it illustrates that, despite the outlawing of 'closed-shops' in the UK, teacher unions persist and even flourish by offering and promoting a private and excludable service that is growing in demand. Previous papers have examined the excludable benefits of union membership in different forms of unemployment insurance. A set of international comparison papers have found union density to be higher in countries with the Ghent system, where unions provide finance to members during periods of unemployment, than in neighbouring countries (Holmlund & Lundborg, 1999; Clasen & Viebrock, 2008; Bryson et. al., 2011). However, the concern with such comparisons is that they are potentially confounded by other cross-country differences. Blanchflower et. al. (1990) look within a country using cross sectional data to test another form of unemployment insurance, assuming that being a member reduces the risk of becoming unemployed. They find that the

[3] Other papers have use regression discontinuity approaches to estimate the impact of union presence in private sector firms and find small impacts on business survival, employment, wages (DiNardo and Lee, 2004) and stock prices (Lee and Mas, 2012).

local unemployment rate has a positive impact on demand for union membership. This paper builds on the existing literature using repeated cross-sectional data and estimating the change in union density within UK regions over time as the perceived benefit from legal insurance changes.

While the focus of the paper is explaining the continued demand for union membership, it also adds to the growing literature on the impact of news media on individuals' expectations and decision making (see Della Vigna & La Ferrara (2015) for a review). [4] This paper contributes to the literature by showing that individuals react more according to how similar the story is to their own situation (by exploiting the characteristics of the teachers involved in each story, such as gender, school type and region).

There are two non-mutually exclusive possible channels for this heterogeneity. First, teachers are rational and react more to incidents which share their characteristics because they are indicative of an increased threat of allegations made against teachers like them in the future. Second, teachers may simply react more strongly to stories where they share characteristics as such news stories are more salient to them. I provide indicative evidence in support of the first explanation. The likelihood of a newspaper story about a *new* allegation regarding a certain teacher type increases in the number of different reported cases of that type originating in that region in the previous year. That is, if there are more cases about male teachers in the press in one year, then there are generally more new cases against males in the press the next year. This is suggestive of teachers reacting to the news reports in a rational manner, on the assumption that increased news coverage relates to increased actual threat. However, this doesn't rule out the possibility that teachers react to stories that involve teachers with similar characteristics to them due to higher salience. To understand whether the scale of the overall response reflects rational behaviour by teachers, I use data on actual allegations between 2007 and 2011 to calculate that the average teacher employed for 35 years has a 24 percent chance of having an unfounded allegation made against them.[5]

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[4] Gentzkow & Della Vigna (2010) discuss media persuasive communication where the sender has potential interest in changing the behaviour of the consumer. For the purpose of this paper, I am assuming that the newspapers themselves have no interest in the actions of teachers (aside from buying newspapers). Therefore, unlike the literature on persuasion, my focus is not on determining persuasion rates, for which I would need exposure rates.
[5] These allegation data are only available from 2007 and for a limited number of regions and therefore could not be used for the main analysis. A horserace between actual and media-reported allegations is presented in the

The policy implication is that even in a right-to-work state, the demand for union membership can still remain, if unions provide a private service that is wanted and is not readily supplied by the private market.[6] However, if a government were to provide the support to employees protecting them from allegations, this would crowd out some of the demand for union membership. Without such support, a rational action by teachers would be to join a union and be covered in the event of an allegation.

The rest of the paper is organised as follows. Section 2 provides institutional details of teacher unions in the UK, along with anecdotal evidence of the increasing demand for unions as form of legal insurance. Section 3 formalises a model for union demand dependent on perceived threat of allegation and how it relates to the econometric specification. Section 4 describes the data sources and how the media coverage data was collected. Section 5 presents estimates of the impact of media coverage on demand for union membership, presents falsification exercises and explores the impact of actual versus reported allegations. Section 6 concludes.

2. Institutional Detail

This section describes the institutional setting of teacher unions in the UK, with particular attention paid to the validity of the assumptions required for the hypothesis: that it is possible to free-ride on traditional union benefits, that unions provide a source of legal insurance, and that the demand for this service is likely to be increasing.

A: Union Membership in the UK

As with most developed countries, the UK has experienced a large decline in union membership. Total membership in 1979 stood at 13.2 million. Twenty years later it had fallen to 7.9 million (DfB, 2009). This was a combination of the de-industrialisation of the economy, technological advances automating many traditional union occupations, and policy changes (Bryson and Forth, 2010). During the 1980's the UK government passed a series of

Appendix Table 8. I find that, while the two measures are correlated, only the media reports have a significant relationship with subsequent unionisation rate.

[6] There is currently no private teacher insurance market available in the UK. The possible reasons for this are discussed in Section II.C.

Employment Acts diminishing the bargaining power of unions. Much of this legislation restricted the use of 'closed-shops,' where employers were required to employ only union members.[7] The culmination was the 1990 Employment Act, which made it unlawful for any workplace to exclude non-union members from employment, effectively making all workplaces 'open-shops.' A by-product of this legislation is that a single workplace may have multiple unions present, and it is possible for individuals to be members of more than one union should they choose to do so. It is typical for teacher unions to offer free membership while teachers are in initial teacher training and for teachers to join multiple unions only to quit them at the end of the training period.

This fall in union membership has occurred both across and within occupational groups. Over 90 percent of occupational groups have seen a fall in union membership since 1979, but some occupations have experienced a rise in union membership. The five occupations with the highest percentage point increases in union density between 1992 and 2010 are educational assistants (28.7), secondary school teachers (12.5), primary school teachers (8.5), the police (6.7) and nurses (6.4).[8] The fact that teachers were already one of the most unionised occupations makes these additional gains even more remarkable.[9] In 1993, 76.5 percent of teachers were unionised, and by 2005 this had reached a peak of 87.0 percent (10.5 percentage point gain). As Figure 1 shows, in the same period, the remainder of the UK workforce saw a 6 percentage point decline in union density.

The occupational groups that experienced an increase share a common theme of employees having prolonged unsupervised interactions with vulnerable groups. This pattern is consistent with the notion that, as society has become increasingly litigious, occupations at most risk of accusations will respond most strongly. There will likely be many repercussions on labour markets, but one rational response by employees in such occupations would be to increase their demand for insurance against these risks. In this paper I document the reaction in the UK

[7] The 1982 Employment Act banned pre-entry closed shops, and closed shops were only permitted with 85 percent support. The 1988 Employment Act outlaws industrial action to establish or preserve closed shops and gave union members the right to ignore strikes.

[8] Author's calculations are based on the QLFS of all three-digit occupational groups with at least 100 employees per year. The unionisation rate amongst the clergy also increased rapidly, reaching a peak in 2005 of 14.3 percent, up from a base of 2.8 percent in 1992, but had fewer than 100 observations for 5 of the 18 years.

[9] Educational assistants from 20.4% to 48.1%, secondary school Teachers from 76.1% to 88.6%, primary school Teachers from 82.3% to 90.8%, police from 76.8% to 83.5%, and nurses from 79.2% to 85.6%.

teacher labour market, as it is a well-defined occupational group with a large number of employees that has also received considerable press attention regarding allegations over the last two decades.[10]

B: Teacher Unions in the UK

Teacher unions have representatives in schools to defend the contractual working conditions of all teachers at the school level. Negotiations regarding teacher pay, pensions, and contractual conditions (e.g. hours worked, curriculum, pupil teacher ratios), however, are held at the national level. This means that it is impossible for unions to bargain only for their members, as non-union teachers employed in public sector schools will also receive any gains. Despite being able to gain from the union negotiations, non-members are not required to pay union dues.11 These factors make the UK teacher labour market a classic example of the trade union free-rider problem: why would teachers choose to pay the costs of union membership if their pay and working conditions are determined centrally? This is reflected summary statistics from the QLFS. Since 2001, only 75 percent of teachers thought their pay and working conditions were affected by trade unions, but more than 87 percent of teachers were union members.[12] There must be other benefits from being a union member.

C: Unions as an Insurance Provider

A rational explanation for some teachers being union members despite being able to free-ride on union negotiated pay and conditions (or even if they think unions provide no such benefits), is that teacher unions provide other benefits that are excludable to non-members. One such

[10] Some occupations are required to purchase indemnity insurance through joining a professional body. UK doctors are required to become members of the British Medical Association, which is the registered trade union for doctors. Physiotherapists and Radiologists each have a professional body which provides insurance coverage as well as professional and legal advice (Royal College of Radiologists, and Chartered Society of Physiotherapy).
[11] Union dues are set by each union at a national level, in contrast to some other countries where the level of dues reflect the bargaining power at the local (school/district/state) level. There is a regional pay scale to account for the cost of living around London, but this differential is still negotiated at the national level. The annual membership fee for a full time teacher in 2015 for the two largest teacher unions in the UK were £167 NASUWT and £170 NUT, and have been constant in nominal terms since 2010.
[12] One reason for not all teachers saying that their pay and conditions are affected by unions is that, since the dissolution of the Burnham Committee in 1986, teacher unions no longer had a seat on the teacher pay committee. This was replaced by the School Teachers Review Body (STRB), which is made up of academics and professionals who make pay recommendations to the government. Unions can submit evidence to the STRB but do not hold a seat.

benefit, which is highly promoted by the unions, is the legal advice and protection provided in the event of an allegation being made.[13] Teachers who are union members when the allegation is made and at the time of the alleged incident receive an official representative for the internal disciplinary meetings and legal representation in the event of an escalation.

The teacher trade unions consider this service to be the major driver of union demand.[14] As part of the terms and conditions of membership, many unions reserve the right to use the facts of successful cases to publicise their criminal representation scheme (NASUWT, 2014). Moreover, in a survey of 176 teachers that I conducted in 2010-11, I found that in answering the question *"What were the MAIN reasons why you initially joined a teacher union?"*, 85 percent of the respondents stated *"support in the event of allegations from pupils"* compared with 56 percent saying "*to improve terms and conditions*" (Appendix Table 1).

There are currently no private insurance companies offering legal insurance to teachers in the UK.[15] This begs the question, if there is a demand for private legal insurance, why doesn't a market exist in which teachers can buy the service without the additional bundled costs involved with union membership? There are two likely reasons. First, were an insurer to enter into the market where the only benefit was risk insurance, it would risk adverse selection of consumers. The unions currently in the insurance market have a first mover advantage, in that they have a large non-negatively selected pool of enrolees because they also offer benefits that are not related to insurance (e.g., information on teaching practice and conforming to social norms). Second, the regulations regarding internal school hearings prevent teachers from employing representation for themselves. The only forms of representation a teacher is allowed at these hearings are themselves or a union representative/attorney. Note that a corresponding situation exists in the US, where union members have 'Weingarten Rights,' meaning that they can request union representation at meetings that could lead to disciplinary action.[16] In either

[13] Other excludable benefits offered by teacher unions include continuing professional development, group discounts, social status, and contributing to the union movement.
[14] Paddy Marshal, Head Recruitment Officer NUT, in April 2009 stated in a phone interview in relation to the legal insurance that "the safety net is the biggest potential benefit." Tracy Twist, Assistant General Secretary of NASUWT stated in a meeting with me that "a lot of teachers join because of these concerns."
[15] Ascertained by requesting these services over the phone from the top five insurance companies (AIG, Aviva, RSA, AXA, Direct Line) in the UK, each year from 2011-16.
[16] These rights have existed since a 1975 Supreme Court case National Labor Relations Board vs. Weingarten (Brennan & Supreme Court of The United States, 1975). Non-union employees have no equivalent rights. In 2000, non-union employees were allowed to have co-workers in such meetings but "do not have the right to legal

country, teachers can still employ a lawyer if the incident proceeds beyond internal disciplinary matters. However, in both countries, union membership comes with access to legal counsel and liability coverage.[17]

If the internal hearings deem the situation serious enough to warrant external authorities, either the police of the General Teaching Council (GTC) would be informed. In criminal cases this would be the police. Teachers found guilty of one of 42 offences, such as indecent assault on a child under 16, are automatically put on *List 99*. This prevents the individual from ever working or volunteering to work with young people. For less serious cases teachers can be referred to the GTC, which would convene a panel consisting of two teachers, one lay member and a legal representative. Teachers found guilty of professional misconduct here can also be added to the list if the offence is deemed grievous enough. Examples include falsifying qualifications and assisting students with exams. In either case teachers can pay for their own legal representation, but these costs are not refundable even with a not guilty verdict. As a result, many teachers choose to be represented by trade unions.

D: Nature of the Risk

For the fear of allegations to explain the rise in demand for union membership, the threat of allegations also needs to have risen over this time period. There are no comparable records directly measuring the threat of allegations annually. However, the largest union in the UK (NASUWT) reported dealing with 71 cases of alleged sexual or physical abuse in 1991, 134 in 1992 and 158 in 1993 (Independent, 1994) and then estimated dealing with 800-900 per year in 2009 (Keates, 2009).[18]

To obtain a more detailed and comprehensive measure of the threat against teachers, I use the number of national newspaper stories involving accusations of teachers. A detailed explanation of how this number is generated is provided in Section 4. There has been a large increase in the number of newspaper stories concerning allegations against teachers over time.

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counsel, union representatives, or other individuals who are not co-workers," and even these rights were rescinded in 2004 (IBM, 2004).

[17] For example, the California Teachers' Association provides $1,000,000 coverage for legal defence costs in civil suits arising out of educational employment activities and up to $35,000 reimbursement of attorney fees and costs to defend employment-related criminal proceedings (CTA, 2019).

[18] NASUWT membership over this period increased by 63 percent (Certification Office, 2010) whilst the number of allegations against its members increased by 1,167 percent.

Figure 3 shows that between 1992 and 1998 the average per year was 6.6, increasing to 37.9 in the period 1999 to 2005. Post 2005, there was a fall in the number of news stories in national newspapers. This coincides which a change in the law which gave more protection to teachers to prevent their case from being reported before a case had gone to term (HM Government, 2006).[19]

Would a fear of allegations be rational for a teacher working in the UK today? To establish this basic tenet, I collected information on the actual allegations made against public sector employees who work with children and young people through use of the Freedom of Information Act. After contacting all 152 Local Authorities in England, I received responses from 118 (See Appendix 1 for detailed list). Unfortunately, it was compulsory only for Local Authorities to record this information from 2007 to 2011, and therefore the data span a relatively short period of time.

The information received included which occupational sector the allegation was made against and the nature of the allegation.[20] The education sector received more than half of all allegations, with 52.6 percent despite representing only 42 percent of the workforce that work with children and young people (DCSF, 2008). Of these allegations, 56.9 percent are physical in nature and 23.9 percent sexual, which is comparable to allegations for all non-educational occupational groups with 52.5 percent and 25.1 percent, respectively (Table 1). These data also provide a count of the outcomes of allegations over the previous twelve months, which I have codified into four categories: (1) Not Upheld, (2) Police Involvement, (3) Disciplinary Procedures and (4) Referral.[21] These outcomes cannot be connected to occupations, but in general 46.1 percent of all allegations are not upheld (Table 2).

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[19] In accordance with the Association of Chief Police Officers (ACPO) guidance, the police will not normally provide any information to media that might identify a teacher who is under investigation, unless and until the person is charged with a criminal offence. In exceptional cases where the police might depart from that rule (e.g., an appeal to trace a suspect), the reasons should be documented and partner agencies should be consulted beforehand.

[20] There are 15 occupational groups: Social, Care, Health, Education, Foster Carers, Connexion, Police, YOT, Probation, CAFCASS, Secure Estate, NSPCC, Voluntary Youth Organisations, Faith Groups, Armed Forces, Immigration/Asylum Support Services, and Other. There are five abuse categories: Physical, Emotional, Sexual, Neglect and Other.

[21] The 16 outcome categories are: Not Upheld – *No further action after initial consideration, Being unfounded, Being unsubstantiated, Being malicious, Acquittal*; Police Involvement – *Criminal investigation, Conviction*; Disciplinary Procedures – *Disciplinary Action, Suspension, Dismissal, Resignation, Cessation of use, Inclusion on barred/restricted employment list*; Referral - *Section 47 investigation, Referral to DCSF, Referral to Regulatory Body*.

To obtain a measure of actual threat, I calculate the number of allegations per teacher per year in the responding Local Authorities using total teacher employment taken from the School Workforce in England (2011). In 2007, this figure was 1.49 allegations per 100 teachers per year and had marginally increased to 1.5 by 2010. Combining this with the proportion of allegations that are not upheld, I derive an approximate objective measure of risk of a teacher having a non-upheld allegation made against them. Assuming that these allegations are evenly concentrated over teachers and over time and that 46.1 percent of allegations are not upheld, an average teacher over a career of 35 years can expect a 24.2 percent chance to have a non-upheld allegation made against them. This one-in-four chance of a non-upheld allegation provides credit towards the notion that teachers are reacting to a credible threat and not acting irrationally. This is especially true given that to be covered a teacher needs to be a union member at the time of the alleged allegation and when the allegation is made. As union dues and the decision to remain in a union are made on an annual basis, the annual probability of a non-upheld allegation being made is 0.69 percent.

3. Demand for Union Membership Model

A: Model and Assumptions

Teacher unions provide a unique service in the form of legal advice and protection against allegations made by students. I model union membership as form of legal insurance that teachers can chose to pay for with annual dues. The benefit is that the expected outcome in the event of an allegation is better if the teacher is a member of a trade union. The framework is parallel that of Blanchflower et. al (1990) who model union membership as a form of unemployment insurance.

To formalise this decision process, the following assumptions are made. There are multiple types of teachers that vary in their risk aversion, their actual risk of allegations being made against them and other characteristics that are correlated with the net benefits of union membership. All of these teacher types are summarised by a term θ.[22]

A teacher's utility is a function of consumption income Y and type θ, $U(Y, \theta)$, which has decreasing marginal benefits from income. Teachers are employed in schools which are 'open shops,' so union and non-union members are both employed and earn the same wages $w > 0$.

[22] Note that this allows for some types of teachers to potentially commit offences. If all teachers were innocent all the time, there would be no market for insurance as all teachers would be presumed not guilty.

There is only one trade union, and, if a teacher decides to join the union, she pays annual cost c>0. Therefore, teacher wages can either be spent on union fees or left as consumption income, $w = Y - c$.

If an allegation is made against a teacher, the teacher incurs cost $a > c$ regardless of the subsequent outcome, reflecting the social costs and potential damage to career prospects. Similarly, there is an additional cost l if a teacher is found guilty of an allegation such that $l \gg c$, reflecting the high cost of being put on List 99 or for more serious offences being imprisoned. We can now rank utilities for any given state of the world for all types θ:

$$U^n(w,\theta) > U^u(w-c,\theta) > U^{nw}(w-a,\theta) > U^{uw}(w-a-c,\theta) > U^{nl}(w-a-l,\theta) > U^{ul}(w-a-c-l,\theta) \quad (1)$$

where U^n and U^u are the utilities of non-members and members respectively with no allegation against them. The second superscript relates to the outcome of the allegation: U^w is the utility after winning a case; U^l, losing a case. These utility levels depend on union status. For union members, $U^{uw} = U(w-c-a,\ \theta)$ and $U^{ul} = U(w-c-a-l,\ \theta)$. Non-union members utilities U^{nw} and U^{nl} follow a similar structure but do not incur membership cost c. Therefore, the state with the highest utility is a non-member with no allegations against them U^n and the worst state is a union member who lost their case U^{ul}.

The teacher type θ can contain a taste for investing in a public good, such as union membership, independent of the allegation threat. For simplicity, I assume tastes for union membership cannot be large enough to change the direction of these preference inequalities.

The perceived subjective probability of an allegation being made against a teacher with characteristics x from region j in year t is $\delta(s_{xjt-1})$. This an increasing function of previous news stories s in the first derivative and negative in the second, reflecting the diminishing marginal impact of the news stories in a region.[23] By having δ be a function only of news stories and not current union membership, I assume that there is no strategic behaviour by the accuser (e.g., being less likely to accuse a union teacher), as students will not likely know the union status of any given teacher.

[23] The perceived threat can also be a function of other factors in addition to news stories, such as the actual number of allegations. Section 5.4 investigates the use of this and other less salient measure of threat. Imposing a linear relationship between news stories and the decision to join a union provides qualitatively similar results.

If an allegation is made, the probability of a teacher being exonerated is $r(x)$ which is increasing in the amount of resources devoted to their defence *x*. Therefore, the expected utility of a teacher once an allegation is made, Z, is a convex combination of winning and losing utilities given their union membership status.

$$Z^n = r(x^n)U^{nw} + (1 - r(x^n))U^{nl} \quad (2)$$
$$Z^u = r(x^u)U^{uw} + (1 - r(x^u))U^{ul}$$

The individual teacher has only one decision to make: to join the union or not. A marginal individual of type θ^* is indifferent between joining a union or not, and so have no marginal benefits of joining: when $b = 0$.

$$b = EU(membership) - EU(nonmembership) = 0$$
$$b = \left[\delta(s)Z^u + \big(1 - \delta(s)\big)U(w - c,\ \theta^*)\right] - \left[\delta(s)Z^n + \big(1 - \delta(s)\big)U(w,\ \theta^*)\right] = 0 \quad (3)$$

For a marginal member to exist, it must hold that that the expected utility, once an allegation is made, is greater for a union member than for a non-union member ($Z^u > Z^n$), as $U(w - c,\ \theta^*) < U(w,\ \theta^*)$, and $\delta(s)$ is independent of membership status. This provides the first implication of the model. Since the only difference between Z^u and Z^n comes from $r(x)$, if there are any union members, then we require that unions provide more resources for defence $r(x^u) > r(x^n)$. This result reflects the restrictions that exist for teachers in employing private representation, making it difficult to transform income into defensive resources efficiently.

Taking the first derivative of (3) with respect to the number of news stories, it can also be shown that the expected gain from membership for the marginal member is an increasing function of news reports.

$$\frac{db}{ds} = \delta'(s)(Z^u - Z^n) + \delta'(s)[U(w,\ \theta^*) - U(w - c,\ \theta^*)] \quad (4)$$

Given the assumptions that $\delta'(s) > 0$, $Z^u - Z^n > 0$ and $(w - c,\ \theta^*) < U(w,\ \theta^*)$, it follows that $\frac{db}{ds}>0$. For an indifferent teacher with taste for risk θ^*, the marginal benefit of unions is increasing the number of news stories.

B: Comparative Statics

I now present comparative statics to illustrate that a teacher of type θ^* would choose to be a union member when the perceived risk of an allegation is high, but not when the perceived risk is low.

Panel A of Figure 2 shows her utility function, $U(Y, \theta^*)$, and the utility levels specified in (1). A teacher will make her decision by evaluating her utility if no allegations are made, her expected utility if an allegation is made, and the probability of that allegation being made in the first place. The expected utility of a union member once an allegation has been made is represented by the chord linking the points U^{ul} and U^{uw} (similarly for the points U^{nl} and U^{nw} for non-members). The exact point on the chord is determined by the probability of success, $r(x)$. As $r(x^u) > r(x^n)$, the union member will be higher up their chord than the non-union member, so we can plot $Z^u > Z^n$.

A union (non-union) teacher will compare their outcomes should no allegation be made $U(w - c, \theta^*)$ ($U(w, \theta^*)$) to her expected utility in the event of an allegation Z^u (Z^n). Therefore, the expected utility before an allegation is made is a combination of these two outcomes. These combinations for union and non-union members can be seen in Panels B and C of Figure 2. The lower chord that links the intersection of the utility curve with Z^n to the intersection with w represents the expected utility space of a teacher who is not a union member. Similarly, before an allegation is made, a union teacher is at a point on the upper chord between $U(w - c, \theta^*)$ and Z^u.

The location of a teacher along this new chord is dependent on her expectations of an allegation being made against her. Panel B of Figure 2 shows a high threat scenario, $\delta(s)$=0.5, and the individual will be at the midpoint of each chord. With this high perceived threat level, the expected utility from membership is greater than that of non-membership, $EU^u > EU^n$. In contrast, Panel C shows that the same teacher with the same taste for risk and type θ^* and same amount of union dues *c* would choose not to be in a union if the risk level were low, $\delta(s)$=0.1. This basic example demonstrates that the demand for union membership is directly related to the perceived threat of allegations, $\delta(s_{xjt})$.

C. Econometric Specification

This basic model of rational decision making by the teacher forms the basis of the estimation strategy. A teacher *i* from region *j* in time period *t* will choose to join the union if the expected benefits of joining the union are positive: $EU^u_{ijt} - EU^n_{ijt} > 0$. Each of these expected utilities will be a function of many factors in addition to perceived threat of an allegation being made and will be related to the teachers type θ. This can be summarised by the two following equations.

$$EU_{ijt}^{u} = \alpha^{u} + \rho^{u}\,\delta(s_{jt-1}) + \gamma^{u}X_{ijt} + \mu_{j}^{u} + \omega_{t}^{u} + \varepsilon_{ijt}^{u} \quad (5)$$

$$EU_{ijt}^{n} = \alpha^{n} + \rho^{n}\,\delta(s_{jt-1}) + \gamma^{n}X_{ijt} + \mu_{j}^{n} + \omega_{t}^{n} + \varepsilon_{ijt}^{n} \quad (6)$$

where $\delta(s_{jt-1})$ is the perceived threat in region *j* in time period *t* caused by news stories *s* in the previous period. The expected benefits for a union member per unit of perceived threat is represented by ρ^{u}. The remaining parameters account for the other characteristics of a teacher type θ. The general benefits for being a union (non-union) member for any individual in any time period is α^{u} (α^{n}). The benefits of union (non-union) membership can also vary according to a vector of observable individual characteristics X_{ijt}, such as age, qualifications, sector of employment and gender. The additional gains for being a union member in region *j*, are represented by μ_{j}^{u}, which could reflect taste for unions in a particular region. ω_{t}^{u} allows for varying gains from union membership each year, which impacts all teachers in the same way, such as any general decline in union power. Individuals also have an idiosyncratic taste for union (non-union) membership that varies overtime, ε_{ijt}. The probability that any individual *i* in region *j* at time period *t* will be a trade union member is $Pr(EU_{ijt}^{u} > EU_{ijt}^{n})$, using the standard result (McFadden, 1976) we can combine equations 5 and 6 into the following expression:

$$Pr(EU_{ijt}^{u} > EU_{ijt}^{n}) = \frac{\exp(\alpha+\rho\delta(s_{jt-1})+\gamma X_{ijt}+\mu_{j}Region_{j}+\omega_{t}Year_{t})}{1+exp(\alpha+\rho\delta(s_{jt}-1)+\gamma X_{ijt}+\mu_{j}Region_{j}+\omega_{t}Year_{t})} \quad (7)$$

where each parameter is now the marginal benefit for individual *i* to join the union (e.g., $\rho = \rho^{u} - \rho^{n}$). As I do not have a measure of perceived risk, only the incidence of media stories, I am not able to separately identify the perceived threat from each story δ and the marginal gain ρ from a unit of perceived threat. Instead, I will estimate the combination of the two, the expected marginal gain for union members per story.

Given that, by assumption, $\delta(s_{jt-1})$ is decreasing and concave, it will be parameterised into the effect per story β_1, and its square β_2. The demand for union membership can then be estimated using a logistic regression, where the parameters of interest are $\beta_1 + 2\beta_2\overline{s_{jt-1}}$ representing the marginal effect of an additional story at the mean news coverage on union membership, of the form:

$$U_{ijt} = \alpha + \beta_1 s_{jt-1} + \beta_2 s_{jt-1}^{2} + \gamma X_{ijt} + \mu_{j} + \omega_{t} + \varepsilon_{ijt} \quad (8)$$

where U is an indicator variable if individual *i* in period *t* is a union member or not, and s_{jt-1} is the number of stories in region *j* in time period *t-1*. I include a series of regional and year fixed effects, μ_j and ω_t respectively. This specification assumes that media coverage of region j has no impact on the perceived benefits of union membership in a different region. To allow for correlation in the residual demand for union membership, the standard errors throughout the paper are clustered at this regional level.[24] To allow for spillovers and to obtain estimates of the total impact of news stories on union membership, I will estimate an alternate specification which additionally includes a measure for total news stories nationally each year, s_t, and replace the year effects term with a national time trend φ:

$$U_{ijt} = \alpha + \beta_1 s_{jt-1} + \beta_2 s_{jt-1}^2 + \beta_3{}^{Nat} s_{t-1} + \beta_4{}^{Nat} s_{t-1}^2 + \gamma X_{ijt} + \mu_j + \varphi Year_t + \varepsilon_{ijt} \qquad (9)$$

Following similar reasoning that teachers are more likely to be affected by news stories originating in their region, one may expect certain stories to have a larger impact on certain teachers who share characteristics with the teacher involved in the media coverage. For example, a news story involving false allegations against a male teacher may be more relevant to other male teachers compared to female teachers. I investigate this by allowing the threat to vary by the characteristics of the teacher in the story s_{xjt} and estimate the impact when the characteristics of the teacher are the same or different to the characteristics of the story, $X_{ijt} = X_{sjt}$ and $X_{ijt} \neq X'_{sjt}$. Any differences in the effect may be due either to the threat of a given story generates being greater, $\delta(s_{xjt-1}) > \delta(s_{x'jt-1})$ when $X_{ijt} = X_{sjt-1}$ and $X_{ijt} \neq X'_{sjt-1}$, or to the expected marginal gain driven by the story being larger, $\rho_{X_{ijt}=X_{sjt-1}} > \rho_{X_{ijt}\neq X_{sjt-1}}$. Again, I cannot separately identify these effects but will instead estimate the marginal effect of a similar or less similar story as follows:

[24] Due to the relatively small number of regions (20), there is reason for concern due as the standard cluster robust variance estimator (CRVE) is based on the number of clusters going to infinity. A typical solution would be to use wild cluster bootstrap (Cameron et al., 2008). However, Kline and Santos (2012) state that this is not appropriate when implementing maximum likelihood estimation, and propose a score-bootstrap to be used in its stead. A follow-up paper by Roodman et. al. (2018) claims that this score-bootstrap cannot fully capture the nonlinearity of the estimator in nonlinear models and suggest that "score-bootstrap not be relied upon without evidence that it works well in the case of interest." Therefore, I have replicated the main results with score-bootstrap p-values and found that it leads to very similar results, indicating that the inference using CRVE is robust (Appendix Table 3).

$$Union_{ixjt} = \alpha + \beta s_{ix'jt-1} + \beta s^2_{ix'jt-1} + \gamma X_{ijt} + \mu_j + \omega_t + \varepsilon_{ijt} \quad (10)$$

Data and Descriptive Statistics

A. Union Membership

Information on teachers and their union status is obtained from the Quarterly Labour Force Surveys (QLFS) over the period 1992 through 2010. The QLFS is conducted by the Office of National Statistics and follows approximately 60,000 households every quarter. Individuals are asked for employment and personal characteristics. This allows me to condition on factors that have been shown to be important determinants of union status (Machin, 2006): age, tenure, gender, occupation, public sector employee, qualifications and region. Information relating to union membership is collected only in the autumn quarter, so only observations from this quarter can be used.[25] The estimates are generated over the period 1993 to 2010, as some individual characteristics are not available in 1992.

Teachers are identified through three-digit occupation codes, which allows teachers who work in primary schools, secondary schools and Special Schools to be separately identified. This results in a final sample used for estimation of 30,392 teachers, with on average 1,782 teachers per year, 827 of whom teach at primary schools, 817 teach at secondary schools and the remaining 138 teach at specialist schools. Summary statistics of teachers in comparison to the workforce in general can be found in Table 3. As one may expect, teachers differ considerably, 88.6 percent are employed in the public sector compared with 24.6 percent in the wider economy. Teachers are also more likely to be female (72.5 percent versus 47.5 percent) and be a graduate (74.3 percent versus 18 percent). Regarding the main characteristic of interest, the unionisation rate of teachers is 84 percent compared with 27.6 percent for non-teachers and 59.4 percent in the public sector as a whole. This paper uses the twenty detailed Government Office Regions as the region of analysis, which is derived from Local Authority

[25] The QLFS is a continuously rotating panel of households interviewing over five quarters, and information relating to union membership is obtained every autumn. Therefore, a quarter of individuals are asked twice about their union status. Unfortunately, the number of repeated teacher observations is too small to run auxiliary analysis on this sample. The standard errors are clustered at the regional level and no teacher in the sample is observed changing regions between surveys.

residence. These larger regions allow for news stories to have wider impacts outside of their immediate vicinity.[26]

B. Media Coverage

Many different factors may influence the perceived threat of an allegation being made against a teacher. This paper uses the impact of media coverage originating in the region in which teacher *i* resides as a measure for overall threat. In order for this to be exogenous, I require two assumptions.

First, the impact of moral hazard of teachers committing more incidents when being a union member cannot be sufficient to generate an increase in the number of news stories. Workplace health insurance schemes have been found to illicit moral hazard by workers (Kruger, 1990; Meyer et. al., 1995). One may hope that the actions of teachers would not be reactive, but, for the number of news stories to remain exogenous, we would only require the weaker assumption of the incidents of news stories not changing. Therefore, the main measure is only going to count coverage where the teacher is found to be innocent and so could not be driven by moral hazard. Second, areas with high union density cannot be more likely to generate news stories. Without these assumptions, the incidence of media reports is endogenous, as higher union membership would increase the number of stories. These assumptions are tested by means of an event study in the robustness section, where failure would result in increases in the likelihood of membership before the news story event.

It would be very difficult to have a measure of all news coverage. Therefore, like other papers (Carroll, 2003; Lamla and Lein, 2008; van der Wiel, 2009), I will be using the number of articles in national newspapers as a proxy for all media coverage. The data on news stories is obtained from LexisNexis, an online database of media published in the UK. In order to have a consistent measure of press coverage, only newspapers that were present in LexisNexis throughout the entire period were used for the analysis.[27] I searched for all articles which contained the word 'teacher' in the headline and included any of the following terms (or

[26] Use of the restricted access QLFS with Local Authority information is not possible before 2002. These files have been converted to the new calendar framework and as union questions were only asked in the Autumn they have been removed.

[27] Newspapers that were omitted due to only appearing for part of the sample period were: The Morning Star, The Express, The Daily Telegraph, Sunday Express, Sunday Telegraph, The News of the World, and The People. Their exclusion does not change the interpretation of the results. Results are available upon request. This also prevents the use of local newspapers, as they only started appearing in the LexisNexis data from 2002, and not consistently across regions.

derivatives) in the headline or preliminary paragraphs of the main text (as defined by Lexis Nexis); *teacher, damages, sued, litigation, allegation, jail, court, dismissed* or *fired*, over the period September 1991 to August 2010. Using the date of the QLFS interview and media publication date, I allocate media coverage from the twelve months prior to the interview to the teacher. The length of this recall period is varied in the robustness section.

Each of these news stories were categorised by rubric (a full description of the categories can be found in Appendix Table 2). This coding frame classified news stories into four levels according to how relevant they would be to influence a teacher's perceived benefit of joining a union: Extremely Relevant (e.g., teacher found innocent and case thrown out of court); Highly Relevant (e.g., a teacher currently on trial); Little Relevance (e.g., guilty of a lesser offence); Not Relevant (e.g., teacher admits guilt of extreme sexual abuse). This effectively means that the more "relevant" articles are measures of less bad behaviour (or no bad behaviour at all), but are "relevant" to someone who worries that they might be falsely accused. Moreover, counts of relevant stories would not be impacted by moral hazard by teachers. In contrast, stories involving teachers admitting bad behaviour are coded as low relevance, including any moral hazard on behalf of teachers. Note that it is possible for a single case to appear in different levels as the newspaper stories develop over time. In total, 1,709 stories were coded, of which 623 were classified as extremely relevant and 548 as highly relevant. To limit the subjective nature of classifying the news stories, I follow Woolley (2000) in pre-defining the rubric before the search was conducted.

The newspaper stories are further categorised by story type according to whether they involve: *Allegations, Being Sued, Suing, Being Attacked, Criminal Activity, Being Sacked, Employment Tribunal* and *Teacher Union Activity*. For the main analysis, I define an accusation story to be one of the following story types *'Allegations', 'Being Sued',* and *'Criminal Activity',* with parallel analysis using all story types. The total number of stories of this type in the balanced panel of newspapers that are extremely or highly relevant is 439. Table 4 summarises the total number of stories by level and type. Figure 3 shows the large increase in the number of news stories since the late 1990's, alongside the growth in union density.

In addition to the relevance and nature of the news stories, I also extracted information on the type teacher involved in the story and its region of origin (Table 5). The name of the teacher, or pronoun used in each story was used to determine the gender of the teacher. References to the school name or the age of the pupils involved determined if the teacher was teaching in a Primary or Secondary school. In this way I was able to assign gender in 96.6% of stories and

school level in 82.4% of stories. For stories where the gender or school level of the teacher were not mentioned, the story was not counted for either group. Stories where no region is mentioned are counted only towards the total number of stories nationally; 82% of these stories are trade unions highlighting the growing issue of false allegations being made against teachers. Stories involving secondary school teachers are the most common, representing 66.3% of highly relevant stories. The balance between the genders is more equal with 50.7% of highly relevant stories involving male teachers and 46.5% involving female teachers.

4. Results

A. Aggregate Trends

Between 1993 and 2005, the union density amongst teachers increased by 10.5 percentage points, whilst amongst non-teachers it fell by 6 percentage points (Figure 1). This increase in unionisation rate has occurred across all teacher age groups, which implies that this growth rate is not solely due to improvement in recruitment rates amongst newly qualified teachers but a general increase in demand for union membership across all teaching age groups (Appendix Figure 1). Union density started to decline after the government restriction on media reporting in 2005 (Figure 3). This decline was not reversed with the increase in unemployment rate associated with the Great Recession from 2008 onwards, which would be expected if individuals joined unions as a form of unemployment insurance Blanchflower et. al. (1990). In summary these aggregate trends are indicative that there has been a general increase in demand for union membership among teachers since 1993, which peaked in 2005 and trends with the number of news stories nationally.

B. Main Results

We now turn to analyse the aggregate trends of Figure 3 through the regression framework developed in Section 3. The basic estimating equation is given by specification (8). I use the number of national news stories that originated in a region from the previous twelve months as a shock to the perceived threat of an accusation being made. These within-region logistic estimates are presented in Table 6. To aid interpretation, the estimates have been transformed from the logistic parameters to the marginal effect multiplied by 100, and so can be thought of as a percentage point change in probability (e.g., a coefficient of 0.5 would reflect a half a percentage point increase in the probability of union membership).

Column 1 of Panel A shows a positive significant raw correlation of 0.548 between the number of extremely relevant stories involving an accusation originating in a region on the likelihood of union membership. Column 2 conditions on individual characteristics, with little change in the coefficient which implying that there is little correlation between the incidence of news stories and these characteristics (0.588). Column 3 additionally allows for varying union demand in each region and is therefore using the within region variation in news stories over time. The final column additionally includes year effects which allows for the average unionisation rate to increase over time, which is the smallest of the estimates at 0.502 but remains significant at the 5 percent level.

The quadratic term is negative and significant, implying that each additional story beyond the first has a smaller impact. Evaluating the marginal effect at the mean, I find that each additional highly relevant story increases the probability of being a union member by 0.425 percentage points. Panel B shows the same specifications on the same sample, but uses both extremely and highly relevant stories, instead of just the most relevant. The coefficients do not change significantly, but, due to the additional variation, the standard errors are smaller. Therefore, all remaining analyses employ this measure of relevant stories.[28] [29]

The final panel of Table 6 reports the impact of stories relating to teachers defined as having little to no relevance for an innocent teacher on union membership. This serves two purposes. First, one may be concerned that these effects could be a spurious correlation between the number of stories about teachers generally in a region and union status. Second, insurance from allegations means there is the possibility of moral hazard among union teachers with malevolent preferences. However, the rubric codes stories of teachers found guilty of an allegation to be of Little to No Relevance. Therefore, testing for a relationship between union membership and the number of low relevance stories is approaching a test for moral hazard.

[28] I have run a parallel set of estimations which instead use a measure of news impact, derived from the number of words per story normalised by mean story length in that newspaper in that year. These results mirror these findings and are available upon request.

[29] As described in Section 3, I allow for a decreasing marginal impact of stories through the inclusion of a squared term. This is important as there are a handful stories that created a large amount of national press coverage over the course of a year, producing media counts more than two standard deviations above the mean. Appendix Table 4 presents estimates from five different functional forms for media coverage; linear; linear capped at the 95% percentile; inverse hyperbolic sign (which approximates to logarithmic but can include zero), capped inverse hyperbolic sign, and quadratic. With the exception of the uncapped-linear specification all the specifications are positive significant and not statistically significantly different from each other at the 95 percent level. This highlights the importance of not enforcing constant impact of media coverage.

Reassuringly, Panel C of Table 6 shows no relationship between stories of Little to No Relevance and union membership.[30]

These estimates do not capture the total impact of news stories annually on national membership, as they are using the variation at the regional level whilst accounting for national year effects. This is estimating only the relative effect of a news story originating in that region compared to other regions. To obtain a national impact, I replace the year effects terms with a national linear time trend. The total number of stories nationally per year parameter reflects the additional growth due to media coverage in excess of the long run unionisation trend. The corresponding estimates are found in Table 7. The number of the most relevant stories nationally has an additional impact above and beyond the number of regional stories, although the impact is smaller (0.108, versus 0.485). Using the average number of stories locally and nationally I calculate the mean total effect of newspaper stories on union demand. Compared to years with no relevant news stories, the mean number of stories in the past year increases the probability of union membership by 0.98 percentage points above the average growth rate.[31]

C. Media Impact by Relevance of Coverage

The model describes a teacher's decision process in choosing to become a union member, highlighting the role of the threat of allegation driven by news stories on the marginal benefit of joining the union. If a teacher shares more characteristics with the teacher in the story one may expect that the story is more relevant in her updating process.

Table 8 presents results according to the school type the teacher works for (primary school or secondary school) in the columns and by the school type reported in the media in the rows. To simplify the presented results, I report the marginal impact of stories at mean, conditioning

[30] Another concern may stem from the subjective nature of the news story classifications. All news stories matched the search terms were categorised, but not all are directly relevant to the hypothesis of the paper. In keeping with this hypothesis of teachers demanding union membership for insurance reasons, I am only counting stories which involve accusations ('Allegations', 'Being Sued', and 'Criminal Activity'). Appendix Table 5 repeats the analysis using all news story types and shows that the effect is muted but remains significant. The table also presents estimates successively removing types of news, and the impact of each type of news story. This shows that the effects are driven by stories about allegations. Stories about teachers being attacked are statistically significant, but their removal from the total story count has limited impact due to their rarity. For the remainder of the analysis, I use the broader definition of stories about accusations.

[31] Appendix Table 6 presents the results sequentially dropping one region at a time from the sample. The estimates move slightly in each case, but they tell a consistent story with an effect size around 0.37 percentage point increase in the likelihood of being a union member per story.

on individual characteristics and year and regional effects (original estimates appear in Online Appendix Table 1). Column 1 uses the subsample of secondary school teachers; Column 2, primary school teachers. Panel A shows that the estimates of all relevant news stories, whether school type was mentioned or not. It shows that secondary school teachers react to media coverage, but there is no significant reaction from primary school teachers. This finding coincides with there being more relevant stories involving secondary school teachers (from Table 3: 285 secondary stories versus 90 primary stories).

Panels B and C instead use only the stories involving secondary and primary school teachers respectively. I find that demand for union membership amongst secondary school teachers significantly reacts to each story involving other secondary school teachers (0.892 percentage points) but not to stories involving primary school teachers (Column 1). For primary school teachers, for whom there are far fewer stories, neither effect is statistically significant; however, the coefficient relating to primary school stories is higher than the one for secondary schools. These results are replicated in Columns 3 and 4, which instead use all relevant news stories, not just those relating to accusations. As before, this produces similar results to the highly relevant stories, in which secondary school teachers react more in general and react more to secondary school stories than primary school stories. With this broader news story definition, I find a marginally significant effect of primary news stories on primary school teachers.

Table 9 has the same structure as Table 8 but focuses on the similarity of the teachers' gender to that of the story. We see that only female teachers react significantly to relevant news stories in general. This could be indicative of female teachers being more risk averse in their type θ, so, for any given increase in perceived threat, the increase in demand for insurance would be larger. Once we examine the impact by story type, male teachers do significantly react to news stories involving other male teachers (0.587) but not to those relating to female teachers (-0.070). Female teachers also react more to stories involving male teachers rather than female teachers (0.886, 0.398).[32] These findings are repeated using all story types (Columns 3 and 4), rather than those just relating to accusations against the teacher and produce similar results.

[32] A possible explanation for these results is that female teachers, despite ostensibly having more in common with other female teachers mentioned in the press, may believe the incidence of false allegations to be higher in cases involving men and therefore react more to these types of stories.

With the exception of female teachers, the heterogeneity by school type and gender shows that individuals who share more characteristics with the story react more strongly. Although these differences are not always statistically significant, they suggest that something specific about the nature of the stories is driving demand and not a spurious correlation. There are two primary channels for this heterogeneity. First, this might be rational as the news story would be indicative of higher future allegation risk for teachers with the specific characteristics. Second, teachers might react more strongly as such news stories are more salient even though the news story might not be indicative of differential increases in allegation risks between teacher characteristics.

To examine the first channel, I test if the *first* occurrence of a particular story and type (region, school type, or gender) is predictive of similar first occurrences of stories in the next year. Any significant positive correlation implies that teachers may be reacting rationally to an increased threat, assuming news stories are a reliable and stable measure of accusations. If journalists are more likely to report on a certain story type because there was a similar story the year before, then any effect could be interpreted as an increase in the threat of an allegation being reported in the news.

Table 10 presents estimates from five OLS regressions between the number of new news stories in a region and the number of new news stories in the same region in the subsequent year. This is estimated at the regional level conditional on year and regional effects. We see that for every new story there are 0.34 new stories in the following year. Panels B and C again split the stories by school level and teacher gender respectively, testing if there is a link between the types of stories reported in subsequent years. Column 1 of Panel B presents how the number of new stories involving primary school teachers significantly increases by 0.12 for each new story involving a primary teacher in the previous year, but insignificantly by 0.04 for new stories involving secondary school teachers. Again, the amount of new news stories involving secondary school teachers significantly relates to the number of news stories about secondary schools, but not primary schools.

For gender, we find that the number of new stories about males in the previous year is significantly positively related to the number of stories relating to male and female teachers. However, the stories involving female teachers in the previous year is not significantly related to the number of news stories regarding males or females in the next year, although both have a positive coefficient. This could rationalise the lack of reactions of female teachers to stories about teachers in the year before.

To recap, the incidence of new story types follows that of the impact of media stories on the likelihood of union membership. The incidence of primary school stories is correlated with the future number of primary school stories and union membership, and similarly for secondary schools. The incidence of new male stories is correlated with the future number of stories of both genders and union membership. In contrast, new stories involving female teachers is related to neither the number of stories in the next year nor the likelihood of union membership of either gender. Regardless of the nature of threat to which they are responding, actual allegations or the reporting of allegations, this result implies that teachers are responding rationally to the occurrences of news stories in their region. This does not exclude the possibility that teachers also react more strongly to stories that they share characteristics with because they are also more salient.

D. Media Impact on Other Occupations

As a robustness check that these reports are reflecting a change to the perceived threat to teachers and not to general union demand, I now estimate the impact of news stories on individuals from other related and unrelated occupations. Table 11 shows the impact of these stories on occupations that are increasingly dissimilar to teachers: educational assistants, higher education professionals, non-teacher public sector graduates, and non-teacher graduates. The coefficients of interest are not significant for any of the other occupational groups. However, there is evidence of an effect on education assistants which has a larger marginal effect at the mean compared to the teachers but is insignificantly determined (0.622 versus 0.377 percentage points). Moreover, the insignificant effects decrease in size as the occupations become less similar to teachers, with the effect of teacher news stories being a tenth of the size on non-teacher graduates in general.

E. Longer Run Media Impact

All the estimates presented so far have been estimating the impact of media coverage that occurred in the twelve months prior to the interview, thereby restricting the impact of news that occurred before this time to have no influence on an individual's decision. Table 12 presents the impact of regional highly relevant media in six-month periods up to 36 months before the survey interview. I find that individuals react in a similar way to stories from the last six to twelve months, and effects continue to exist from stories that happened between a year and eighteen months ago, but stories prior to that have no significant impact. This implies that, for

those marginal members who were otherwise indifferent to joining, being a union member is not an absorbing state. Alternatively, it could be interpreted that if a potential union member hasn't joined within the first eighteen months of a story being published then that story is not going to impact her decision.[33]

In addition to extending the period over which previous news stories can impact current unionisation rates, I use this event study approach to test an important assumption: that media stories are not endogenous. One can imagine if a union has more members in a region at a point in time, that union would be able to generate more news stories or publicity. This would generate a reverse causality (i.e., increased union membership increases the number of news stories). To test for this possibility, I estimate the impact of news stories that have yet to be reported on current membership status. Positive significant estimates of future stories would imply that increased union density generates more stories. This could be generated also through increased likelihood of moral hazard by the teachers. Figure 4 presents an event study showing the impact of news stories occurring up to 36 months the after the interview and 30 months before. We again see past news stories affecting the current likelihood of union membership, but, importantly, stories that have yet to occur have no significant impact.

Having established that there are effects of news stories up to eighteen months beforehand, I now estimate the total impact of media coverage on union membership over time. Allowing for separate effects for the amount of news stories in each six-month period up to 36 months prior to the QLFS interview, both nationally and regionally, I predict the probability of union membership for the years between 1993 and 2010. These estimates are plotted in Figure 5. The predicted probabilities from the model fit closely to the plotted series of actual union density, rarely diverging from the 95% confidence interval band. This model provides a better fit to the data compared to a specification that omits perceived threat parameters. This series is also plotted in Figure 5 and fails to reflect the growth in density from 1998 and the fall that occurred post 2005, the year in which new regulations were introduced that made it harder to report on stories before they arrived to court.

To estimate the aggregate impact that increased perceived threat has had on union membership, I use these estimates to re-predict union membership for each year *fixing the total news coverage to zero*. This provides a counterfactual time series of what would have occurred

[33] Appendix Table 7 shows the impact of extending the period of analysis from six months out to 36 months out in six-month steps.

had there been no increase in the threat of allegations. The figure shows that, without media coverage, union membership would have been relatively stable at around 81 percent from 1996 onwards, instead of steadily rising to 87.5 percent. In the period from 1999 through 2009, union density is significantly greater than estimates from where there was no media coverage. Between 2002 and 2008, this estimated difference in union membership is 5 percentage points.[34]

5. Conclusions

This paper examines the role that the threat of accusations has had in the demand for trade union membership amongst teachers in the UK. I find that teachers from regions where news stories of accusations against other teachers originate are more likely to join a union in the following eighteen months. For every ten stories in a region, a teacher is 4 percent more likely to join. These effects are larger if teachers share characteristics with the teacher mentioned in the story (e.g., secondary school teachers react more to stories involving other secondary school teachers; similarly for male teachers). That the incidence of new news stories making the national news follows these same patterns, coupled with the finding that the average teacher over a career of 35 years has a 24 percent chance to have a non-upheld allegation made against them, is evidence that these actions are rational.

While national newspaper coverage is not a complete measure of media exposure, we should think of it as a proxy for media coverage more generally. It accurately predicts the changes in union membership since 1993. Setting media stories to zero throughout the period, I forecast that union membership would remain steady at approximately 81 percent rather than increasing to 87 percent as seen in the data and, therefore, accounts for 45 percent of the growth in union density between 1992 and 2010.

This paper provides evidence as to why individuals choose to join a trade union even if they have the opportunity to free-ride on the traditional benefits of union membership, such as higher pay and better working conditions. Unions offering a private excludable service can maintain demand for membership, as long as demand for that service remains intact. The policy

[34] The paper uses media coverage as the determinant of the threat of an accusation alternatively. It may be the case that these news stories reflect a growing number of actual allegations. Using the data on actual allegations, over a shorter time period with fewer regions, I find a positive correlation between news stories and allegations. However, in a horserace between these two on a greatly reduced sample (3,399 observations), only news stories are significant (Appendix Table 8).

implication is that the introduction of ‘right to work’ legislation will not necessarily reduce demand for union membership to zero. Additionally, there may be an increasing unmet demand for union membership in previously under-unionised service sectors where the threat of litigation is increasing. Finally, if regulations are introduced that protect individuals from allegations, then the demand for union services, and hence membership, will decline.

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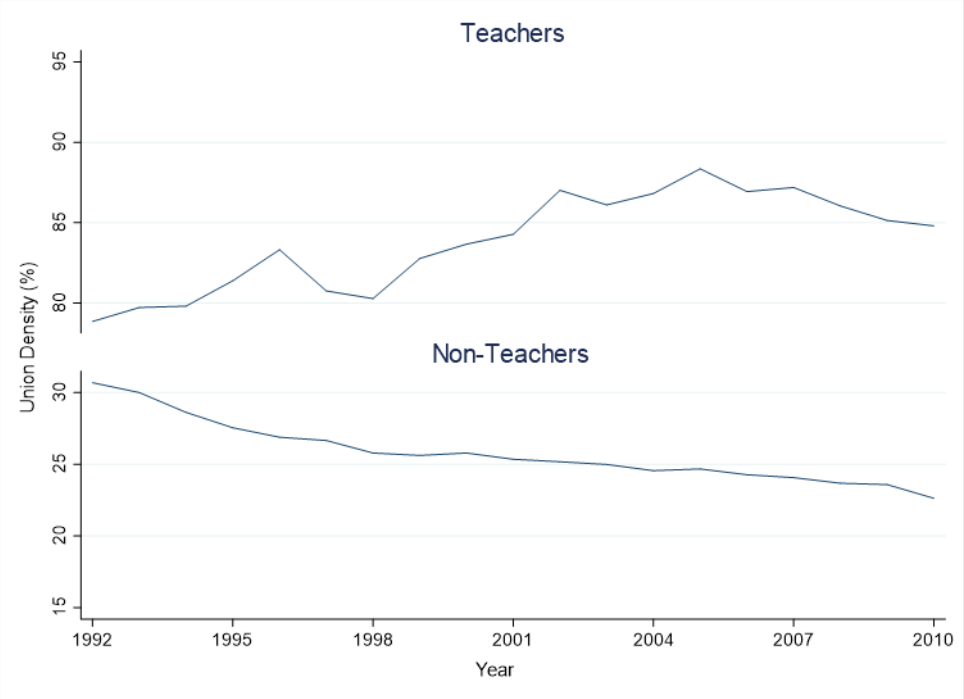
Figures

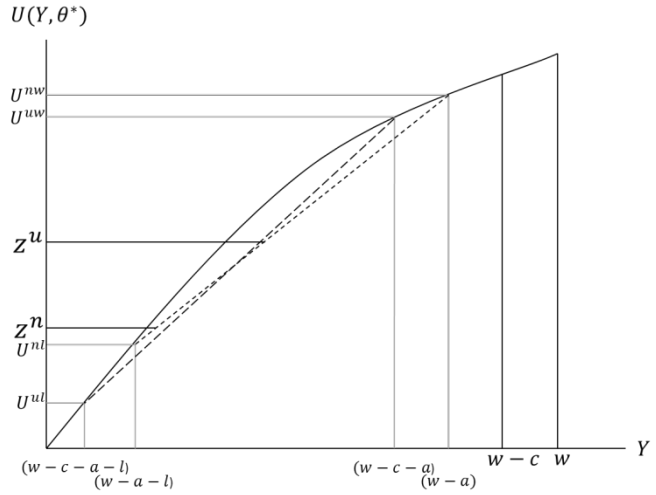
Figure 1: Union Density Time Series by Occupation



Source: QLFS 1992-2010. Proportion of all adults reporting an occupation who are union members. Teachers defined by occupational codes 2314, 2315, 2316

Figure 2: Illustration of Union Membership Decision

Panel A: Utility curve of teacher $U(Y, \theta^*)$ with wages w, union dues c.

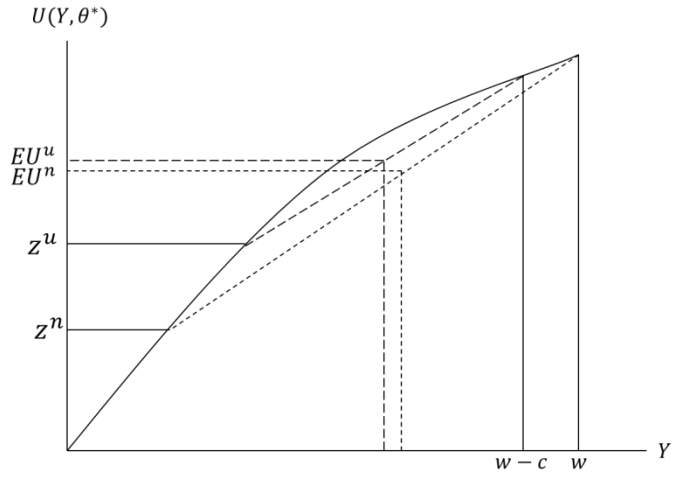


Notes: U^{uw} (U^{ul}) is the utility of a union member who has had an allegation made against them and won (lost) their case. Similarly for non-members U^{nw} (U^{nl}). Z^u (Z^n) represents the expected utility once an allegation has been made for a union (non-union) member. a represents the cost of an allegation and l the additional cost of being found guilty.

– – – – *Union Member*

- - - - - - *Non Union Member*

Panel B: Expected utilities of teacher $U(Y, \theta^*)$ with a high perceived risk $\delta(s)$=0.5



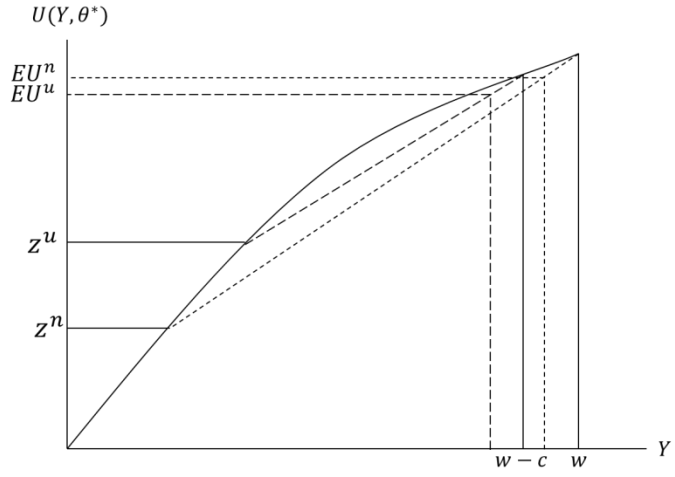
Notes: EU^u (EU^n) represents the expected utility of a union (non-union) member for a given threat level $\sigma(s)$.

When the risk is high δ(s)=0.5, at the midpoint of each cord, then $EU^u > EU^n$.

– – – – *Union Member*

- - - - - - *Non Union Member*

Panel C: Expected utilities of teacher $U(Y, \theta^*)$ with a low perceived risk $\delta(s)$=0.1



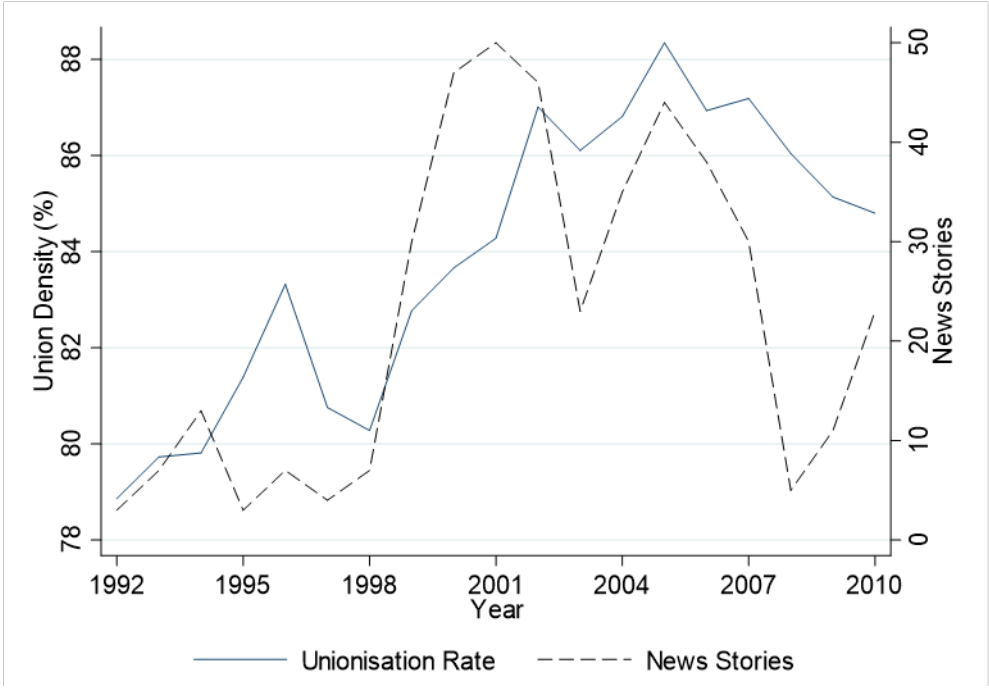
Notes: EU^u (EU^n) represents the expected utility of a union (non-union) member for a given threat level $\sigma(s)$.

When the risk is low δ(s)=0.1, teachers are at a higher point on each cord and then $EU^u > EU^n$.

– – – – *Union Member*

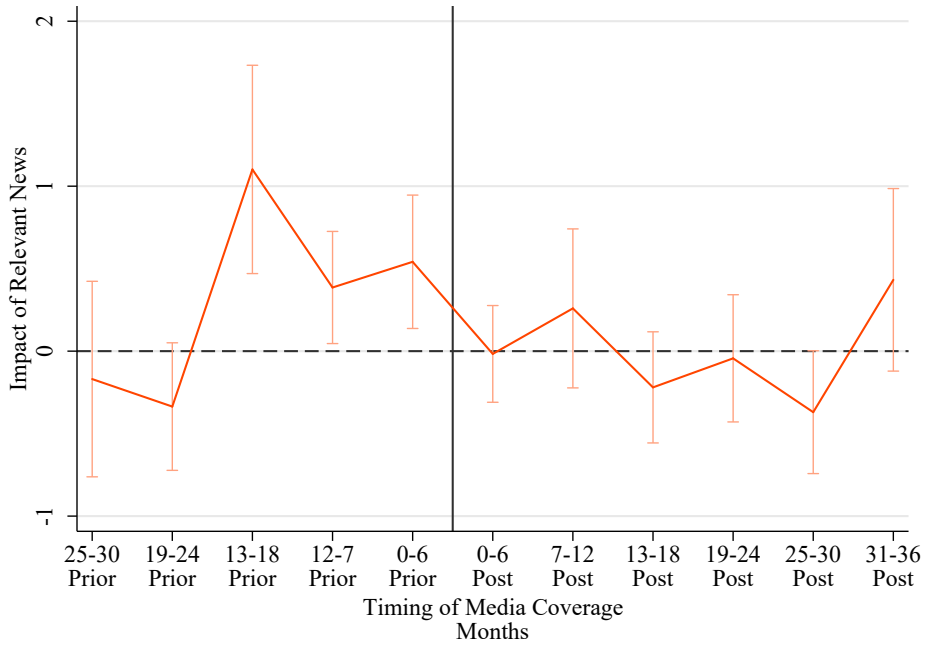
- - - - - - *Non Union Member*

Figure 3 Union Density and Relevant News Stories over time



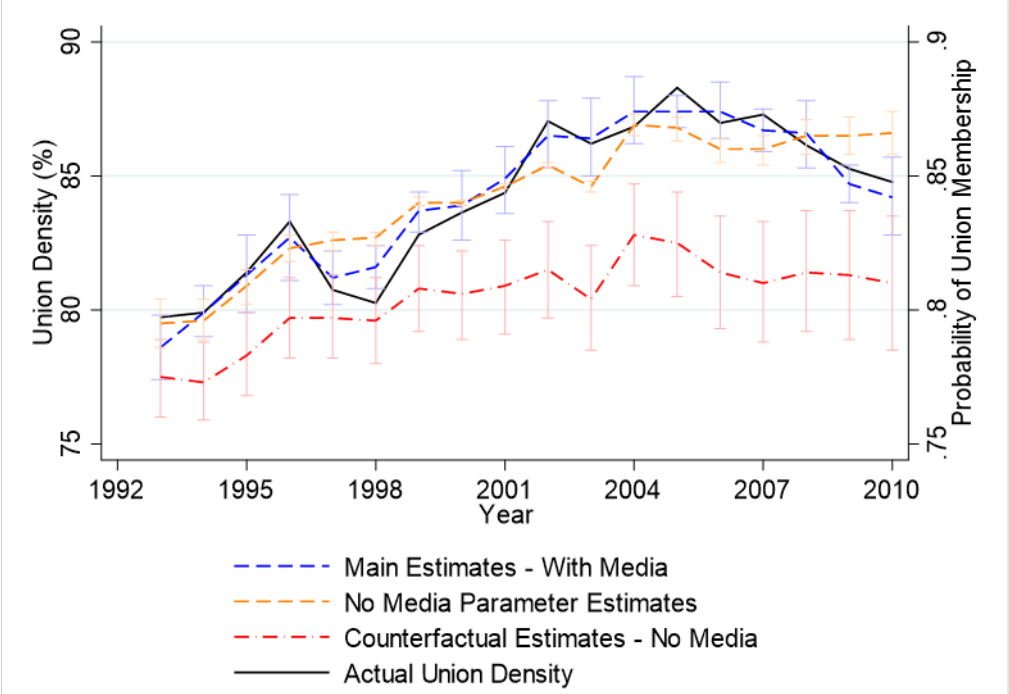
Source: QLFS 1992:2010, Lexis Nexus 1992-2010 *Notes*: Annual union density based on mean union membership of teachers based on QLFS reporting year. News story total based on total relevant news stories about teachers concerning Allegations; Being Sued, and Criminal Activity over a calendar year.

Figure 4 Event Study of Union Membership and Media Coverage



Source: QLFS 1993-2010 *Notes*: Predictions of probability union from a logit regression for each year. Impact in terms of percentage point impacts e.g. 1 is a percentage point increase. Allows separate effect of news stories regionally (and their square), for each six-month period up to 36 months post or prior to the interview.

Figure 5 Predicted Union Density with and without Media Reports



Source: QLFS 1993-2010 *Notes*: Predictions of union status from a logit regression, allowing separate effect of news stories regionally and nationally (and their square), for each six month period up to 36 months prior to the interview. The counterfactual estimates are generated with the same parameters apart from setting the media terms to zero. Accusation stories are stories involving *Allegations, Being Sued* and *Criminal Activity*. Stories Regionally is a count of the number of news stories that originated in the region that the teacher resides in the previous 6 months, 7-12 months, 13-18 months, 19-24 months, 25-30 months, and 31-36months. Similarly, Stories Nationally is a count for the number of all news stories, including stories that could not be allocated to a specific region. Standard errors, in *italics*, are clustered at the regional level.

Tables

Table 1: Allegations by Employer and Type of Allegation

All Reporting Local Authorities 2007-2011	Type of Allegation					
Employer	**Physical**	**Emotional**	**Sexual**	**Neglect**	**Other**	**Total**
Education	6,267	932	2,642	316	862	11,019
Foster Carers	1,512	305	388	255	70	2,530
Social Care	1,085	169	356	176	112	1,898
Secure Estate	384	15	26	0	6	431
Health	257	42	177	66	41	583
Voluntary Youth Organisations	203	34	342	23	48	650
Faith	177	8	96	1	12	294
Police	142	33	72	9	12	268
Immigration	39	2	39	6	0	86
Connexions	14	4	14	3	5	40
Youth Offending Teams	10	8	19	6	9	52
Armed Forces	6	0	25	1	0	32
Probation	5	0	2	1	0	8
NSPCC	4	1	2	0	1	8
CAFCASS	1	2	2	1	1	7
Other	1,380	247	941	233	247	3,048
Total by type	11,486	1,802	5,143	1,097	1,426	20,954

Source: Freedom of Information Requests to English Local Authorities. *Note*: Lists of responding Local Authorities and balanced Panel of Local Authorities is in Appendix 1

Table 2: Total Recorded Outcomes of Allegations

All Reporting Local Authorities 2007-2011	Allegation Outcome				
	Not Upheld	Police Involvement	Disciplinary Procedures	Referral	Total
Total	4,680	1,030	3,058	1,373	10,141
Percent of total	46.1%	10.2%	30.2%	13.5%	

Source: Freedom of Information Act Requests to English Local Authorities. Notes: Not Upheld – No further action after initial consideration, Being unfounded, Being unsubstantiated, Being malicious, Acquittal ; Police Involvement – Criminal investigation, Conviction; Disciplinary Procedures – Disciplinary Action, Suspension, Dismissal, Resignation, Cessation of use, Inclusion on barred/restricted employment list; Referral - Section 47 investigation, Referral to DCSF, Referral to Regulatory Body. Total outcomes do not equal total number of cases as not all cases had an outcome in the last 12 months.

Table 3: Employee Summary Statistics

	Teachers		All Employees	
	Mean	Std. Dev.	Mean	Std. Dev.
	(1)	(2)	(1)	(2)
Union Member	0.840	*0.367*	0.276	*0.447*
Public Sector	0.886	*0.317*	0.246	*0.431*
Male	0.275	*0.447*	0.525	*0.499*
Full Time	0.786	*0.410*	0.738	*0.440*
University Qualification	0.743	*0.437*	0.180	*0.384*
A-Level Qualification	0.761	*0.426*	0.304	*0.460*
Age	42.67	*10.32*	40.29	*12.78*
Tenure				
less than 3 months	0.066	*0.249*	0.058	*0.235*
3 months but less than 6	0.016	*0.125*	0.047	*0.211*
6 months but less than 12	0.026	*0.158*	0.068	*0.252*
1 year but less than 2	0.082	*0.275*	0.107	*0.309*
2 years but less than 5	0.188	*0.390*	0.207	*0.405*
5 years but less than 10	0.205	*0.403*	0.193	*0.395*
10 years but less than 20	0.241	*0.428*	0.196	*0.397*
20 years or more	0.176	*0.381*	0.123	*0.329*
Government Region				
Tyne and Wear	0.015	*0.122*	0.018	*0.132*
Rest of North East	0.025	*0.155*	0.024	*0.154*
Greater Manchester	0.037	*0.190*	0.039	*0.194*
Merseyside	0.022	*0.145*	0.019	*0.138*
Rest of North West	0.049	*0.217*	0.050	*0.218*
South Yorkshire	0.021	*0.142*	0.021	*0.144*
West Yorkshire	0.038	*0.191*	0.037	*0.190*
Rest of Yorkshire & Humberside	0.028	*0.165*	0.029	*0.167*
East Midlands	0.073	*0.260*	0.074	*0.262*
West Midlands Metropolitan County	0.041	*0.198*	0.039	*0.193*
Rest of West Midlands	0.048	*0.213*	0.050	*0.218*
East of England	0.097	*0.296*	0.099	*0.299*
Inner London	0.030	*0.170*	0.034	*0.180*
Outer London	0.068	*0.252*	0.066	*0.248*
South East	0.145	*0.352*	0.147	*0.354*
South West	0.079	*0.269*	0.088	*0.283*
Wales	0.050	*0.217*	0.046	*0.208*
Strathclyde	0.039	*0.193*	0.035	*0.185*
Rest of Scotland	0.057	*0.232*	0.055	*0.228*
Northern Ireland	0.040	*0.195*	0.030	*0.170*
Observations	30,392		988,256	

Source: QLFS 1993-2010 Autumn Survey, sample of all employees 18-64 *Notes*: Teachers defined as Standard Occupational Classification codes (1993-2000):233, 234, 235 and Standard Occupational Classification Codes (2001-2010): 2314, 2315, 2316

Table 4: Summary Statistics –News Coverage 1991-2010

		Story Type							
Panel A: All Newspaper Stories									
Relevance of Story	Allegations	*Being Sued*	*Suing*	*Being Attacked*	*Criminal Activity*	Sacked	*Employment Tribunal*	*Union Activity*	Total
Extremely Relevant	322	45	100	4	12	15	61	64	623
Highly Relevant	179	28	52	45	53	36	43	112	548
Little Relevance	155	12	3	19	123	14	12	56	394
Not Relevant	55	1	2	10	68	4	0	4	144
Total	711	86	157	78	256	69	116	236	1709
Panel B: Balanced Newspaper Panel Stories									
Relevance of Story	Allegations	*Being Sued*	*Suing*	*Being Attacked*	*Criminal Activity*	Sacked	*Employment Tribunal*	*Union Activity*	Total
Extremely Relevant	222	27	78	3	6	9	48	48	441
Highly Relevant	115	22	36	29	37	16	35	78	368
Little Relevance	95	5	1	10	77	8	9	46	251
Not Relevant	38	1	2	1	32	0	0	2	76
Total	470	55	117	43	152	33	92	172	1136

Source: LexisNexis 1991-2010. News search of national newspapers with the following term: *headline(teacher) and court or damages or sued or jail or litigation or dismissed or fired or allegations and #GC329# (The code for a story originating in the UK). The stories were categorised using the rubric shown in Appendix Table 2. Panel A shows the total number of news stories in national newspapers in the LexisNexis database. Panel B shows the number of news stories from National Newspapers who were in the database throughout the entire period.* National Newspapers: Daily Mail, Daily Star, Mail on Sunday, Morning Star, The Express, Sunday Express, The Daily Telegraph, Sunday Telegraph, The Sun, The News of the World, The Guardian, The Independent, The Observer, The People, The Times, The Sunday Times. The Balanced Panel of Newspaper Stories: Daily Mail, Mail on Sunday, The Guardian, The Independent, The Mirror, Daily Star, Observer, The Times, The Sunday Times.

Table 5: Total News Coverage by Story Subject

Panel A: All Newspaper Stories 1992-2010				
	Relevant Stories		Any Relevance Stories	
News Story Subject	Story Type Accusation	All Types	Story Type Accusation	All Types
By School Type				
Secondary School	435	661	706	975
	(68.1%)	(66.2%)	(67.0%)	(66.1%)
Primary School	126	186	184	249
	(19.7%)	(18.6%)	(17.5%)	(16.9%)
By Teacher Gender				
Male Teacher	327	469	591	762
	(51.1%)	(46.9%)	(56.1%)	(51.6%)
Female Teacher	303	521	455	705
	(47.4%)	(52.2%)	(43.2%)	(47.8%)
All Stories	639	999	1053	1476

Panel B: Balanced Newspaper Panel Stories 1992-2010				
	Relevant Stories		Any Relevance Stories	
News Story Subject	Story Type Accusation	All Types	Story Type Accusation	All Types
By School Type				
Secondary School	285	439	443	620
	(66.3%)	(63.9%)	(65.0%)	(63.7%)
Primary School	90	142	128	182
	(20.9%)	(20.7%)	(18.8%)	(18.7%)
By Teacher Gender				
Male Teacher	218	315	381	490
	(50.7%)	(45.9%)	(55.9%)	(50.4%)
Female Teacher	200	362	289	471
	(46.5%)	(52.7%)	(42.4%)	(48.4%)
All Stories	430	687	677	973

Source: LexisNexis 1991-2010 of National Newspapers, Balanced Panel. *Note*: Percentages in parentheses represent proportion of all stories of that type on that subject. Story Type: Accusation includes- Allegations, Being Sued and Criminal Activity. Union Activity not included under All Types as is only counted in national totals as not based in one region or reflect a specific teacher type. Total stories do not equal those from Table 3 as some stories are double counted when both male and female teachers are mentioned, or both primary and secondary schools are mentioned.

Table 6: Union Membership on News Coverage

Panel A: Extremely Relevant News Stories of Accusations				
P(Union Membership)	(1)	(2)	(3)	(4)
Stories Regionally	0.548**	0.588***	0.674**	0.502**
	0.235	*0.206*	*0.325*	*0.251*
Stories Regionally	-0.024	-0.034**	-0.047**	-0.046***
Squared	*0.018*	*0.015*	*0.019*	*0.014*
Marginal Effect at	0.509**	0.529***	0.594***	0.425**
Mean	*0.208*	*0.181*	*0.187*	*0.193*
Panel B: All Relevant News Stories of Accusations				
P(Union Membership)	(1)	(2)	(3)	(4)
Stories Regionally	0.841***	0.783***	0.758***	0.455***
	0.158	*0.139*	*0.200*	*0.148*
Stories Regionally	-0.041***	-0.039***	-0.034***	-0.026***
Squared	*0.008*	*0.007*	*0.008*	*0.007*
Marginal Effect at	0.715***	0.659***	0.650***	0.377***
Mean	*0.133*	*0.115*	*0.121*	*0.133*
Panel C: Little/No Relevance News Stories of Accusations				
P(Union Membership)	(1)	(2)	(3)	(4)
Stories Regionally	0.098	0.169	0.222	-0.151
	0.202	*0.177*	*0.153*	*0.147*
Stories Regionally	0.015	0.003	-0.004	0.005
Squared	*0.012*	*0.01*	*0.005*	*0.005*
Marginal Effect at	0.120	0.174	0.216	-0.145
Mean	*0.189*	*0.166*	*0.189*	*0.202*
Teacher Characteristics		✓	✓	✓
Regional Effects			✓	✓
Year Effects				✓
Observations	30,392	30,392	30,392	30,392

Source: QLFS 1993-2010. Notes: Estimates from a logit regression of individual decision to join a union. Reporting the marginal effects at mean. All coefficients and standard errors are multiplied by 100 for ease of interpretation, so can be read a percentage change in probability. Accusation stories are stories involving *Allegations, Being Sued and Criminal Activity*. Stories Regionally is a count for the number of news stories that originated in the region that the teacher resides. Standard errors, in *italics*, are clustered at the regional level.

Table 7: Union Membership on Regional and National News Coverage of Accusations

	Story Relevance		
	Extremely Relevant Stories	*Relevant Stories*	Little/No Relevance
P(Union Membership)	(1)	(2)	(3)
Stories Regionally	0.485*	0.442***	-0.159
	0.265	*0.147*	*0.137*
Stories Regionally Squared	-0.042***	-0.022***	0.005
	0.015	*0.007*	*0.004*
Stories Nationally	0.108**	0.030	-0.261
	0.051	*0.044*	*0.236*
Stories Nationally Squared	-0.002*	0.000	0.005***
	0.001	*0.001*	*0.001*
Marginal Effect at Mean	0.472*	0.408**	-0.285**
	0.244	*0.133*	*0.143*
Total Effect at Mean	0.980**	0.941**	-2.022
Teacher Characteristics	✓	✓	✓
Regional Effects	✓	✓	✓
Time Trend	✓	✓	✓
Observations	30,392	30,392	30,392

Source: QLFS 1993-2010 Notes: Estimates from a logit regression of individual decision to join a union. Reporting the marginal effects at mean. All coefficients and standard errors are multiplied by 100 for ease of interpretation, so estimates can be read a percentage change in probability. Accusation stories are stories involving *Allegations, Being Sued and Criminal Activity*. Stories Regionally is a count for the number of news stories that originated in the region that the teacher resides in the previous 12 months. Stories Nationally is a count for the number of all news stories in the previous 12 months, including stories that could not be allocated to a specific region. Standard errors in *italics*, clustered at the regional level.

Table 8: Union Membership on Union Membership by Teacher and Story School Type

	Stories of Accusations		All Story Types	
	Secondary School Teachers	Primary School Teachers	Secondary School Teachers	Primary School Teachers
P(Union Membership)	(1)	(2)	(3)	(4)
Panel A: Relevant Stories				
Total Marginal Effect	0.683***	0.045	0.431**	0.090
	0.198	*0.130*	*0.156*	*0.111*
Panel B: Relevant Secondary School Stories				
Total Marginal Effect	0.892***	0.051	0.388*	0.129
	0.196	*0.274*	*0.208*	*0.191*
Panel C: Relevant Primary School Stories				
Total Marginal Effect	0.114	0.633	0.047	0.633*
	0.634	*0.662*	*0.312*	*0.314*
Teacher Characteristics	✓	✓	✓	✓
Regional Effects	✓	✓	✓	✓
Year Effects	✓	✓	✓	✓
Observations	13,949	14,076	13,949	14,076

Source: QLFS 1993-2010 Notes: Estimates from a logit regression of individual decision to join a union on news stories. Reporting the marginal effects at mean after accounting for quadratic terms. All coefficients and standard errors are multiplied by 100 for ease of interpretation, so estimates can be read a percentage change in probability. Accusation stories are stories involving *Allegations, Being Sued and Criminal Activity*. Relevant Stories include both Extremely and Highly relevant news stories. Stories Regionally is a count for the number of news stories that originated in the region that the teacher resides in the previous 12 months. Standard errors, in *italics*, are clustered at the regional level.

Table 9: Union Membership on Union Membership by Teacher and Story Gender

	Stories of Accusations		All Story Types	
	Male Teachers	Female Teachers	Male Teachers	Female Teachers
P(Union Membership)	(1)	(2)	(3)	(4)
Panel A: Relevant Stories				
Total Marginal Effect	0.031	0.508***	0.134	0.296***
	0.135	*0.170*	*0.149*	*0.114*
Panel B: Relevant Male Teacher Stories				
Total Marginal Effect	0.587*	0.886***	0.539*	0.471*
	0.339	*0.293*	*0.330*	*0.241*
Panel C: Relevant Female Teacher Stories				
Total Marginal Effect	-0.070	0.398	0.073	0.134
	0.288	*0.372*	*0.192*	*0.195*
Teacher Characteristics	✓	✓	✓	✓
Regional Effects	✓	✓	✓	✓
Year Effects	✓	✓	✓	✓
Observations	8,361	22,031	8,361	22,031

Source: QLFS 1993-2010 Notes: Estimates from a logit regression of individual decision to join a union on news stories. Reporting the marginal effects at mean after accounting for quadratic terms. All coefficients and standard errors are multiplied by 100 for ease of interpretation so estimates can be read a percentage change in probability. Accusation stories are stories involving *Allegations, Being Sued and Criminal Activity*. Relevant Stories include both Extremely and Highly relevant news stories. Stories Regionally is a count for the number of news stories that originated in the region that the teacher resides in the previous 12 months. Standard errors, in *italics*, are clustered at the regional level.

Table 10: Persistence of Story Types

Number of Stories (t)	(1)	(2)
Panel A: Prior Stories		
All Stories (t-1)	0.342***	
	0.055	
	Primary Teacher	Secondary
Panel B: Prior Stories by School Type	Stories	Teacher Stories
Primary Teacher Stories (t-1)	0.122***	0.157
	0.059	*0.111*
Secondary Teacher Stories (t-1)	0.044	0.263***
	0.030	*0.056*
	Male Teacher	Female Teachers
Panel C: Prior Stories by Gender	Stories	Stories
Male Teacher Stories (t-1)	0.284***	0.101***
	0.058	0.039
Female Teacher Stories (t-1)	0.056	0.080
	0.097	*0.064*
Teacher Characteristics	✓	✓
Regional Effects	✓	✓
Year Effects	✓	✓
Observations	360	360

Source: Lexus-Nexis 1992-2010 Notes: Estimates from five OLS regressions of number of new news stories last year on number of new news stories this year, conditional on year and regional fixed effects. Accusation stories are stories involving *Allegations, Being Sued and Criminal Activity*. Relevant Stories include both Extremely and Highly relevant news stories. This only uses the first incidence of a story.

Table 11: Union Membership on Union Membership by Occupation

Occupation Group	Teachers	Education Assistants	Higher Education	Non Teacher Public Sector Graduates	Non Teacher Graduates
P(Union Membership)	(1)	(2)	(3)	(4)	(5)
Relevant Stories	0.455***	0.688	0.235	0.196	0.064
Regionally	0.148	*0.577*	*0.422*	*0.261*	*0.147*
Relevant Stories	-0.026***	-0.021	-0.018	-0.001	-0.001
Regionally Squared	0.007	*0.023*	*0.018*	*0.010*	*0.007*
Marginal Effect at	0.377***	0.622	0.185	0.133	0.051
Mean	0.133	*0.582*	*0.425*	*0.204*	*0.091*
Teacher Characteristics	✓	✓	✓	✓	✓
Regional Effects	✓	✓	✓	✓	✓
Year Effects	✓	✓	✓	✓	✓
Observations	30,392	10,022	9,007	49,671	154,932

Source: QLFS 1993-2010 Notes: Reporting the marginal effects at mean from a logit estimate. All coefficients and standard errors are multiplied by 100 for ease of interpretation, so estimates can be read a percentage change in probability. Accusation stories are stories involving *Allegations, Being Sued and Criminal Activity*. Relevant Stories include both Extremely and Highly relevant news stories. Stories Regionally is a count for the number of news stories that originated in the region that the teacher resides in the previous 12 months. SOC codes: Educational Assistants 652, 6124; Higher Education 230, 231, 2311, 2312. Standard errors in *italics*, clustered at the regional level.

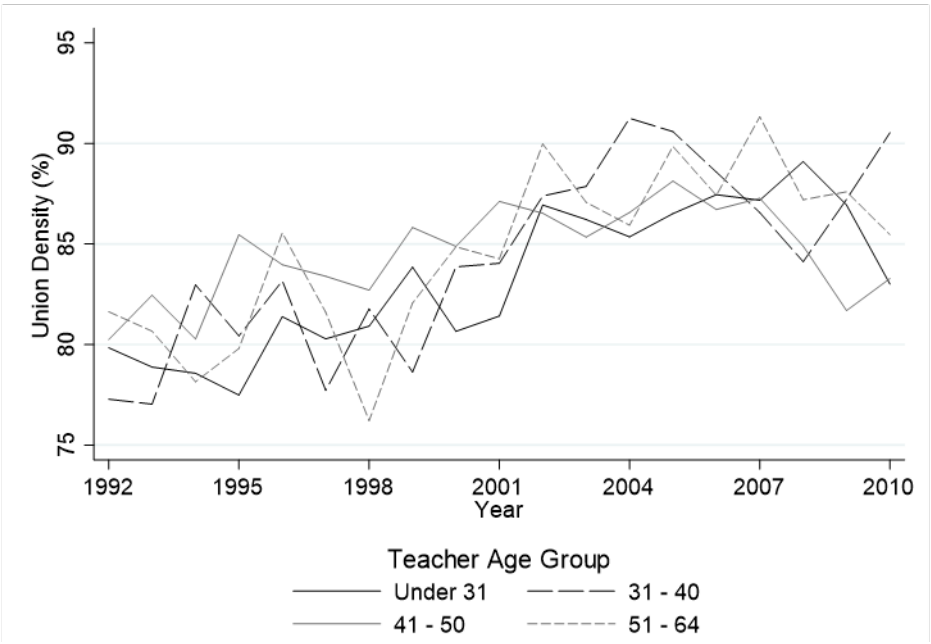
Table 12: Union Membership on Union Membership by News Lag Period

News Lag period	Marginal Effects	Total Marginal Effect
P(Union Membership)	(1)	(2)
Stories Last 6 Months	0.487**	0.416**
	0.214	*0.189*
Stories Last 6 Months Squared	-0.053***	
	0.019	
Stories 7-12 Months Previous	0.508***	0.444***
	0.148	*0.133*
Stories 7-12 Months Previous Squared	-0.037***	
	0.008	
Stories 13-18 Months Previous	0.948***	0.845***
	0.348	*0.313*
Stories 13-18 Months Previous Squared	-0.078***	
	0.030	
Stories 19-24 Months Previous	-0.182	-0.162
	0.217	*0.195*
Stories 19-24 Months Previous Squared	0.010	
	0.013	
Stories 25-30 Months Previous	-0.319	-0.275
	0.326	*0.292*
Stories 25-30 Months Previous Squared	0.035	
	0.032	
Stories 31-36 Months Previous	-0.385	-0.341
	0.296	*0.282*
Stories 25-30 Months Previous Squared	0.025	
	0.010	
Teacher Characteristics	✓	✓
Regional Effects	✓	✓
Year Effects	✓	✓
Obs	30,392	30,392

Source: QLFS 1993-2010 Notes: Estimates from a logit regression. Reporting the marginal effects All coefficients and standard errors are multiplied by 100 for ease of interpretation. Accusation stories are stories involving *Allegations, Being Sued and Criminal Activity*. Relevant Stories include both Extremely and Highly relevant news stories. Standard errors, in *italics*, are clustered at the regional level.

Appendix Figures & Tables

Appendix Figure 1: Union Density by Age Group over time



Source: QLFS 1992:2010 *Notes*: Annual union density based on mean union membership of teachers based on QLFS reporting year.

Appendix Table 1: Reasons for Union Membership

"What were the MAIN reasons why you initially joined a teacher union?"	
Belief in the union movement	40%
To improve job security	44%
To improve terms and conditions	56%
For solidarity with other workers	24%
Advice/opinion on educational policy	62%
Support in the event of allegations from pupils	85%
No particular reason	3%
Observations	*176*

Source: Online Survey of Hertfordshire Teachers 2010/11 for unrelated evaluation of UK Resilience Programme on teaching staff (Murphy 2011)

Appendix Table 2: Media Rubric

	Allegations	***Being Sued***	***Suing***	***Being Attacked***	***Criminal Activity***	**Sacked**	***Employment Tribunal***	***Union Activity***	**Total**
Extremely Relevant	Found innocent, case thrown out	Teacher sued for school activity	Sues for damages/ libel	Pupil attacks teacher in classroom	Manslaughter of pupil charges	For health and safety or allegations	Legitimate Unfair dismissal	Discuss threat of allegations/ being sued	
Stories	*322*	*45*	*100*	*4*	*12*	*15*	*61*	*64*	*623*
Highly Relevant	Currently on trial, no verdict	May be sued, could be sued	Lose case, indirectly related to school	Parent-Pupil attacks teacher outside of school	Criminal accusations from pupil	Inappropriate behaviour, not up to standards	Other Unfair dismissal, inappropriate behaviour	As above but brief mention or union demands	
Stories	*179*	*28*	*52*	*45*	*53*	*36*	*43*	*112*	*548*
Little Relevance	Guilty of lesser offence, on trial of hard offence	School/ Council sued	Threats to sue for indirect teaching	Attacked by ex pupil	School related crime	Miscellaneous school related activity	Union back the dismal	Comment on education policy	
Stories	*155*	*12*	*3*	*19*	*123*	*14*	*12*	*56*	*394*
No Relevance	Admits guilt of extreme sexual abuse	Non school related activity	Non school related activity	Non school related activity	Child pornography /murder	Non-school related activity	Non-school related activity	Anti-union members	
Stories	*55*	*1*	*2*	*10*	*68*	*4*	*0*	*4*	*144*
Total	*711*	*86*	*157*	*78*	*256*	*69*	*116*	*236*	*1709*

Source: LexisNeuxs (UK) Results of all stories from national newspapers with the word 'teacher' in the headline and included any of the following terms (or derivatives) in the headline or preliminary paragraphs of the main text (as defined by LexisNexis); teacher, damages, sued, litigation, allegation, jail, court, dismissed or fired, over the period September 1991 to August 2010.

Appendix Table 3: Table 6 with Score-Bootstrap P-values in parentheses and robust clustered standard error in italics

Panel A: Extremely Relevant News Stories of Accusations				
P(Union Membership)	(1)	(2)	(3)	(4)
Stories Regionally	0.548**	0.588***	0.674**	0.502**
	0.235	*0.206*	*0.325*	*0.251*
	[0.019]	[0.004]	[0.002]	[0.023]
Stories Regionally Squared	-0.024	-0.034**	-0.047**	-0.046***
	0.018	*0.015*	*0.019*	*0.014*
	[0.213]	[0.026]	[0.007]	[0.009]
Marginal Effect at Mean	0.509**	0.529***	0.594***	0.425**
	0.208	*0.181*	*0.187*	*0.193*
	[0.011]	[0.005]	[0.001]	[0.027]
Panel B: All Relevant News Stories of Accusations				
P(Union Membership)	(1)	(2)	(3)	(4)
Stories Regionally	0.841***	0.783***	0.758***	0.455***
	0.158	*0.139*	*0.200*	*0.148*
	[0.000]	[0.000]	[0.000]	[0.002]
Stories Regionally Squared	-0.041***	-0.039***	-0.034***	-0.026***
	0.008	*0.007*	*0.008*	*0.007*
	[0.000]	[0.000]	[0.000]	[0.002]
Marginal Effect at Mean	0.715***	0.659***	0.650***	0.377***
	0.133	*0.115*	*0.121*	*0.133*
	[0.000]	[0.000]	[0.000]	[0.002]
Panel C: Little/No Relevance News Stories of Accusations				
P(Union Membership)	(1)	(2)	(3)	(4)
Stories Regionally	0.098	0.169	0.222	-0.151
	0.202	*0.177*	*0.153*	*0.147*
	[0.640]	[0.329]	[0.249]	[0.477]
Stories Regionally Squared	0.015	0.003	-0.004	0.005
	0.012	*0.01*	*0.005*	*0.005*
	[0.204]	[0.764]	[0.666]	[0.667]
Marginal Effect at Mean	0.120	0.174	0.216	-0.145
	0.189	*0.166*	*0.189*	*0.202*
	[0.483]	[0.271]	[0.273]	[0.489]
Teacher Characteristics		✓	✓	✓
Regional Effects			✓	✓
Year Effects				✓
Observations	30,392	30,392	30,392	30,392

Source: QLFS 1993-2010. Notes: Estimates from a logit regression of individual decision to join a union. Reporting the marginal effects at mean. All coefficients and standard errors are multiplied by 100 for ease of interpretation, so can be read a percentage change in probability. Accusation stories are stories involving *Allegations, Being Sued and Criminal Activity*. Stories Regionally is a count for the number of news stories that originated in the region that the teacher resides. Standard errors, in *italics*, are clustered at the regional level. Score-bootstrap p-values in brackets.

Appendix Table 4: Union Membership Alternate Functional Forms for Media Coverage

Panel A: Linear				
P(Union Membership)	(1)	(2)	(3)	(4)
Stories Regionally	0.148	0.121	0.156*	-0.016
	0.113	*0.096*	*0.070*	*0.059*
Panel B: Linear Capped at 95th Percentile				
P(Union Membership)	(1)	(2)	(3)	(4)
Stories Regionally	0.545**	0.518***	0.591***	0262***
	0.240	*0.178*	*0147*	*0.113*
Panel C: Inverse Hyperbolic Sine				
P(Union Membership)	(1)	(2)	(3)	(4)
Stories Regionally	0.508*	0533***	0694***	0.271*
	0.262	*0.202*	*0.160*	*0.142*
Panel D: Inverse Hyperbolic Sine Capped at 95th Percentile				
P(Union Membership)	(1)	(2)	(3)	(4)
Stories Regionally	0632**	0.690***	0.895***	0.439***
	0.316	*0.235*	*0.207*	*0.152*
Panel E: Little/No Relevance News Stories of Accusations				
P(Union Membership)	(1)	(2)	(3)	(4)
Stories Regionally	0.841***	0.783***	0.758***	0.455***
	0.158	*0.139*	*0.200*	*0.148*
Stories Regionally Squared	-0.041***	-0.039***	-0.034***	-0.026***
	0.008	*0.007*	*0.008*	*0.007*
Marginal Effect at Mean	0.715***	0.659***	0.650***	0.377***
	0.133	*0.115*	*0.121*	*0.133*
Teacher Characteristics		✓	✓	✓
Regional Effects			✓	✓
Year Effects				✓
Observations	30,392	30,392	30,392	30,392

Source: QLFS 1993-2010 Notes: Reporting the marginal effects at mean, all coefficients and standard errors are multiplied by 100 for ease of interpretation. Estimates can be read a percentage change in probability. Accusation stories are stories involving *Allegations, Being Sued and Criminal Activity*. Relevant Stories include both Extremely and Highly relevant news stories. Standard errors, in *italics*, are clustered at the regional level. This table presents five different functional forms for media coverage; linear, linear capped at 95% percentile; inverse hyperbolic sign (which approximates to logarithmic which can include zero), capped inverse hyperbolic sign, and quadratic.

Appendix Table 5: Union Membership by News Coverage Type

News Type Removed	None	- Union Activity	-Attacked	-Sacked	-Tribunal	-Suing	- Criminal	-Sued
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Marginal	0.255***	0.259***	0.249**	0.240**	0.260***	0.377***	0.394***	0.511***
Effect at Mean	*0.099*	*0.100*	*0.102*	*0.103*	*0.100*	*0.133*	*0.141*	*0.157*
News Types Separately	Allegations	Union Activity	Attacked	Sacked	Tribunal	Suing	Criminal	Sued
	(9)	(10)	(11)	(12)	(13)	(14	(15)	(16)
Marginal	0.511***	0.703	1.261**	0.719	0.238	0.194	0.617	0.288
Effect at Mean	*0.157*	*1.102*	*0.502*	*0.711*	*0.546*	*0.364*	*0.765*	*0.542*

Source: QLFS 1993-2010 Notes: Reporting the marginal effects at mean calculated. Estimates 1-8 sequentially remove a story types, starting with all types (1) and ending with only allegations. Estimates 9-16 estimate the impact for each type of news story separately. Relevant Stories include both Extremely and Highly relevant news stories. Stories Regionally is a count for the number of news stories that originated in the region that the teacher resides in the previous year. Standard errors, in *italics*, are clustered at the regional level.

Appendix Table 6: Union Membership Excluding Regions Sequentially

Excluded Region	None	All London	Inner London	Outer London	South East	South West	Tyne & Wear	Rest of N.East
	(1)	(2)	(3)	(4)	(5)	(6)	*(7)*	*(8)*
Marginal Effect	0.377***	0.357**	0.351***	0.394***	0.499***	0.357***	0.372***	0.380***
	0.133	*0.147*	*0.134*	*0.145*	*0.148*	*0.132*	*0.133*	*0.133*
Observations	30,392	27,409	29,487	28,314	25,998	27,996	29,932	29,644
Excluded Region	G.Manch-ester	Mersy-side	Rest of N.West	S.Yorks-hire	West Yorkshire	Rest of Yorkshire	East Midlands	Met-W. Midlands
	(9)	*(10)*	*(11)*	*(12)*	(13)	(14)	(15)	(16)
Marginal Effect	0.411***	0.390***	0.446***	0.381***	0.443***	0.375***	0.383***	0.356***
	0.139	*0.135*	*0.137*	*0.134*	*0.137*	*0.133*	*0.133*	*0.135*
Observations	29,258	29,737	28,891	29,767	29,237	29,539	28,173	29,147
Excluded Region	West Midlands	East England	Wales	Strath-clyde	Rest of Scotland	Northern Ireland		
	(17)	(18)	(19)	(20)	(21)	(22)		
Marginal Effect	0.380***	0.370***	0.295**	0.365***	0.393***	0.369***		
	0.136	*0.137*	*0.145*	*0.138*	*0.142*	*0.136*		
Observations	28,948	27,440	28,880	29,211	28,658	29,191		

Source: QLFS 1993-2010 Notes: Reporting the marginal effects at mean. All coefficients and standard errors are multiplied by 100 for ease of interpretation. Estimates can be read a percentage change in probability. Accusation stories are stories involving *Allegations, Being Sued and Criminal Activity*. Relevant Stories include both Extremely and Highly relevant news stories. Standard errors, in *italics*, are clustered at the regional level.

Appendix Table 7: Union Membership by News Coverage Period

News Coverage period	In last 6 months	In last 12 months	In last 18 Months	In last 24 Months	In last 30 Months	In last 36 Months
P(Union Membership)	(1)	(2)	(3)	(4)	(5)	(6)
Relevant Stories	0.540**	0.449***	0.521***	0.331***	0.141	0.065
Regionally	*0.260*	*0.149*	*0.107*	*0.119*	*0.103*	*0.104*
Relevant Stories	-0.058***	-0.026***	-0.024***	-0.014**	-0.005	-0.001
Regionally Squared	*0.019*	*0.007*	*0.004*	*0.005*	*0.004*	*0.004*
Marginal Effect at	0.472*	0.380**	0.429***	0.258**	0.112	0.055
Mean	*0.261*	*0.150*	*0.425*	*0.204*	*0.106*	*0.109*
Teacher Characteristics	✓	✓	✓	✓	✓	✓
Regional Effects	✓	✓	✓	✓	✓	✓
Year Effects	✓	✓	✓	✓	✓	✓
Observations	30,392	30,392	30,392	30,392	30,392	30,392

Source: QLFS 1993-2010 Notes: Reporting the marginal effects at mean. All coefficients and standard errors are multiplied by 100 for ease of interpretation so estimates can be read a percentage change in probability. Accusation stories are stories involving *Allegations, Being Sued and Criminal Activity*. Relevant Stories include both Extremely and Highly relevant news stories. Stories Regionally is a count for the number of news stories that originated in the region that the teacher resides in the previous X months. Standard errors, in *italics*, are clustered at the regional level.

Appendix Table 8: Union Membership on News Coverage of Accusations and Actual Allegations

News Relevance	Extremely Relevant Stories			Relevant Stories		
P(Union Membership)	(1)	(2)	(3)	(4)	(5)	(6)
Stories Regionally		0.348**	0.335***		0.220	0.197
		0.140	*0.109*		*0.173*	*0.168*
Stories Regionally Squared		-0.055**	-0.040**		-0.050	-0.046
		0.021	*0.019*		*0.093*	*0.065*
Allegations Per 100 Teachers	-0.310*		-0.355	-0.310*		-0.388
	0.227		*0.215*	*0.227*		*0.253*
Teacher Characteristics	✓	✓	✓	✓	✓	✓
Regional Effects	✓	✓	✓	✓	✓	✓
Year Effects	✓	✓	✓	✓	✓	✓
Observations	3,399	3,399	3,399	3,399	3,399	3,399

Source: QLFS 2008-2010 Notes: Estimates from a logit regression. Reporting the marginal effects All coefficients and standard errors are multiplied by 100 for ease of interpretation. Accusation stories are stories involving *Allegations, Being Sued and Criminal Activity*. Relevant Stories include both Extremely and Highly relevant news stories. Standard errors, in *italics*, are clustered at the regional level.

Appendix for Online Publication

Online Appendix 1: Local Authorities who responded to the Freedom of information request regarding allegations

All Local Authorities who responded (Years of data):

Local Authority (Years), Barnet (2) Barnsley (3), Bath and North East Somerset (3), Bedford (1), Bexley (2), Blackburn with Darwen (3), Bolton (3), Bracknell Forest (2), Bradford (3), Brent (4), Bristol City (3), Bromley (3), Buckinghamshire (4), Calderdale (3), Cambridge (2), Camden (3), Central Bedfordshire (1), Cheshire East Council (1), Cheshire West and Chester (2), Cornwall (1), Croyden (3), Cumbria (3), Derby (1), Derbyshire (3), Devon (1), Doncaster (3), Dorset (3), Dudley (3), Durham (3), East Riding of Yorkshire (4), East Sussex (2), Essex (4), Gateshead (3), Gloustershire (2), Greenwich (4), Hackney (1), Hammersmith and Fulham (2), Hampshire (3), Haringey (2), Havering (4), Hertfordshire (2), Hillingdon (3), Hounslow (2), Isle of Scilly (4), Isle of Wight (3), Islington (4), Kensington and Chelsea (2), Kent (4), Kingston Upon Hull (3), Kingston Upon Thames (4), Kirklees (3), Knowsley (3), Lancashire (4), Leeds (4), Leicester (3), Lewisham (4), Lincolnshire (1), Liverpool (1), Luton (2), Manchester (2), Medway (3), Milton Keyenes (1), Newham (1), Norfolk (3), North East Lincolnshire (3), North Lincolnshire (1), North Somerset (4), North Yorkshire (3), Northumberland (4), Nottingham City (4), Nottingham County (2), Oldham (4), Oxfordshire (4), Peterborough (1), Plymouth (4), Poole (3), Reading (4), Redbridge (3), Richmond (1), Rochdale (3), Rotherham (1), Rutland (4), Salford (4), Sandwell (3), Scilly Isles (4), Sheffield (2), Shropshire (1), Slough (2), Solihull (4), Somerset (4), South Glouster (2), Southampton (2), Southend (3), St Helens (4), Stockport (4), Suffolk (3), Surrey (2), Sutton (2), Swindon (2), Telford and Wrekin (2), Thurrock (4), Torbay (3), Trafford (2), Wakefield (3), Walsall (4), Waltham Forest (3), Wandsworth (4), Warrington (2), West Berkshire (2), West Sussex (3), Wigan (2), Wiltshire (2), Winsor and Maidenhead (2), Wirral (4), Wokingham (2), Wolverhampton (2), Worcestershire (4), York (3), All (323)

Balanced Panel of Local Authorities 2008-2010:

Barnsley, Bath and North East Somerset, Blackburn with Darwen, Bolton, Bradford, Brent, Bristol City, Bromley, Buckinghamshire, Calderdale, Camden, Croydon, Cumbria, Derbyshire, Doncaster, Dorset, Dudley, Durham, East Riding of Yorkshire, Essex, Greenwich, Hampshire, Havering, Hillingdon, Isle of Scilly, Isle of Wight, Islington, Kent, Kingston Upon Hull, Kingston Upon Thames, Kirklees, Lancashire, Leeds, Leicester, Lewisham, Medway, North East Lincolnshire, North Somerset, North Yorkshire, Northumberland, Nottingham City, Oldham, Oxfordshire, Plymouth, Poole, Reading, Redbridge, Rutland, Salford, Sandwell, Sicily Isles, Solihull, Somerset, Southend, St Helens, Stockport, Suffolk, Thurrock, Torbay, Wakefield, Walsall, Waltham forest, Wandsworth, West Sussex, Wirral, Worcestershire

Online Appendix Table 1: Union Membership by Teacher and Story School Type – Showing Quadratic Terms

Probability of Union Membership	Accusation Stories		All Story Types	
	Secondary School Teachers (1)	Primary School Teachers (2)	Secondary School Teachers (3)	Primary School Teachers (4)
Panel A: Relevant Stories				
Stories Regionally	0.803***	0.069	0.529***	0.128
	0.238	0.146	0.192	0.133
Stories Regionally Squared	-0.036**	-0.009	-0.020***	-0.009
	0.010	0.007	0.007	0.006
Panel B: Relevant Secondary School Stories				
Secondary Stories	1.002***	0.066	0.453*	0.154
	0.223	0.302	0.240	0.217
Secondary Stories Squared	-0.050**	-0.008	-0.021**	-0.009
	0.010	0.015	0.010	0.010
Panel C: Relevant Primary School Stories				
Primary Stories	0.092	0.699	-0.021	0.713*
	0.6563	0.670	0.450	0.352
Primary Stories Squared	0.037	-0.109*	0.069	-0.079*
	0.069	0.069	0.063	0.035
Observations	13,949	14,076	13,949	14,076

Source: QLFS 1993-2010 Notes: Estimates from a logit regression of individual decision to join a union on news stories. Reporting the marginal effects at mean. All coefficients and standard errors are multiplied by 100 for ease of interpretation. Estimates can be read a percentage change in probability. All estimates conditional on teacher characteristics Accusation stories are stories involving *Allegations, Being Sued and Criminal Activity*. Relevant Stories include both Extremely and Highly relevant news stories. Stories Regionally is a count for the number of news stories that originated in the region that the teacher resides in the previous 12 months. Standard errors, in *italics*, are clustered at the regional level.

Online Appendix Table 2: Union Membership by Teacher and Story School Type – Showing Quadratic Terms

Probability of Union Membership	Accusation Stories		All Story Types	
	Male Teachers (1)	Female Teachers (2)	Male Teachers (3)	Female Teachers (4)
Panel A: Relevant Stories				
Stories	0.067	0.606***	0.205	0.370***
	0.151	*0.199*	*0.174*	*0.135*
Stories Squared	-0.014**	-0.031**	-0.017**	-0.016**
	0.006	*0.009*	*0.006*	*0.005*
Panel B: Relevant Male Teacher Stories				
Male Stories	0.721*	1.100***	0.666**	0.606*
	0.398	*0.370*	*0.416*	*0.353*
Male Stories Squared	-0.105**	-0.151***	-0.068	-0.068
	0.047	*0.055*	*0.051*	*0.057*
Panel C: Relevant Female Teacher Stories				
Female Stories	-0.053	0.445	0.1117	0.159
	0.309	*0.412*	*0.212*	*0.220*
Female Stories Squared	-0.014	-0.029	-0.019*	-0.010
	0.016	*0.022*	*0.008*	*0.009*
Observations	8,361	22,031	8,361	22,031

Source: QLFS 1993-2010 Notes: Estimates from a logit regression of individual decision to join a union on news stories. Reporting the marginal effects at mean. All coefficients and standard errors are multiplied by 100 for ease of interpretation. Estimates can be read a percentage change in probability. All estimates conditional on teacher characteristics Accusation stories are stories involving *Allegations, Being Sued and Criminal Activity*. Relevant Stories include both Extremely and Highly relevant news stories. Stories Regionally is a count for the number of news stories that originated in the region that the teacher resides in the previous 12 months. Standard errors, in *italics*, are clustered at the regional level.