# Pluralistic Ignorance and Social Stigma

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# Abstract

Pluralistic ignorance, a discrepancy between private beliefs and public understanding of these beliefs, is a social phenomenon which has been shown to have significant welfare consequences, but relatively little is understood about its origins. In this paper, we propose social stigma as a potential driver of pluralistic ignorance and design a survey structure intended to test for a relationship between this stigma and pluralistic ignorance across sociopolitical issues. As we are without results, we survey the literature and produce a short theoretical framework to motivate the research design, and also describe future directions for the research project.

**Keywords:**   pluralistic ignorance, social stigma, misperceptions

**Author's Declaration:**   I acknowledge that, unless otherwise specified, all work is original work.

# Acknowledgements

# Contents

# 1.   Introduction

Pluralistic ignorance - a situation in which 'a majority of group members privately reject a norm, but incorrectly assume that most others accept it, and therefore go along with it' (Katz et al. 1931) - has been documented across a number of context important to economists and society at large. In domains such as tax reporting (Wenzel 2005), female labour market participation (Bursztyn et al. 2020b) and HIV treatment (Yu 2023), pluralistic ignorance has been shown to have significant consequences for wellbeing and these studies show that simply correcting these misperceptions can result in notable welfare improvements. While much scholarly attention has gone to resolving pluralistic ignorance (Bursztyn and Yang 2022), it remains an open question as to *why* this ignorance exists in the first place. Answering this question is crucial - unless we expect to be able to identify and correct every incidence of pluralistic ignorance, understanding what conditions allow it to thrive enable us to prevent the issue and the associated welfare loss in the first place.

A commonly proposed explanation for pluralistic ignorance is a story of norm updating lagging behind changing private preferences (Kuran 1989; Bicchieri 2005; Centola et al. 2005; Smerdon et al. 2020). While individual preferences change, the role of norms as a co-ordination device prevent these preferences from being publicly revealed. This leads to public declarations upholding the past preference and therefore inferences about the population distribution of beliefs are incorrectly skewed towards the previously-held position. While undoubtedly this explanation holds water in some contexts, it leaves open a deeper questions as to which contexts are subject to this conformity trap, and for which reasons.

This explanation also precludes the possibility of pluralistic ignorance over issues and contexts which have only recently entered the public sphere, where norms and positions are being established for the first time. Clearly, ignorance in this context cannot be explained as a consequence of previous norms. More general explanations are required to properly consider *where* and *why* ignorance may arise in these newer settings.

In this sense, a set of theoretical models that consider social image concerns provide a compelling argument. In these models, individuals face a trade-off between minimizing cognitive discomfort by revealing their true preference and maximizing esteem or minimizing stigma by publicly stating views that are more socially approved (Kuran 1987; Bernheim 1994; Bénabou and Tirole 2006; Ellingsen and Johannesson 2008; Bénabou and Tirole 2011; Michaeli and Spiro 2015, 2017; Ali and Bénabou 2020). In these models, social pressure leads to either pooling on socially optimal viewpoints or distortion of private preferences. In either case, public information does not reflect the underlying private distribution of views

and pluralistic ignorance can arise as a result of these distortions.[1] While the theoretical literature is rich in this regard, empirical evidence for this mechanism is lacking - to our knowledge, Braghieri (2021) is the only paper that empirically explores such a mechanism, and not in the context of exploring pluralistic ignorance.

In this dissertation, we introduce the first stage of a research project intended to fill this literature gap. We first seek to establish a relationship between the incidence of pluralistic ignorance and social stigma, which we define as the social disutility or penalty attached to an action, statement or belief (Moffitt 1983). Empirically establishing this relationship provides motivating evidence to further explore how stigma functions to generate pluralistic ignorance; for instance, how stigma relates to mechanisms proposed in the literature (Jackson 2019; Bursztyn et al. 2023) or directly introducing stigma into collective action experiments.

We first construct a model based on existing literature (Michaeli and Spiro 2017) to examine stigma. Particularly, we note that stigma functions that allow for ignorance through greater pooling are steeper around the point where stigma first affects utility. This result motivates the empirical design we use to test for this proposed relationship - stronger stigma is associated with greater pluralistic ignorance.

To test this relationship, we design a between-individual survey to measure the incidence of pluralistic ignorance and the degree of stigma which we intend to administer to undergraduates at the University of Nottingham. We estimate pluralistic ignorance by first eliciting private views about statements regarding various sociopolitical issues, then eliciting perceptions of agreement/disagreement on these issues among other participants. We estimate social stigma using the Krupka and Weber (2013) methodology, first eliciting personal views on the appropriateness of public agreement/disagreement with each statement, then eliciting the socially perceived level of appropriateness through incentivized Krupka-Weber matching. The battery of issues is designed to vary in levels of stigma - some statements are designed to have great differences in appropriateness between agreement and disagreement, others are intended to have very little. We intend to exploit this variation to test for our hypothesised relationship between stigma and pluralistic ignorance.

Taking this approach to stigma measurement allows us to also conduct exploratory analysis regarding pluralistic ignorance *over* stigma. By eliciting private and socially perceived views, we are able to measure whether stigma itself is misperceived and whether this has associations with the pluralistic ignorance over sociopolitical views our primary analysis is concerned with. This enables us to explore a hypothesized explanation from

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[1]We note the explanations we mention are simply the most discussed in the pluralistic ignorance literature, but not the only potential causes of misperceptions - for instance, Golman et al. (2016) propose an explanation where correcting misperceptions may require people to re-evaluate beliefs in a costly way and therefore individuals will selectively seek information that confirms their beliefs, maintaining pluralistic ignorance.

Bursztyn et al. (2020b), where misperceptions over social penalties prevents communication which allows for ignorance to persist over issues - female labour force participation in their case - and generates a cycle where misperceptions about social penalties are maintained by restricting communication.

We primarily speak to the literature regarding misperceptions about beliefs (see Bursztyn and Yang (2022) for a recent review of this literature). As previously mentioned, a number of empirical papers examine trends and consequences of misperceptions and also explore the effect of treatments aimed at correcting misperceptions, but empirical research into sources of misperceptions are scarce. We seek to contribute by introducing some of the first empirical research into sources of misperception and advance the literature in this direction. Naturally, we intend to relate more closely to other sections of the economics literature in further stages of research once initial results are established.

Shamir and Shamir (1997) is the paper that is closest to our own. The authors examine pluralistic ignorance across a variety of topics in Israel but examine correlations with media visibility rather than stigma to explore the likelihood of ignorance. They - perhaps unsurprisingly - show less information on an issue means less media visibility which also means more pluralistic ignorance. They also show the role the 1992 election played in updating beliefs and correcting ignorance. However, this explanation doesn't address *why* some topics allow more information in the public sphere than others? We consider stigma as a potential answer.

Braghieri (2021) is another of the papers closest to our research project. This paper also examines the incidence of stigma and social pressure over a battery of statements through the lens of political correctness. The author uses this to examine the ability of an audience to correctly draw inferences about beliefs from public statements subject to stigma and shows that onlookers are somewhat naive as to how social pressure distorts public expressions of opinions. His empirical findings can be seen to validate our theoretical hypothesis regarding stigma distorting public statements, but his paper avoids examining a potential relationship between pluralistic ignorance and stigma, where we intend to make our contribution.

Finally, Bursztyn et al. (2023) is the last paper that is most similar to ours. They examine misperceptions about gender norms in a cross-country survey spanning 60 countries. They show that while misperceptions are commonplace, the form they take is context-dependent based upon the perceived majority view. They highlight the role of inference errors as a potential explanation for ignorance, considering minority overweighting and stereotyping behaviour. Their approach can be seen as an analogue to ours - rather than examining ignorance on one topic across a variety of settings, we instead examine ignorance across a range of topics in one setting. However, we consider their explanation as complementary to

our own: we suggest increased stigma allows greater scope for inference errors to occur such that these cognitive distortions are a potential mechanism through which stigma can create pluralistic ignorance.

The rest of the paper proceeds as follows. Section 2 describes the relevant literature. Section 3 introduces the model from which we derive our hypothesis of interest. Section 4 describes the empirical approach we intend to take. Section 5 describes the direction of future research. Section 6 concludes.

# 2. Related Literature

## 2.1 Pluralistic Ignorance

The term 'pluralistic ignorance' was introduced to describe a situation in which 'a majority of group members privately reject a norm, but incorrectly assume that most others accept it, and therefore go along with it' by Katz et al. (1931) in their examination of college fraternity admission. One of the earliest and most well-known papers to empirically illustrate both the concept and potential consequences of pluralistic ignorance is O'Gorman (1975)'s study of the racial attitudes of white American adults in the 1960s. He shows with survey data that while most privately opposed segregation, white Americans overestimate the proportion of their peers who support segregation - to the point of incorrectly identifying the majority opinion in some cases - and the degree of this overestimation was associated with a willingness to support segregation in housing practices. Additional notable early work in the realm of pluralistic ignorance comes from work in social psychology studying attitudes on college campuses (Prentice and Miller 1993, 1996).

While earlier work on pluralistic ignorance came predominantly from social psychology, recently the economics discipline has explored both the incidence and the consequences of pluralistic ignorance in a variety of contexts, particularly in contexts that have notable impacts for welfare. This literature relates closely to the literature on information treatments and norm-focused interventions - in examining the effects of correcting misperceptions through information provision, many papers in this literature document cases of pluralistic ignorance.[1]

Wenzel (2005) is an important early paper in this regard which shows that Australian taxpayers expect others to be more accepting of tax-evading behaviours than they themselves are. Wenzel also tests the impact of correcting this misperception and shows being correctly informed is associated with reduced deduction claims. More recently, Bursztyn et al. (2020b) study pluralistic ignorance among married men in Saudi Arabia with respect to their views on women working outside the home. They show that men privately are accepting of their spouse joining the labour force but many underestimate their proportion of their neighbours who hold the same view. They also test the impact of correcting this misperception and show this treatment increases labour supply of the spouse through increased applications and interviews for work outside the home showing pluralistic

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[1]While I note specific papers that document pluralistic ignorance, Bursztyn and Yang (2022)'s review of misperception research in top social science journals and Haaland et al. (2023)'s review of experimental research using information provision provide good overviews of this literature.

ignorance has direct impacts on labour market decisions and female labour force participation, settings which have particularly large welfare implications. Other domains where pluralistic ignorance has been documented include beliefs about affirmative action (Van Boven 2000; Bursztyn et al. 2023), climate change (Mildenberger and Tingley 2019), donation behaviours (Frey and Meier 2004), HIV prevention behaviour (Yu 2023) and political partisanship (Ahler 2014).

From a theoretical perspective, a number of explanations are proposed through models that aim to capture the underlying social dynamics that can result in pluralistic ignorance. The approach most in line with the original definition of pluralistic ignorance functions in the context of norm evolution. The idea here is that despite private opinions changing, the role of a norm as a co-ordination device leads people to espouse the socially approved view in public as they believe others continue to support it. This pluralistic ignorance results in norms persisting despite popular support. Kuran (1989) develops a model to describe such a mechanism, using the Iranian Revolution as an illustrative example. Other explorations of this mechanism include Chwe (1999), Centola et al. (2005), and Bicchieri (2005).

A recent theoretical paper, Fernández-Duque (2022), addresses pluralistic ignorance directly using a definition that draws on the literature above. Fernández-Duque explores factors that influence the probability of pluralistic ignorance using a model of sequential revelation of information. He focuses on the dimension of group size and second-order uncertainty[2] and finds group size effects which conditions permit more pluralistic ignorance - the probability is maximized when second-order uncertainty is moderate, but low uncertainty allows the minimum probability of ignorance in large groups whereas high uncertainty minimizes the probability in small groups. Fernández-Duque also notes that a number of questions remain open, both theoretically and empirically, as to the origins of pluralistic ignorance and the circumstances that permit it.

Much of the experimental literature examining pluralistic ignorance also operates through this lens - to my knowledge, three existing papers experimentally explore different aspects of pluralistic ignorance of this kind by implementing exogenous preference switches in co-ordination games. Smerdon et al. (2020) show pluralistic ignorance inhibits norm change - they find allowing for communication in their co-ordination games allows for switching between equilibria almost as if complete information on private preferences was provided, whereas the original equilibrium persists with zero-information treatments. Duffy and Lafky (2021) show higher incentives for conformity lead to longer persistence of existing norms, but also swifter transitions between norms. Finally, Andreoni et al. (2021) derive testable

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[2]Fernández-Duque defines this as uncertainty over the composition of the population from which a group is formed.

predictions about threshold models of norm change, varying their predicted threshold by adjusting the benefits of change and penalties attached to miscoordination. They show that higher benefits and lower penalties both lower the threshold for change, suggesting the opposite invites greater pluralistic ignorance. They also show that providing avenues for information (in the form of non-binding preference polls) reduces the likelihood of pluralistic ignorance and allows for norm change.

Other approaches in the economics literature step away from examining norm change directly and explore the role of social image concerns in generating pluralistic ignorance. The idea we put forward here is that individuals distort their true views in public as a result of social pressure or stigma, leading the true population distribution of opinions to be distorted. Theoretical approaches such as Kuran's model of preference falsification (1987; 1989; 1997) and Michaeli and Spiro (2015, 2017) directly speak to this mechanism in modelling trade-offs between maximizing relative to personal and social bliss points for actions or beliefs. Further, Michaeli and Spiro (2017) construct a model with endogenous norm formation to explore which conditions are more favourable to biased norms far from the average taste - misunderstanding of the norm forming the basis for pluralistic ignorance. A similar set of models address situations where individuals distort their views in public not necessarily as a result of pressure, but also to signal a particular type in order to achieve status, such as Bernheim (1994), Bénabou and Tirole (2006), Bénabou and Tirole (2011), Ellingsen and Johannesson (2008), and Ali and Bénabou (2020).

Braghieri (2021) builds upon this theoretical work by constructing a signalling model to analyse the relationship between these social image concerns and information loss in order to construct an experiment to evaluate the extent to which information loss does occur. Braghieri elicits the level of agreement from undergraduate students on a variety of socio-political topics with students told their answers would be shared in a future stage of the experiment - one group was told their answers would be aggregated and hence anonymous, while another was told their individual responses would be shown. He first shows student answers are significantly different across treatments on sensitive topics whereas this is not the case for more benign statements. While his theoretical model shows that these distortions do not necessarily result in information loss, the empirical results show students are at least somewhat naive as to how social image concerns affect public statements. This naivety leaves scope for misperceptions and pluralistic ignorance to form.

Another set of explanations regarding pluralistic ignorance relate to errors or biases in the information that is held about a topic or its use in estimating true population support. For instance, Jackson (2019) show that when networks are endogenously formed and have complementarities with behaviours lead to those with the greatest personal preference for the

behaviour to form more network links. This leads to higher visibility for individuals with the greatest preference for the behaviour, which means perceptions of the extent of the preference are biased towards the network-forming preference. Another example of a mechanism in this vein comes from Bursztyn et al. (2023), who propose a combination of minority overweighting and stereotype effects to explain the global pattern of misperception related to gender norms and views on affirmative action. These avenues no doubt have some explanatory power, but we argue these would operate on a different dimension and so therefore are not directly competing with explanations related to social image concerns.

## 2.2  Social Stigma

The classic definition of stigma comes from Goffman (1963) who defines stigma as an attribute that is tainting and discrediting when one is known to possess it. However, Goffman notes the contextual aspect of stigma also - an attribute may be stigmatizing in one scenario and not another. Indeed, more recent work in psychology notes this dimension to social stigma (Major and O'Brien 2005; Frost 2011).

While much of the research into stigma lies in psychology and sociology, economics has concerned itself with exploring the consequences of stigma. However, much of the economics research on interpersonal stigma is concerned with stigma attached to economic activities or programs, such as welfare stigma (Moffitt 1983; Yaniv 1997), sex work stigma (Ghosal et al. 2022), and unemployment stigma (Lynch 1989; Oberholzer-Gee 2008). Concerns with social stigma in the way we relate it to sociopolitical views aligns more with the literature on preference falsification and social image concerns previously discussed.

A pair of papers relate to the current work in their examination of misperceptions around stigma. First, Casal and Mittone (2016) examine the effects of reward and stigma policies in an income reporting game. While they note stigma is a stronger punishment, they also show that individuals attach greater stigma to their own tax evasion behaviours than similar behaviours taken by others. Second, Yu (2023) explores how social stigma affects uptake of HIV testing in Mozambique. He shows individuals systematically overestimate the amount of stigma individuals will hold towards people who take HIV tests, and show that correcting this misperception increases the rate of testing.

# 3. Model

## 3.1 The Model

Consider the following set-up. An individual's true (private) view on a topic is $t_i$ which is distributed on $[0,1]$ by a continuous distribution $P(.)$, with $\frac{1}{2}$ included in its support and $P(t_i \leq 1) = P(t_i \geq 0) = 1$. Each individual must also choose a view $s_i \in [0,1]$ to express in public.

Utility is given by:

$$U_i = -\frac{1}{2}(t_i - s_i)^2 - K(s_i) \tag{3.1}$$

The first term, $-\frac{1}{2}(t_i - s_i)^2$, represent an individual's preference to reveal their true position.[1] The quadratic nature of this term is a standard assumption in this literature (Kuran and Sandholm 2008; Acemoglu and Jackson 2017). The second term is a stigma function that assigns a social penalty to a given statement $s_i$. In particular, stigma is given by:

$$K(s_i) = \begin{cases} 0 & \text{if } s_i \leq \frac{1}{2} \\ \beta(s_i - \frac{1}{2}) & \text{if } s_i > \frac{1}{2} \end{cases} \tag{3.2}$$

for some $\beta > 0$. Opinions up to $s_i = \frac{1}{2}$ carry no social penalty - this can be understood as the opinion viewed as socially predominant. Opinions such that $s_i > \frac{1}{2}$ carry a social penalty that increases in the difference between $s_i$ and $\frac{1}{2}$ - more extreme off-norm opinions yield stronger penalties.

Utility maximization with respect to the public statement $s_i$ gives:

$$s_i = \begin{cases} t_i & \text{if } t_i \leq \frac{1}{2} \\ \frac{1}{2} & \text{if } t_i \in (\frac{1}{2}, \frac{1}{2} + \beta] \\ t_i - \beta & \text{if } t_i > \frac{1}{2} + \beta \end{cases} \tag{3.3}$$

Suppose we are interested in assessing $P(t_i \leq \frac{1}{2})$. The share of $s_i \leq \frac{1}{2}$ is equal to $P(t_i \leq \frac{1}{2} + \beta)$. This implies in the presence of stigma, observers cannot infer the true value of $P(t_i \leq \frac{1}{2})$ from expressed opinions, and that steeper stigma functions (higher $\beta$) imply greater distortion.

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[1] Abeler et al. (2019) combine data from a number of experimental studies and show a preference for honesty exists at some level.

### 3.1.1   A Note on One-Half: Neutrality and Indifference

In the model above, we assign the point $s_i = \frac{1}{2}$ to the unstigmatized set of opinions. In a setting where we take the bounds of the domain to be the strongest possible agreement or disagreement with a statement, as is the case in our empirical approach, this point represents neutrality or indifference. In this case, the assumption of $s_i = \frac{1}{2}$ carrying zero social penalty may be more justifiable on some topics than others. For instance, if the topic being considered is the implementation of measures to prevent harassment in a workplace, being indifferent in such a discussion could be perceived as enabling harassment, which could reasonably carry a social penalty.

Here we simply note that the specific assumption regarding how $s_i = \frac{1}{2}$ is treated makes little qualitative difference to the model. References to $\frac{1}{2}$ in the presented version of the model can simply be adjusted to the maximum value of $s_i$ that is less than $\frac{1}{2}$. While this changes the point at which pooling occurs and pluralistic ignorance is assessed around, the result remains the same - individuals cannot infer the true value of $P(s_i < \frac{1}{2})$ as pooling occurs in this domain, and steeper stigma functions still induce greater amounts of pooling. Therefore, throughout the paper we maintain the convention that $s_i = \frac{1}{2}$ carries no penalty.

The empirical strategy is adjusted to remain agnostic about this assumption as we discuss in later sections.

## 3.2   Discussion

The model adapts from Michaeli and Spiro (2017) in order to focus on specific features of our context - particularly, the slope attached to stigma around the discontinuity moving from agreement to disagreement on a topic.

Michaeli and Spiro (2015) and Michaeli and Spiro (2017) show that non-concave stigma functions lead to separating equilibria and full type revelation, while concave stigma functions lead to pooling equilibria and hence pluralistic ignorance in our context. A notable feature of this set-up is that in convex settings, the stigma functions and the gradient approaches zero as the function reaches its origin point - in our case, the discontinuity at what we call $\frac{1}{2}$. In concave settings however, this is not the case and functions get steeper as they approach the origin. We simplify our function to focus this feature of their approach, as we exploit this in our research design when measuring stigma to identify when stigma is relatively stronger on one topic as compared to another. This leads to the following hypothesis which forms the basis for the empirical approach:

**Hypothesis:** The difference between the perceived and real share of people who agree with a given statement is increasing in the slope of the stigma function associated with that statement around the change-point from agreeable to disagreeable opinions.

The logic should be clear from the previous paragraph - stigma functions that induce greater pooling are steeper at the initial discontinuity where stigma begins to affect utility. Greater pooling makes it more difficult to assess the true population distribution of views leading to greater discrepancy between perception and reality when it comes to assessing the proportion of population who agree with the statement.

We follow the strand of the pairwise social interaction literature where payoffs depend on actions or statements directly (Kuran and Sandholm 2008; Michaeli and Spiro 2015, 2017) rather than on inferences about types conditional on the choice of action or statement (Kuran 1989; Bernheim 1994; Bénabou and Tirole 2006). We do this for two reasons.

First and most importantly, while the inference-focused literature may shed light on *why* stigma functions take a particular shape for a given issue or topic, this is not of primary interest to us in the current study. We take the existence of the stigma function as a primitive and characterise how individuals react to stigma. Specifically, we seek to establish whether a relationship exists between the shape of stigma and the incidence of pluralistic ignorance through an examination across issues - understanding the reason why stigma functions take particular shapes is not necessary to examine the existence (or lack thereof) of such a relationship and therefore is not the focus of this research.

The other main reason is that, given our interest is in self-reported positions on a spectrum rather than actions, relatively tame assumptions about inferences allow us to justify modelling based upon actions to allow for tractability.

One example of such an assumption is Bernheim (1994)'s own example of naivety of the audience whereby onlookers interpret the statement as directly reflective of the internal bliss point. Further, Braghieri (2021) show that others are partially naive about the extent to which public statements reflect private views - the partial nature can be captured within our $\beta$ term.

One can also note that it is never optimal for an individual to make a statement that falls outside the interval between their own private opinion and the $\frac{1}{2}$ point where stigma is minimized. Given this, an onlooker could justifiably interpret an individual's statement as the closest their type could possibly be to $\frac{1}{2}$ - those holding some variant of the socially accepted opinion report it truly and those who hold a stigmatized opinion will always underreport their opinion relative to $\frac{1}{2}$ in our model. If the assumption is made that stigma is minimized at the normative view and is strictly non-decreasing in distance from this norm (a standard

assumption in this literature), then working directly with statements is effectively the same as working with inferences. This approach does require assumptions about shape to be imposed on the stigma function by working with the statements directly, but as discussed in previous paragraphs, we are not interested in which shape the stigma function takes for a particular topic and we simply take the shape as given. As such, using statements directly in the function improves tractability at negligible cost when assessing the research question at hand.

# 4.   Research Design

In this section, I describe the design of the surveys we intend to run to measure both pluralistic ignorance and (both real and perceived) stigma. I also describe the measures we intend to use to statistically test our hypothesis generated in the previous section.

## 4.1   Survey Instruments

The research approach for this project involves running one survey to elicit both private opinions and perceived population opinions across a battery of socio-political topics to measure pluralistic ignorance. A second survey run concurrently will measure first- and second-order beliefs about the social appropriateness of particular views about the same statements in order to create measures for stigma, both real and perceived. The survey will provide contextual information about statements where needed in order to clarify terms. The list of topics can be found in Appendix Table A1.

Statements are either adapted or derived from existing research in the literature on pluralistic ignorance and misperceptions (Mildenberger and Tingley 2019; Braghieri 2021; Bursztyn et al. 2023) or derive from YouGov surveys intended to gauge political attitudes in the general population (YouGov 2023). The battery of topics is also designed to vary in the degree of stigma we believe will be attached to the minority view on each statement. On one extreme, agreeing with the minority view on the statement should be associated with high amounts of stigma. On the other extreme, taking either view on the statement is equally appropriate and effectively zero stigma is attached to the minority response. We intend to validate these assumptions regarding the stigma attached to each statement with a pilot survey prior to running the surveys used to collect data for the main analysis.

The subject pool will consist of solely undergraduate students from the University of Nottingham. The restriction on the sample pool is preferred such that the reference group used when answering questions about population parameters is clear and consistent across subjects. Additionally, given the socio-political nature of the statements, the sample will be restricted to domestic students. Finally, no subject will be involved in multiple surveys - the stigma and pluralistic ignorance surveys will be run on separate subjects from the same population in order to avoid issues of consistency bias across answers. All participants will fill out a demographic questionnaire regardless of their allocated survey - we follow Braghieri (2021) in collecting information about self-assessed political associations and news consumption alongside standard demographic information.

Examples for each of the following surveys are contained in Appendix 6.

### 4.1.1 Survey 1: Pluralistic Ignorance

The first survey concerns pluralistic ignorance and therefore we elicit information about opinions directly about the topic of each statement.

First, we ask directly for the subject's view on each topic using a 5-point Likert scale. The points on our scale take a standard form, asking whether subjects agree or disagree to a moderate or strong extent, with a central point for neutrality.

We also elicit perceptions about the level of support for a given position in the subject pool in order to assess the level of pluralistic ignorance. We tell participants that other students will be asked the same set of questions as they have been asked. We ask them to consider 100 participants, and ask them to estimate the number of these 100 participants who (i) agree to any extent, (ii) disagree to any extent, and (iii) indicate disinterest in the topic of the statement. We intend to incentivise this question by randomly selecting a number of guesses and paying out experimental points subject to a rule borrowed and adjusted from Braghieri (2021): $y = \max\{25 - (x - g)^2, 0\}$ where $y$ is the experimental currency, $x$ is the true population proportion calculated from the Likert responses, and $g$ is the estimate provided as an answer to this question. Payout is maximized when estimates are exactly correct and reduces until guesses are more than 5 percentage points out, at which 0 points are earned. Exact conversion from experimental points to actual currency is yet to be determined and is subject to funding.

Social desirability bias is a potential concern given the sensitive nature of some statements. Particularly since we are interested in pluralistic ignorance and misperceptions, we want to be sure that results are truly representative of misperceptions and not an artefact of experimental demand factors. One measure we take to manage this is to randomize the wording of the second set of questions related to population proportions as in Bursztyn et al. (2023). In the 'Response' treatment, we simply ask how many of the 100 random participants "will indicate they agree/disagree/do not care" about a given statement. In the 'Truthful' treatment, participants are instead asked how many of the 100 participants they think will *truly* agree/disagree/not care, regardless of the response they provided in the first part of the survey. As Bursztyn et al. (2023) note, if participants are responding to perceived experimenter demand or social desirability bias by distorting their answers, they should anticipate others will also do so and we would then expect a difference in responses between the two versions of the question. This allows us to understand whether these factors drive our result.[1]

While subjects will be anonymous and this anonymity will be emphasized in survey

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[1]This approach also provides value in assessing whether and to what extent participants are defaulting to selecting the neutral response.

materials they receive, we don't intend to employ additional design features to account for these effects beyond the aforementioned randomization in the second set of questions. Bursztyn et al. (2020b) and Bursztyn et al. (2023) show that direct elicitation and methods that provide cover for participants yield no significant difference in measured opinions on politically sensitive statements in other contexts.

### 4.1.2 Survey 2: Social Stigma

The second survey concerns measurements of social stigma and therefore we elicit ratings of social appropriateness regarding statements. Particularly, we ask for social appropriateness ratings attached to expressing the opinions that can be expressed in Survey 1 about the same battery of topics.

First, we ask for personal ratings of social appropriateness. For each statement, subjects are provided with each of the 5 possible responses that Survey 1 participants were able to give. The Survey 2 subjects are then asked to rate the social appropriateness of each response on another 5-point Likert scale. In this instance, the middle point does not represent indifference but rather an outside option - an indicator that the statement has no bearing on social appropriateness - whereas other points represent social (in)appropriateness, again to a moderate or strong extent.

In order to understand the socially understood level of stigma however, we also ask about second-order beliefs of social appropriateness. Following Krupka and Weber (2013)'s method of identifying social norms, we ask about what participants believe the most selected rating of social appropriateness for each possible response to each statement.[2] This selection is incentivised in the typical manner - survey items will be randomly selected and correct answers on the randomly selcted items will paid out.

## 4.2 Hypothesis Measurement

Here I describe the measures we intend to construct from the data in order to test the hypothesis derived from the model.

### 4.2.1 Pluralistic Ignorance

On an individual level, we create a measure of pluralistic ignorance by standardizing the deviation between the participant's estimate of the approval for a statement and the true

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[2] Nosenzo et al. (2022) use this approach to measure stigma on behaviour in an experimental setting.

population approval. Denote the participant's estimate function as E(.). Pluralistic ignorance is then defined as:

$$Z_{i,s} = \frac{E_{i,s}(t_i \leq \frac{1}{2}) - P_s(t_i \leq \frac{1}{2})}{\sigma_{P,s}}$$

where $\sigma_{P,s}$ is the standard deviation in expressed views on statement s.

Individual incidence of pluralistic ignorance can therefore be measured by a binary measure, with the indicator taking the value of 1 when $Z$ exceeds a chosen threshold (call this threshold $t$), implying that the difference is great enough to constitute ignorance. The degree of pluralistic ignorance is simply $Z$ - higher $Z$ implies a greater degree of pluralistic ignorance. Both approaches will be used in hypothesis testing for robustness.

### 4.2.2   Social Stigma

First, denote the social appropriateness ratings attached to the least strong agreement position, the indifference position and the least strong disagreement position for statement s as $SA_s^a$, $SA_s^i$ and $SA_s^d$ respectively.

We define the slope of the stigma function around the change-point for statement s as

$$S_s' = \max\left\{|SA_s^a - SA_s^i|, |SA_s^i - SA_s^d|\right\}$$

Taking the absolute value is used to frame the outcome in terms of the hypothesis - higher values of $S_s'$ imply steeper stigma functions around the change-point should be associated with higher values of pluralistic ignorance.

This can be visually represented using Figures 4.1 and 4.2 respectively. In Figure 4.1, the difference in social appropriateness between the points 'Moderately Agree', Neither Agree Nor Disagree' and 'Moderately Disagree' are relatively small, indicating convex stigma attached to disagreement with relatively low stigma assigned to slight disagreement. In Figure 4.2 however, these distance are much larger, indicating more concave stigma and hence stronger stigma attached to slight disagreement. Another note in these figures is that the normative view in both cases is associated to agreeing with the statement - no adjustment is needed where this is not the case.

The use of the maximization function relates to Section 3.1.1. Using a maximization function allows us to remain agnostic as to how indifference is socially perceived on a given topic, particularly as this is difficult to predict ex-ante.
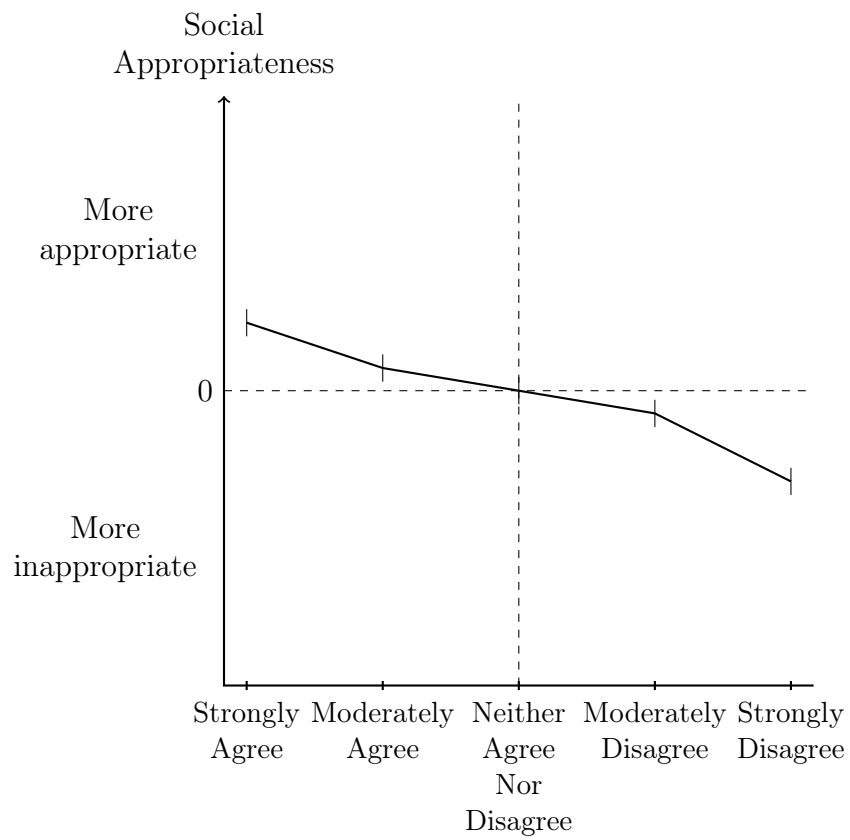
16

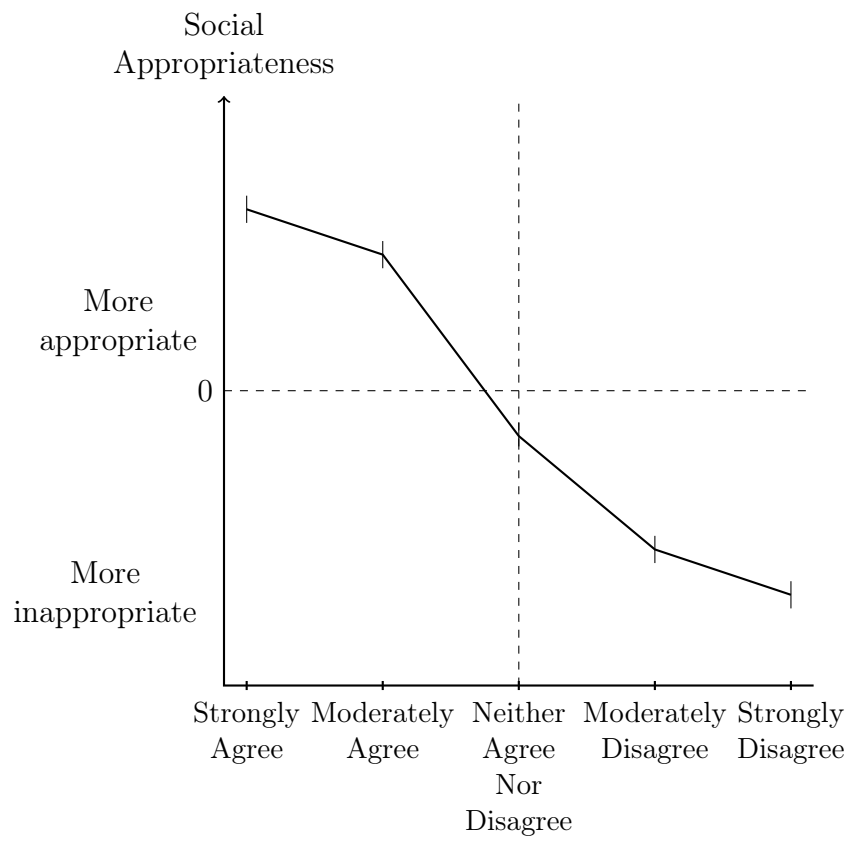Figure 4.1: High stigma - expect low pluralistic ignorance.

Figure 4.2: High stigma - expect high pluralistic ignorance.

### 4.2.3 Testing Hypothesis

Two regressions are used to test the hypothesis based on different statistical definitions of ignorance.

For the cut-off approach to ignorance, we use the following logistic regression for statement s:

$$\mathbf{1}_{i,s}^{+}(Z_{i,s} \geq t) = \gamma_0 + \gamma_1 S_s' + \gamma_2 X_i' + \epsilon$$

where $X_i'$ is a vector of relevant controls from the demographic survey. The hypothesis is then assessed through the t-test:

$$H_0 : \gamma_1 = 0$$

For the continuous approach to ignorance, we use the following linear regression for statement s:

$$Z_{i,s} = \beta_0 + \beta_1 S_s' + \beta_2 X_i' + \epsilon$$

The hypothesis is then assessed through the t-test:

$$H_0 : \beta_1 = 0$$

In each case, rejection of the null implies confirmation of the theoretical prediction.

## 4.3 Exploratory Analyses

Another open question in regard to the relationship between stigma and pluralistic ignorance on a particular topic is how well individuals understand the stigma function. There are two ways to consider this. Firstly, we can compare an aggregate of the personal stigma functions and compare this with the Kupka-Weber constructed social stigma function to understand the degree of pluralistic ignorance directly regarding stigma, and examine whether ignorance over stigma predicts ignorance over beliefs.

Additionally, one can easily envision a situation where while we calculate average stigma as moderate-to-low, significant spread exists in the distribution of perceived stigma which leads a portion of the population to refrain from discussion. We can examine relationships exist between distributional measures in our social stigma measurement and ignorance. Both approaches can provide motivating evidence for examining the impact of belief correction at a stigma level. [3]

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[3]Yu (2023) considers this relation in the context of HIV prevention in Mozambique.

# 5. Future Research Agenda

Establishing a relationship between stigma and pluralistic ignorance is an initial step towards future work and experiment designs intended to further explore the origins of pluralistic ignorance and how it interacts with economically relevant variables. In this section, we describe two avenues for research from which we intend to draw from the future findings of the project described previously in this dissertation.

## 5.1 Distinguishing between causes

While we examine stigma specifically in the first stage of the project, we note there are a variety of potential explanations for pluralistic ignorance proposed in the literature. Attempting to delineate which explanations play larger roles in a given context is an interesting question and is important if the intent is to implement a policy solution.

An interesting distinction in proposed explanations lies between the set of explanations that focus on restricted information and communication (previously discussed, social image concerns such as stigma and esteem, selective information-seeking, or lack of visibility or interest) and those that deal with how limited information is misused (Jackson 2019; Bursztyn et al. 2023). These two categories can be seen not as competing, but rather as complementary explanations - the argument that reduced information increases the scope for both sampling biases in the little information that is held and inference biases in using this information comes naturally. As such, one could consider these selection and extrapolation issues as the mechanism through which stigma *causes* pluralistic ignorance.

If we can establish a relationship between stigma and pluralistic ignorance, a natural next step is to investigate these mechanisms as a possible driver. Testing for a relationship between stigma and occurrence of inference biases can shed light on how stigma functions to cause misperception. For instance, Bursztyn et al. (2023) propose the concurrent impact of minority overweighting and gender stereotyping as an explanation for the global patterns in misperceptions about gender norms they document, and provide measures for each of these forces in the countries they collect data for. If we consider these forces as mechanism for stigma, a natural test would be to estimate the stigma attached to conversations around gender norms in each country and test for a relationship between stigma and these forces. [1] Investigations of this kind are of particular interest for further steps of this project.

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[1] It's notable in this instance that Bursztyn et al. (2023)'s figure for minority overweighting shows an S-shaped pattern between actual and perceived support - this implies minority overweighting is highest in countries with a large majority such that a socially dominant view is clear, which we would suggest leads to greater stigma on the minority.

## 5.2   Stigma in collective action

Given the role pluralistic ignorance has being shown to play in constricting norm and behavioural change (O'Gorman 1975; Bursztyn et al. 2020b), identifying a relationship between stigma and pluralistic ignorance provides a basis for directly investigating the role of stigma in norm change. To this end, we would be able to address questions examining how strong stigma must be to notably harm welfare.

One approach to examining this question comes from models on protest. Barbera and Jackson (2019) propose a model of collective action where payoffs rely on meeting a threshold for participation, which hinges on individual beliefs about other's as a result. They then allow for the possibility of learning and show how different amounts of information can either help or hinder participation and consider the role of homophily in learning. While an experimental test of their model would be illuminating in and of itself, their model defines the amount of learning done exogenously in order to explore the effects of particular amounts of information. Allowing information to be gathered endogenously subject to constraints is of interest in understanding how potential collective action can be encouraged or suppressed.

In this vein, stigma provides an interesting dimension to examine endogenous learning choices if we can establish a relationship with pluralistic ignorance. In the context of the model, pluralistic ignorance would impact the belief individuals have about other's participation, potentially hindering their own (Bursztyn et al. 2021). Additionally, while Barbera and Jackson (2019) examine collective action in the context of protests, one could recontextualize the model to apply to situations where any sufficiently large action leads individuals to update their beliefs about the normative position in society.[2] As such, allowing learning to be governed by a stigma function such as the one we use to motivate in this dissertation may be instructive in understanding what forms stigma would need to take in order to hinder collective action and norm change - an open question for future research.

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[2]This is consistent with evidence that people update beliefs and actions in light of surprising election results, such as the Brexit referendum (Albornoz et al. 2022) or the 2016 US presidential election (Bursztyn et al. 2020a).

# 6. Conclusion

The origins of pluralistic ignorance remain an open question in research, especially in empirical settings. Understanding which conditions and mechanism lead pluralistic ignorance to arise is an important research given the links established in existing studies between pluralistic ignorance and numerous important social contexts.

We propose that social stigma is a fundamental driver of pluralistic ignorance through its ability to distort public statements, creating a wedge between private views and these public declarations. We design a pair of surveys intended to measure both pluralistic ignorance and social stigma across a battery of sociopolitical issues specific to a UK context. We motivate our approach both through the existing literature and with a brief theoretical model.

This paper is a first step in a larger overall project intended to explore the causes of pluralistic ignorance. We intend to use the relationship we derive in this stage of the project to motivate future work. The ultimate goal of our project is to identify causes of pluralistic ignorance through experimental work, and to establish clean tests that allow us to distinguish cleanly between contextual factors that drive pluralistic ignorance. Such a result would represent a significant step forward in the literature on pluralistic ignorance and misperceptions in general, and in turn open further research directions in examining these factors in field settings to explore prevention of misperceptions.

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# Appendix: Survey Topics and Materials Drafts

## A1.1 Draft Statements

Table A1: List of Proposed Statements

| Statement | |
|---|---|
| 1 | The government and companies should give priority to women when hiring for leadership positions (Bursztyn et al. 2023) |
| 2 | People who immigrated to the U.K. illegally, when caught, should be deported and sent back to their countries of origin (Braghieri 2021) |
| 3 | The Islamic religion is more likely than other religions to encourage violence among its believers (Braghieri 2021). |
| 4 | Sexual harassment training should be mandated for anyone who works or studies at the University of Nottingham (Braghieri 2021). |
| 5 | The University of Nottingham should require professors to address students according to the students' preferred gender pronouns (Braghieri 2021). |
| 6 | The University of Nottingham should require professors to use trigger warnings in their classes (Braghieri 2021). |
| 7 | Scotland should become an independent country from the United Kingdom (YouGov 2023). |
| 8 | The British monarchy should be abolished. |
| 9 | Climate change is occurring as a result of human activity (Mildenberger and Tingley 2019). |
| 10 | Assisted suicide should be legal for individuals suffering from a terminal illness (YouGov 2023). |
| 11 | People from ethnic minority backgrounds face more workplace discrimination than white Britons (YouGov 2023). |
| 12 | Single-sex schools are a valuable part of the British education system (YouGov 2023). |
| 13 | Parents should limit the amount of time their kids spend on their smartphones (Braghieri 2021). |
| 14 | The United Kingdom should increase tariffs on foreign imports (Braghieri 2021). |
| 15 | The United Kingdom should move to allow only cashless payments. |

Citations denote where statements have been drawn from previous research or other sources.

# A1.2 Draft Survey Materials

The following is intended to provide an example of the survey materials we intend to provide for the primary surveys. This section is also written with reference to one example statement - we simply reproduce the following for each statement to construct the full survey.

## A1.2.1 Pluralistic Ignorance Measurement

### Eliciting Private Opinions

*'Consider the following statement(s). Please select the option which best reflects your personal view on each statement.'*

| Statement | Strongly Agree | Moderately Agree | Neither Agree Nor Disagree | Moderately Disagree | Strongly Disagree |
|---|---|---|---|---|---|
| The University of Nottingham should require professors to address students according to the students' preferred gender pronouns. | ◯ | ◯ | ◯ | ◯ | ◯ |

### Eliciting Estimates of Public Opinion

In this section, subjects are provided with the statement. Attached to each statement are boxes in which subjects type their responses from 0-100.

*'We also asked other University of Nottingham students about their view on the same statements.*

*Imagine 100 random students who were asked about these issues.*

*Consider the following statement.*

The University of Nottingham should require professors to address students according to the students' preferred gender pronouns.

*Please indicate how many students you think will have provided each of the responses below. The total of your answers must sum to 100.*

Strongly Agree

Moderately Agree

Neither Agree nor Disagree

Moderately Disagree

Strongly Disagree

Alternate text for social desirability bias check:

*'We also asked other University of Nottingham students about their view on the same statements.*

*Imagine 100 random students who were asked about these issues.*

*Consider the following statement.*

The University of Nottingham should require professors to address students according to the students' preferred gender pronouns.

*Please indicate how many students you think will have provided each of the responses below. The total of your answers must sum to 100.*

## A1.2.2 Stigma Measurement

**Eliciting Private View on Stigma**

*Consider the following statement.*

The University of Nottingham should require professors to address students according to the students' preferred gender pronouns.

*For each of the provided responses indicating the extent to which a person might agree or disagree with the statement, how socially appropriate do you believe it would be for a University of Nottingham student to express this view?*

|  | Very Socially Appropriate | Somewhat Socially Appropriate | Somewhat Socially Inappropriate | Very Socially Inappropriate | No Bearing On Social Appropriateness |
|---|---|---|---|---|---|
| Strongly Agree | ○ | ○ | ○ | ○ | ○ |
| Moderately Agree | ○ | ○ | ○ | ○ | ○ |
| Neither Agree Nor Disagree | ○ | ○ | ○ | ○ | ○ |
| Moderately Disagree | ○ | ○ | ○ | ○ | ○ |
| Strongly Disagree | ○ | ○ | ○ | ○ | ○ |

**Eliciting Second Order Belief of Stigma**

*Other University of Nottingham students were also presented with the following statement.*

The University of Nottingham should require professors to address students according to the students' preferred gender pronouns.

*These students were then also asked to assess the appropriateness of expressing 4 different levels of agreement or disagreement with the statement.*

*For each of the provided levels of agreement, please select the appropriateness rating you believe was chosen most often among all University of Nottingham students who were asked to provide a rating.*

|  | Very Socially Appropriate | Somewhat Socially Appropriate | Somewhat Socially Inappropriate | Very Socially Inappropriate | No Bearing On Social Appropriateness |
|---|:---:|:---:|:---:|:---:|:---:|
| Strongly Agree | ○ | ○ | ○ | ○ | ○ |
| Moderately Agree | ○ | ○ | ○ | ○ | ○ |
| Neither Agree Nor Disagree | ○ | ○ | ○ | ○ | ○ |
| Moderately Disagree | ○ | ○ | ○ | ○ | ○ |
| Strongly Disagree | ○ | ○ | ○ | ○ | ○ |

The intention here is to take Krupka-Weber measures in order to identify the socially understood level of stigma attached to each response.