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ARTICLE

Blame it on her 'baby brain'? Investigating the contents of social stereotypes about pregnant women's warmth and competence

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Abstract

The Stereotype Content Model proposes that social stereotypes broadly exist along two dimensions: warmth and competence. This framework has been used to investigate the contents of stereotypes of gendered groups in a range of contexts. However, it has not been extensively applied to perceptions of pregnant women. This is important, given how pregnant women are typically framed by society to have 'baby brain' or reduced competence. Therefore, we investigated the contents of social stereotypes of pregnant women. In Study 1, participants (N = 590) rated a target group (pregnant women) and thirteen other comparison groups on perceptions of warmth (compassion, empathy and comfort) and competence (mathematics ability, logic and memory). Pregnant women were generally stereotyped to have low competence and high warmth, relative to other groups. Study 2 (N = 54) then descriptively investigated the wider contents of stereotypes related to pregnant women, new mothers, men and women using a trait generation task. Generated traits were coded within the dimensions of warmth and competence. This showed, again, that pregnant women were assigned traits related to warmth and poor competence. Taken together, these studies confirmed that perceptions of low competence and 'baby brain' in pregnancy is broadly held by a non-pregnant sample.

KEYWORDS
competence, pregnancy, Stereotype Content Model, stereotypes, warmth

INTRODUCTION

'Baby brain' is the perception that pregnant women, and women in the postpartum period, have reduced cognitive abilities (Davies et al., 2018). As Longhurst (1997) proposes, there is a stereotype that women are cognitively inferior during their pregnancy and into the immediate postpartum period, a concept referred colloquially as 'mommy brain', 'preg head' or, more commonly, 'baby brain' (Brett & Baxendale, 2001). This effect has been subject to decades worth of research, the majority of which takes a cognitive or neurological perspective (e.g., Brett & Baxendale, 2001). To date, much of this research has attempted to delineate whether 'baby brain' constitutes a 'real' effect, that is whether there is a quantitative difference between the performance of pregnant women compared with other groups.

However, regardless of the physiological evidence for 'baby brain' (Crawley et al., 2008; Pownall et al., 2021), the notion that pregnant women are *perceived* to have reduced cognition is problematic because it can result in prescriptive expectations (i.e. stereotypes) about women's competence and, thus, warrants empirical investigation. This is particularly concerning given the evidence which shows the other stereotypes and stigma that pregnant women face. For example, research has demonstrated how pregnant women are generally perceived to be less intelligent (Morgan et al., 2013), less committed employees (Correll et al., 2007; Jones, 2017) and overly hormonal (Longhurst, 2008). This perception is aligned with the notion that pregnant women are incompetent (Hurt, 2011), are at the continual mercy of their hormones (Longhurst, 1999) and thus face discrimination, prejudice and benevolent sexism throughout pregnancy (e.g., Halpert et al., 1993; Johnson, 2008; Kitroeff & Silver-Greenberg, 2019; Masser et al., 2007; Sutton et al., 2011).

Research has demonstrated the sexism and prejudice that women face during pregnancy. For example, Masser et al. (2007) showed how pregnant women were discriminated against in a job hiring context and Correll et al. (2007) used a laboratory experiment to demonstrate that pregnant mothers were recommended lower starting salaries compared with fathers. However, despite this research, there has been no research which directly considers whether the perception of pregnant women as cognitively inferior is widely held by a *general* population. In addressing widely held perceptions of cognitive ability of pregnant women, this directly addresses the question of whether 'baby brain' is a perception endorsed by the public. Furthermore, the question of whether perceptions of cognitive inferiority are unique to pregnancy, or whether the 'baby brain' perception constitutes a more generic form of gender stereotyping that also applies to other parental groups, such as fathers or mothers with young children, has not yet been empirically tested. Therefore, to provide clarity, in the present work, we investigated the *contents* of social stereotypes about pregnant women, in comparison with other groups.

We theorized that pregnancy may be a time of heightened gender stereotyping, given how research demonstrates that gender inequalities become increasingly pronounced throughout the transition to parenthood (Endendijk et al., 2018; Morgenroth et al., 2021). For example, parenthood accounts for higher discrepancies in men and women's earnings across countries (Cooke, 2014), unequally gendered division of labour (Brines, 1994; Craig, 2007; Greenstein, 2000), and this creates differences in men and women's attainment (e.g., Budig & England, 2001; Burgess, 2013). Due to this, researchers have suggested that parenthood is a 'critical site' of gendered inequalities (Lyness & Judiesch, 2014), which is reinforced by traditional gendered norms and stereotypes (e.g., Coltrane, 2000). Therefore, the gender norms that parents face may represent an *amplified* version of existing gender norms, expectations and stereotypes (Fox, 2001; Masser et al., 2007). With this logic, pregnancy should also constitute a time of heightened gender stereotyping; however, this has not yet been empirically investigated.

Stereotype content model (SCM)

To understand the social stereotypes related to pregnant women, we adopted the Stereotype Content Model (SCM; Fiske et al., 2002) as a theoretical model. This model posits that traits of 'warmth' (i.e. kindness, compassion and pro-sociality) and 'competence' (i.e. intelligence, skills and agency) exist in a *fourfold taxonomy*, whereby subgroups of people are socially categorized as either high or low in each,

irrespective of each other (see Fraser et al., 2021). Competence is generally associated with higher status groups (Dovidio et al., 2000) and warmth with lower status groups. The dimension of warmth has been labelled in other work as 'communion' (Abele & Wojciszke, 2014), 'social goodness' (Rosenberg et al., 1968) or social skills (e.g., Lai & Babcock, 2013); likewise, competence has been referred to as 'agency' (Abele & Wojciszke, 2007) or intelligence (Rosenberg et al., 1968). The SCM is a useful framework to use to study parenthood, given how mothers and fathers are broadly categorized as fulfilling either the duty of 'breadwinner' or 'caregiver', (Riggs, 1997) and given the gender penalties in parenthood (Morgenroth et al., 2021). As Riggs (1997) highlights, the social roles of 'breadwinner' or 'caregiver' are directly influenced by perceptions of a person's traits of communality and agency. Furthermore, Park and Banchefsky (2018) have also highlighted how parenthood impacts perceptions of communality and competence, such that traits considered typical of men are not considered typical of fathers, an effect that did not occur for women and motherhood (see also Hodges & Park, 2013).

Importantly, the SCM illustrates that perceptions of warmth and competence are not mutually exclusive (Fiske et al., 2002). Thus, there are four broad reactions to these of this stereotype content, depending on whether an individual is rated as high or low on either dimension, these are defined by Fiske and colleagues as: *admiration* (pertaining to those rated high in warmth and high in competence; Fiske, 2012), *contempt* (low on both dimensions), *envy* (high competence and low warmth) and *paternalism* (low competence and high warmth). Women of mixed valence, that is those who are high in one dimension and low in another, are often met with ambivalence (Cuddy et al., 2004) or, in the context of gender stereotypes, ambivalent sexism (e.g., whereby women are either treated hostilely or benevolently; Glick & Fiske, 2001; Glick et al., 2000). Therefore, the content of the stereotypes informs the nature of the social perception (Cuddy et al., 2007, 2008).

Gender stereotypes

A body of research has suggested that women are perceived generally to be communal and warm, and men are stereotyped to be more competent, agentic and assertive (Eagly et al., 2000; Eagly & Steffen, 1984; Eagly & Wood, 1985; Spence et al., 1975). This distinction has demonstrated robustness over time (e.g., Cuddy et al., 2009). These stereotypes inform distribution of genders in different domains and, therefore, govern expectations and behaviour (Moss-Racusin et al., 2012). Importantly, these stereotypes about different groups are not only descriptive and categorical, but they are *also prescriptive*, in that they dictate what groups *should* look like and do (Cialdini & Trost, 1998; Eagly & Steffen, 1984; Ramos et al., 2018). For example, the overriding stereotype of women as warm but incapable thus determines that women should behave in a way that is passive and subservient (Williams & Best, 1990) and in need of help (Kahalon et al., 2018). These stereotypes have harmful consequences for women, including restricting access to traditionally masculine fields (e.g., STEM careers; Good et al., 2012), reducing women's leadership aspirations (Johnson et al., 2008) and harming performance evaluations (Bauer & Baltes, 2002). The amplification of gender stereotypes in parenthood is likely due to the notion that motherhood, as a social category, embodies stereotypically feminine traits (Cuddy et al., 2004; Heilman & Okimoto, 2008), and thus, motherhood is socially constructed as a 'critical aspect of femininity' (Choi et al., 2005, p. 168). Some early work has explored how perceptions of pregnant women fit within the SCM. For example, Masser et al. (2007) investigated perceptions of pregnant versus non-pregnant employees and found that pregnant women were perceived as more competent and warmer but were offered a low starting salary and were less likely to be hired. This suggests that the contents of stereotyping may impact discrimination in the context of pregnancy; however, given the surprising results of Masser et al.'s (2007) study (particularly in terms of competence), there is clearly a need to continue to evaluate perceptions beyond workplace scenarios (see also Morgan et al., 2013).

Gender stereotyping has been explored in some depth in the context of parenthood, overwhelmingly in the context of perceptions of mothers and fathers in the workplace (e.g., Etaugh & Folger, 1998; Morgenroth et al., 2021; Park & Banchefsky, 2018). For example, Fuegen et al. (2004) found that parents were judged by to be less agentic than non-parents; moreover, mothers were appraised more harshly

compared with fathers. This echoes Burgess' (2013) notion of a 'motherhood penalty', in that social expectations of mothers are perceived to be at odds of that of 'ideal worker', which leads to harsher judgements and perceptions of lower organizational competence and commitment. Research also demonstrates that mothers are perceived to be less competent in the context of employment decisions (Correll et al., 2007; Heilman & Okimoto, 2008), which reflects wider gender stereotypes and is related to the fundamental negative perceptions of 'caregiver' as a devalued role (Ridgeway & Correll, 2004).

Overall, there is evidence in the literature to suggest that parenthood may be a site of amplified gender stereotypes. To date, empirical work has concentrated on perceptions of the broad categories of mothers and fathers (Morgenroth et al., 2021; Park & Banchefsky, 2018). However, given the 'baby brain' perception noted throughout the literature (Halpert et al., 1993), there is a need to apply this paradigm to pregnancy specifically. In investigating the social contents of stereotypes related to pregnant women, this can help in understanding the aetiology of gendered discrimination and stigma that pregnant women face (Fox & Quinn, 2015; Hackney et al., 2021). The two empirical studies reported here each explore the social contents of pregnancy stereotypes, using the SCM.

STUDY 1

Study 1 investigated how pregnant women are stereotyped, relative to other groups, using the SCM as a theoretical framework. While recent work has demonstrated that the two dimensions of warmth and competence continue to shape contemporary stereotypes (Fiske, 2018), this concept has not yet been applied to perceptions of pregnant women. A notable exception is Masser et al. (2007) who used the SCM to study perceptions of pregnant employees. This study found that pregnant job candidates were perceived to be warmer and more competent than non-pregnant candidates and were discriminated against in other ways. It is important that pregnancy stereotypes continue to be investigated, given the discrimination, prejudice and sexism that pregnant women face (Sutton et al., 2011). Study 1 thus used an online survey to test explicit stereotypes about social groups, including pregnant women. Study 1 was interested in understanding blatant or explicit stereotypes, to provide a useful starting point in the consideration of pregnancy stereotyping. In Study 1, we hypothesized that, in line with the SCM, pregnant women would generally be perceived as less competent and more warm than other groups.

Method

Participants and design

After removing 39 incomplete entries, the total sample comprised 590 participants (M_{age} = 24.16, SD = 9.57), recruited through survey share platforms (e.g., SurveyShare), social media websites and the University of Leeds undergraduate participant pool from November 2018 to January 2019. Most participants were female (82.4%), White British (73.5%), non-parents (87.9%), educated to A-level standard or above (94.2%). We did not have an a priori sample size, and instead aimed to collect as many participants as we could during the three-month data collection window. This three-month data collection period was necessary, given resource and time constraints (i.e. this work formed part of the lead author's PhD research). Ethics approval was granted by the University of Leeds School of Psychology Research Ethics Committee. (Ref: PSC-457) on 16th November 2018. This study followed a within-subject design; that is, all participants received all study materials. The study was conducted online.

Procedure

Participants were asked to rate a target group (Pregnant Women) and thirteen other comparison groups (New Father, New Mother, Elderly Man, Elderly Woman, Teenage Boy, Teenage Girl, Working Mother,

Working Father, Mother with a Young Child, Father with a Young Child, Middle-aged Woman, Middle-aged Man, Pregnant Teenager) on their perceived 'warmth' or 'competence'. These groups were chosen to represent other parental groups with a gendered dimension (i.e. ostensibly male and female versions of each, with ties to parenthood). Participants were asked 'how would you rate the ability of a [*Target*] to…' complete seven ability domains, three of which were related generally to 'competence' ('*remember information/solve a logic problem/complete a mathematics equation*') and three to 'warmth' (*comfort and support other people/empathize with others/respond compassionately to a person in distress*) with one filler item (*lift heavy objects*). This was scored on a five-point Likert scale ranging from 1 (*extremely below average*) to 5 (*extremely above average*). This is adapted from Fiske et al.'s (2002) original methodology. Both the order of groups and the order of the listed domains were fully randomized, using the survey flow randomisation function in Qualtrics. The option 'evenly present elements' was selected to ensure randomisation. Participants were prompted to 'be as honest as possible and be reminded that there are no right or wrong answers'.

Mean ratings of competence and warmth were then calculated for each of the fourteen groups by averaging the ratings for the competence domains (maths, logic, memory) and the warmth domains (compassion, empathy and comfort). Cronbach alpha confirmed that each scale had strong internal consistency (Competence $\alpha = 0.92$, Warmth $\alpha = 0.93$). Previous research has utilized a cluster analysis approach, in which groups are clustered together based on their ratings within the stereotype taxonomy (Durante et al., 2010; Everitt et al., 2011; Fiske et al., 2002). In this study, because the structure of the SCM has been previously demonstrated to be robust and stable (Fiske, 2018), mean comparisons were used (as per Cuddy et al., 2004) to directly test the hypotheses about the stereotype content of pregnant women compared with the other parental groups.

Participants were then provided with a brief definition of the term 'cognitive abilities' ('*Cognitive abilities' refers to how well someone performs on brain-based tasks, which may include problem-solving, memory, attention, concentration, and language*') and were asked to indicate the extent to which they thought there was a difference between the cognitive abilities of women compared with men (*1 = there is no difference, 2 = there is a moderate difference, 3 = there is a big difference*). Participants were asked 'How would you describe this difference?' and were provided with a 5-point Likert scale (1 = *women have much weaker cognitive abilities* to 5 = *women have much stronger cognitive abilities*). Participants then completed a final measure which rated their understanding of the pregnancy-related changes and experience of pregnancy.

Analysis plan

To initially test for differences in ratings across the groups, a multivariate analysis of variance (MANOVA) was conducted, with one within-subjects factor (Group) with fourteen levels and one between-subjects factor (participant Gender) with two levels (male vs female), and warmth and competence scores as the dependent variables. When multivariate effects were significant, univariate effects were then investigated and post-hoc tests were performed with Bonferroni corrections, to investigate how pregnant women differed from the other groups. Then, as per Williamson (2019), using the Group means for warmth and competence as midpoint anchors, each group was plotted within the SCM taxonomy (see Figure 1). Differences in warmth and competence ratings between groups assigned to the four quadrants of the SCM taxonomy were then investigated.

Results

Warmth and competence ratings

To initially explore whether the groups differed in warmth and competence ratings, a within-subjects MANOVA with fourteen levels (group: pregnant woman, teenage boy, teenage girl, teenage pregnant girl, middle-aged man, middle-aged woman, new father, new mother, working father, working mother,

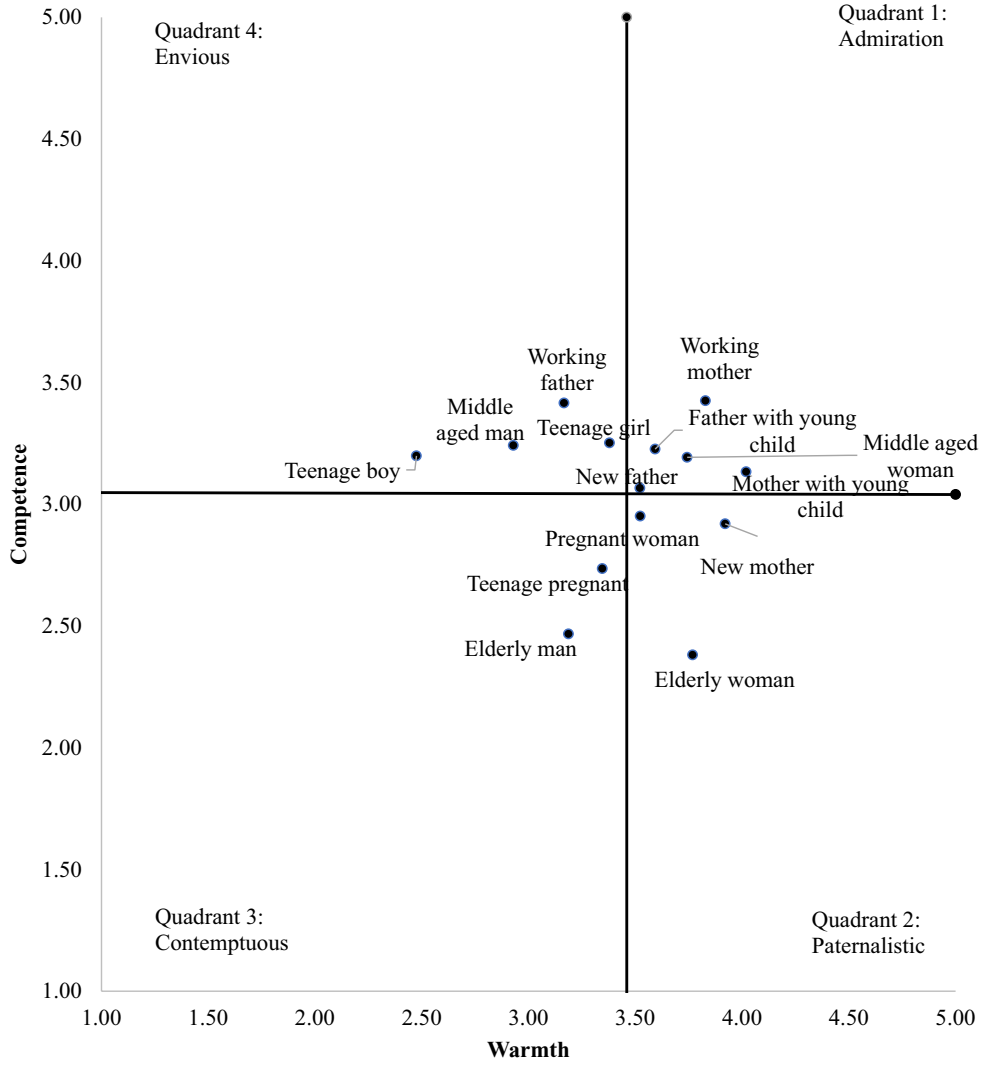

FIGURE 1 Groups warmth and competence ratings fit within the SCM taxonomy. Warmth and competence dividing lines are plotted on the median point.

mother with young child, father with young child, elderly man and elderly woman) was run, with two dependent variables: ratings of warmth and ratings of competence and one between-subjects factor, participant gender. The MANOVA showed an overall multivariate within-subjects effect of Group, $F(26, 446) = 34.670$, Wilks $\Lambda = 0.331$, $p < .001$, $n_p^2 = 0.669$. Further, there was also a small but significant between-subjects multivariate effect of Participant Gender, $F(2,470) = 3.321$, Wilks $\Lambda = 0.986$, $p = .037$, $n_p^2 = 0.014$. However, there was no significant Participant Gender*Group multivariate interaction, so this was not analysed further, $F(26, 446) = 1.469$, Wilks $\Lambda = 0.921$, $p = .066$, $n_p^2 = 0.079$.

The univariate tests for warmth and competence were then investigated. For ratings of warmth, there was a significant effect of Group, $F(9.207, 1830.71) = 136.19$, $p < .001$, $n_p^2 = 0.224$. Since normality checks indicated that sphericity was violated (Mauchley's $\varepsilon = 0.118$), Greenhouse–Geisser corrected results are reported here. There was also a significant effect of Group on competence ratings, $F(8.523, 4014.123) = 115.19$, $p < .001$, $n_p^2 = 0.196$. Next, to test the hypothesis that pregnant women specifically would be rated as more warm and less competent than other groups, post-hoc pairwise compari-

sons with Bonferroni corrections were investigated. Post-hoc pairwise comparisons indicated that pregnant women were rated as significantly warmer than almost all non-parent groups ($p < .001$ in all cases) except middle-aged women, new mothers, mothers with young children, working mothers and elderly women, who were each rated as significantly more warm than pregnant women (see Table 1 for comparisons between groups). There was no significant difference between pregnant women compared with new fathers and fathers with a young child on warmth ratings. For competence ratings, pregnant women were rated as significantly less competent than most groups except teenage pregnant girls and elderly people, who were each rated as significantly less competent than pregnant women. There were also no differences between the competence ratings of pregnant women and new mothers (Table 1).

Stereotype content model taxonomy

Using the group means, each parental group was then classified along Fiske et al.'s (2002) quadrants of Stereotype Content, to ascertain how each group descriptively fit within this taxonomy of stereotyping. This was achieved by mapping the groups onto the SCM taxonomy, as per Williamson (2019). Middle-aged men, teenage boys and working fathers were rated as fulfilling the 'envious' response; that is, high competence, low warmth. Teenage girls were also perceived to fit within the 'envious' quadrant. Importantly, working mothers, fathers and mothers with young child and middle-aged women were perceived the most positively, in the 'high warmth, high competence' quadrant of the SCM, and thus eliciting the 'admiration' response. Only new mothers, pregnant women and elderly women elicited the 'paternalistic' quadrant of the SCM, as they were perceived to be generally high in warmth but low in competence, although, in some cases (e.g., pregnant women), this grouping was less marked than others (i.e. groups were on the borderline of the taxonomy). Finally, elderly men and teenage pregnant women were perceived to fulfil the 'contemptuous' quadrant, and they were perceived to be low in both warmth and competence.

After coding each group for their respective taxonomy, a one-way ANOVA was then run, with ratings of mean warmth and competence as the dependent variables and assigned quadrant as the independent variable, with four levels representing the four taxonomies. Overall, the ANOVA showed significant

TABLE 1 Descriptive statistics with differences compared with pregnant women marked in superscript.

	Warmth		Competence	
	M	*SD*	*M*	*SD*
Pregnant woman	3.52	0.50	2.95	0.51
Teenage boy	2.48*a	0.60	3.12*b	0.56
Teenage girl	3.38*a	0.69	3.25*b	0.56
Pregnant teenager	3.35*a	0.70	2.74*a	0.62
Middle-aged man	2.93*a	0.61	3.24*b	0.52
Middle-aged woman	3.74*b	0.59	3.19*b	0.50
New father	3.52	0.64	3.07*b	0.56
New mother	3.92*b	0.70	2.92	0.60
Working mother	3.83*b	0.65	3.43*b	0.54
Working father	3.17*a	0.64	3.42*b	0.55
Mother with young child	4.02*b	0.66	3.13*b	0.53
Father with young child	3.59	0.61	3.23*b	0.51
Elderly man	3.19*a	0.72	2.47*a	0.70
Elderly woman	3.77*b	0.66	2.38*a	0.65

Note: *a indicates significantly lower than pregnant women, $p < .001$, using Bonferroni corrections.

*b indicates significantly higher than pregnant women, $p < .001$, using Bonferroni corrections.

between-group differences for both overall mean warmth, $F(3,13) = 7.511$, $p = .004$, $\eta p^2 = 0.03$ and competence $F(3,13) = 9.643$, $p = .001$, $\eta p^2 = 0.048$. Post-hoc tests with Bonferroni corrections were used to investigate how each quadrant of our plotted SCM differed from one another in perceived warmth and competence. Those coded as belonging to the 'admiration' quadrant were perceived to be significantly warmer than the 'envious' quadrant $p = .011$ [95% CIs, 0.17, 1.33], but not the contemptuous ($p = .49$) or paternalistic quadrants ($p = 1.00$). The paternalistic quadrant was perceived to be significantly warmer than the envious quadrant $p = .025$ [95% CIs, 0.08, 1.41]. There were no other significant differences between the contemptuous group and any of the other quadrants (all $p > .05$). The admiration quadrant was also perceived to be significantly more competent than the paternalistic quadrant $p = .042$, [95% CIs, 0.015, 0.905] and the contemptuous group $p = .018$ [95% CIs, 0.095, 1.115], but not the contemptuous group ($p = 1.00$).

Perception of cognitive abilities

Finally, the frequencies of agreement with '*there is a difference between the cognitive abilities of [men and women]* and [pregnant women and non-pregnant women]' were investigated. A total of 65% of participants reported that there was 'no difference' between the cognitive abilities of men and women. A total of 54.1% of people thought there was a 'moderate' different between the cognitive abilities of pregnant women versus non-pregnant women, in the direction that 'pregnant women have moderately weaker cognitive abilities' (48.7%).

Discussion

Study 1 broadly aimed to investigate how distinct parental groups fit into Fiske et al.'s proposed SCM, which suggests that people are generally appraised along a continuum of warmth and competence (see Fraser et al., 2021). This focused on whether pregnant women differ to other groups. Overall, this study confirmed that, relative to the other groups, pregnant women were broadly stereotyped to have lower competence, which corroborates the 'baby brain' stereotype. This suggests that 'baby brain' is a broadly held perception of pregnant women. Study 1 also found evidence to support the notion of protective paternalism against pregnant women and new mothers, which echoes the notion of benevolent sexism in early motherhood and beyond (e.g., Glick & Fiske, 2001). That is, pregnant women and new mothers occupied the low competence, high warmth quadrant, eliciting the stereotype of paternalism (although, for pregnant women, this group membership was borderline). The notion that these groups of women are stereotyped to be largely warm and incompetent, thus triggering a 'paternalistic' response (Eckes, 2002; Haddock & Zanna, 1994) is aligned with the 'women are wonderful' effect (Eagly & Mladinic, 1989). This explains the protective paternalism that women experience, particularly in times where these distinctions are most prominent; for example, during pregnancy (e.g., Sutton et al., 2011) and motherhood (e.g., Szastok et al., 2019).

STUDY 2

Study 1 investigated the social perceptions of pregnant women's warmth and competence, using items aligned with the SCM. However, there may be other stereotypes related to pregnancy that are not captured by this framework. Therefore, in order to identify wider contents of stereotypes associated with pregnancy, Study 2 used a trait generation task (Katz & Braly, 1933), to extend inquiries into the contents of stereotypes related pregnant women, relative to other groups. Trait generation tasks have been used in previous literature to investigate constructs such as perspective taking and cognitive representation of people (Davis et al., 1996) and stereotyping (Hummert et al., 1994). This extends previous research

which has used ratings of set traits and attributes to investigate stereotypes about parents (Morgenroth et al., 2021). Study 2 was an exploratory study that broadly aimed to ascertain the stereotyping of pregnant women in more depth than Study 1.

Method

Participants and design

Fifty-four participants were recruited through the University of Leeds participant pool. Participants (M_{age} = 19.17, SD = 1.34) were mainly White British (92.5%) and heterosexual (81.1%). No participants were removed for incomplete data. Participant gender was not collected, due to an error with the Qualtrics survey. While, as with Study 1, we had no a priori sample size calculation, we aimed to collect as many responses as we could during the data collection window. This sample size is generally in line with other studies that use trait allocation tasks (e.g., Geiger et al., 2006, N = 61; Schmidt & Boland, 1986, N = 86). Ethics approval was granted by the University of Leeds, School of Psychology Research Ethics Committee (Ref: PSC-772) on 21st October 2019. This study followed a within-subjects design; participants were not assigned groups or randomized to conditions.

Procedure

Participants completed one testing session that lasted for approximately 5–10 minutes. The study was hosted online on Qualtrics, which participants accessed from the local participation pool. After providing informed consent and some demographic information (including age, gender and ethnicity), participants were then given a free text box and were assigned a target group (Pregnant Women, New Mother, Men or Women). Participants were then asked *Please list as many specific traits and behaviours as possible that you think are associated with* [*Pregnant Women/New Mothers/Men/Women*]. Participants provided traits for all groups. Presentation of groups were randomized, so participants provided traits for each group in random orders.

Results

Analysis procedure

Across the targets, after removing direct duplicates within participants (n = 194), participants generated an initial list of 988 unique words and phrases in total. Data for this study can be accessed here: https://osf.io/r26by/. These were downloaded from Qualtrics into a CSV file for analysis. The full dataset was then analysed descriptively using a deductive approach to content analysis, using the SCM as the guiding framework (as per Vaismoradi et al., 2013). As per Study 1, the domains of warmth and competence were used as the two core deductive codes, and the textual data were coded as pertaining to either 'warmth', 'competence' or 'neutral' (i.e. neither). Competence was split into 'positive competence' (e.g., 'smart', 'intelligent') and 'negative competence' (e.g., 'weak', 'stupid'). Warmth was kept as one factor, because there were no traits or words that fulfilled the criteria of 'low warmth' (i.e. all were positive; 'compassionate', 'kind'). Coding was done entirely by the lead author (MP) and discussed at intervals with the second and third author. We did not employ second coding and thus cannot comment on interrater reliability. This was decided predominantly because (1) the codes were intuitive and descriptive (i.e. the phrase 'smart' was clearly coded as 'competence') and (2) the coding was discussed in supervision during the whole process. Furthermore, this type of analysis was considered appropriate given that this study was thus a deductive, rather than an inductive, qualitative study, which is an approach suitable for data which require a 'low level of interpretation' (Vaismoradi et al., 2013, p. 399). This approach is inspired by previ-

ous literature, including trait generation studies exploring stereotypes about stereotyped groups such as lesbians (Geiger et al., 2006) and older people (Hummert et al., 1994).

Warmth and competence frequencies

The frequency of each group's ratings was then investigated, to explore the general stereotyping within each of the domains (i.e. negative competence, positive competence, warmth and neutral). Multinomial tests of observed proportions were conducted for each of the codes. Out of the 233 codes assigned across the dataset which represented 'positive competence' (e.g., 'smart', 'strong', 'confident', 'powerful', 'assertive'), men represented the significant majority of these codes (49.36%), X^2 (3, N = 233) = 125.403, $p < .001$. Of the 236 codes pertaining to 'negative competence' (e.g., 'fragile', 'overwhelmed', 'exhausted', 'disorganized'), pregnant women were significantly most frequently represented (46.19%), X^2 (3, N = 236) 121.593, $p < .001$. Of the 378 codes referring to 'warmth' (e.g., 'kind', 'caring', 'nurturing', 'considerate', 'loyal'), both women (36.77%) and new mothers (35.98%) represented the significant majority of codes. Finally, both men (34.75%) and pregnant women (40.43%) were also assigned the majority of the 141 traits coded as neutral. Table 2 shows counts for each code by assigned group, to allow for comparisons across groups. This provides further support for the findings of Study 1, in that pregnant women were too associated with traits that were coded as 'negative competence'.

Discussion

Overall, Study 2 aimed to investigate the specific contents of pregnancy-specific stereotypes, using a trait generation task. This aimed to extend the work reported in Study 1, by investigating the more nuanced contents of pregnancy stereotypes, relative to other groups. Study 2 generally corroborated the findings of Study 1, as pregnant women were again viewed to have low competence. Interestingly, results demonstrated that pregnant women were ascribed traits of 'negative competence' but not 'warmth'. The group of women was associated with 'warmth' traits the most. This suggests that while women generally are associated with high warmth, in pregnancy, stereotypes are categorized by perceptions of diminished competence. This provides support for the existence of a 'baby brain' stereotype, as this perception is driven by low competence, rather than high warmth in pregnancy.

GENERAL DISCUSSION

Overall, the two studies reported here broadly aimed to establish the contents of pregnancy stereotypes. This work assessed the contents of stereotypes about pregnant women, using Fiske et al.'s (2002) SCM as a theoretical framework. Across a large-scale empirical study (Study 1) and a trait generation task (Study 2), this work confirmed that pregnant women are stereotyped to have lower competence than other

TABLE 2 Frequency of negative competence, positive competence, warmth and neutral codes assigned to each group (new mothers, women, men and pregnant women). Percentages in parentheses show proportion of codes in each group represented by each category (positive/negative competence, warmth or neutral).

	Positive competence	Negative competence	Warmth	Neutral	Total
Pregnant women	14 (5.74%)	109 (44.67%)	64 (26.23%)	57 (23.36%)	244
New mothers	20 (7.58%)	91 (34.47%)	136 (51.52%)	17 (6.44%)	264
Men	115 (55%)	6 (2.87%)	39 (18.66%)	49 (23.44%)	209
Women	84 (31%)	30 (11.07%)	139 (51.29%)	18 (6.64%)	271
Total	233 (23.59%)	236 (23.89%)	378 (38.36%)	141 (14.27%)	988

groups. In Study 1, pregnant women fell within the 'paternalistic' quadrant of the SCM taxonomy, which also corroborates the previous literature that shows how pregnant women are subject to protective paternalism, which is linked to benevolent sexism in pregnancy (Murphy et al., 2011; Sutton et al., 2011). Taken together, this work suggests that perceptions of 'baby brain', or reduced competence in pregnancy, is a feature of social stereotyping towards pregnant women. This differs from stereotypes related to women generally, as this stereotype is typically fuelled by perceptions of high warmth, rather than low competence. Generally, therefore, this demonstrates the utility of assessing gender stereotypes towards specific groups of women in depth, in order to capture the nuances of stereotypes towards different groups of women.

This work has important theoretical and practical implications. For example, across the two studies reported here, pregnant women were stereotyped to have low competence. This suggests that, while there has been discussion surrounding the cognitive, neurological facets of 'baby brain' (Davies et al., 2018), stereotyping plays a vital role during this stage of women's lives. This evidences the value in applying a social psychological perspective to provide further insights into 'baby brain' (as per Crawley et al., 2008; Hurt, 2011; Pownall, 2019). It also corroborates previous literature which demonstrates the stigma and sexism that pregnant women face. For example, social psychologists have provided useful evidence which demonstrates how pregnant women are framed to be incompetent and lacking cognitive abilities. This work has typically focused on the empirical evidence which shows the pervasive levels of maternity prejudice (Longhurst, 1999; Masser et al., 2007), benevolent sexism (Hebl et al., 2007; Sutton et al., 2011) and discrimination (Halpert et al., 1993; Johnson, 2008; Kitroeff & Silver-Greenberg, 2019) that women face as a result of their pregnancy. This, as the present work attests to, is fuelled by the existence and promotion of negative stereotypes about pregnant women, which suggest pregnant women are warm but incapable (Fiske et al., 2002; Glick & Fiske, 1997). These perceptions have important consequences; for example, research shows that pregnancy discrimination leads to negative treatment in the workplace (Bragger et al., 2002; Fox & Quinn, 2015; Little et al., 2015, 2018) and increased postpartum depression symptoms (Hackney et al., 2021).

There are some limitations to the work here must be acknowledged. Most notably is the cultural homogeneity of both samples reported here. Participants for both studies were predominately young, White, educated samples that may not represent more nuanced stereotypical views. Both samples were chosen primarily for convenience sampling, but this decision limits the generalisability of the findings. Indeed, some research has identified certain cultural differences that exist in the stereotyping of similar groups. For example, Chrisler et al. (2014) provide evidence for cross-cultural differences in perceptions of women at different stages of reproductive life (Mexico vs the United States) and found cultural differences in benevolent and ambivalent sexism. Furthermore, this work did not explore how other demographic characteristics of pregnant women may impact perceptions towards them. This may be an important factor; for example, there is a small but growing body of literature which explicitly considers how Black American women experience unique stereotypes related to motherhood and sexuality (see Rosenthal & Lobel, 2016). This is an important avenue for future research in the area of stereotyping.

Furthermore, although there is strong evidence which points to the existence of a broadly gendered framework of competence and warmth, gender scholars have also noted that different parental subgroups within the broad gendered categories may be stereotyped differently (e.g., Cuddy et al., 2004). There may also be wider categories of 'mother' and 'pregnant woman' that are not captured in the present two studies. For example, Odenweller et al. (2020) studied the stereotyping of stay-at-home mothers and working mothers and noted that both positive and negative stereotypes about these groups emerged, such that working mothers are perceived to be less dedicated to childcare than stay-at-home mothers (Etaugh & Folger, 1998). For example, Ganong and Coleman (1995) provide evidence to suggest that different 'types' of mothers are stereotyping differently in different contexts. In recent years, this model has been explored in relation to warmth-competence dimensions concerning professional mothers (Cuddy et al., 2004), pregnant employees (Masser et al., 2007) and mothers of different socioeconomic status (Dodson & Schmalzbauer, 2005). Further work has extended these enquiries; for example, Cuddy et al. (2004) note that working mothers have 'dual category membership' in relation to the SCM. Working

mothers may fulfil the stereotype of '*female professional*' (stereotypically competent, yet cold) or '*homemaker*' (stereotypically incompetent, yet warm). Similarly, there may be value in assessing the more implicit, subtle stereotypes that women face, and investigating whether such stereotypes are different for pregnant women vs other groups of women. The present work addressed explicit, blatant stereotyping, but there remains a need to address implicit, subtle stereotyping, to provide a more nuanced picture of the stereotypes that pregnant women face. Indeed, turning attention to implicit stereotypes may (1) reduce social desirability biases in participants' responses and (2) provide more insight into the paradoxes reported in previous stereotyping work (e.g., Masser et al., 2007).

Therefore, the present studies have focused on investigating the broad contents of social stereotypes related to pregnant women as an overall social group. This approach has followed other studies which use broad group categories to examine overall stereotypes related to 'ideal' members of social groups (e.g., Morgenroth et al., 2021). However, future work should now aim to extend this research, by exploring how different groups of pregnant women may be stereotyped differently, and indeed whether pregnancy stereotypes are distinct from broader gender stereotypes about women. This work could also explore how different groups of people stereotype pregnant women differently; for example, investigating whether parents view pregnant women as more or less competent than non-parents. Indeed, in further delineating how other social identities intersect with pregnancy to produce more nuanced social stereotypes, this will paint a more complete picture of how women are stereotyped throughout their transition to motherhood.

CONCLUSION

Overall, across two studies, we have investigated the contents of social stereotypes about pregnant women, using the Stereotype Content Model (Fiske et al., 2002) as a theoretical framework. Both studies demonstrated how low competence and high warmth are components of the social stereotypes relating to pregnant women, which means that pregnant women elicit *paternalistic* responses, characterized by restriction of freedoms, pity and protective, benevolent sexism (Eckes, 2002). This further corroborates the notion that pregnant women are subject to benevolent sexism (Murphy et al., 2011; Sutton et al., 2011), negative stereotyping (Masser et al., 2007) and discrimination (Halpert et al., 1993), which, we theorize, may be fuelled by these perceptions of low competence and high warmth.

Our investigation into the specific contents of pregnancy social stereotypes has important consequences for understanding the discrimination and stigma that women face throughout their pregnancy. Indeed, research has demonstrated the pervasive negative impacts of pregnancy discrimination; for example, perceived pregnancy discrimination has been found to negatively impact mother and baby health (Hackney et al., 2021) and pregnancy stigma can contribute to women leaving the workforce (Fox & Quinn, 2015). Therefore, it is crucial that the contents of stereotypes are routinely examined, in order to determine where this discrimination comes from, that is what perceptions may be fuelling these downstream consequences. In this paper, our empirical research found that pregnant women are indeed stereotyped to have poorer competence and higher warmth, which may indicate that the existence of such social stereotypes may, in turn, contribute to discrimination and stigma.

AUTHOR CONTRIBUTIONS

Madeleine Pownall: Conceptualization; data curation; formal analysis; investigation; methodology; project administration; writing – original draft; writing – review and editing. **Mark Conner:** Supervision; writing – review and editing. **Russell R. C. Hutter:** Supervision; writing – review and editing.

CONFLICT OF INTEREST

All authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

Data for Study 1 is available upon request. Data for Study 2 can be accessed here: https://osf.io.r26by/.

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