Understanding of intersex: The meanings of umbrella terms and opinions about medical and social responses among laypeople in the United States and United Kingdom.

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Abstract Intersex variations render a person’s body as different from both normative male and female embodiment. Medical intervention on infants’ intersex traits is long-standing, common, and contested for breaching human rights to bodily integrity and self-determination. Such intervention is justified by the threat of unbearable social stigma, but empirical studies of stigma and public understanding are lacking. Here, UK and USA participants (N=271) reported their free associations to three contested ‘umbrella terms’ for intersex, and their opinions about diverse medical and social responses. Among the umbrella terms, hermaphrodite prompted most references to non-humans, intersex prompted most references to social identities, and disorders of sex development prompted most references to children. Participants’ opinions about medical and social responses to intersex traits were more consistently predicted by sexual identity than any other demographic variable; LGB+ participants endorsed social responses more, whilst heterosexual participants endorsed medical responses more. Beliefs in non-binary gender and lower right-wing authoritarianism predicted support for social responses and opposition to medical responses, and accounted for some sexual identity differences. Social and clinical implications are discussed.

Short Abstract Medical interventions targeting infants’ intersex traits is a controversial way to reduce the impact of stigma on such children, but public understanding of intersex is rarely studied. 271 USA and UK lay people’s understandings of controversial ‘umbrella terms’ in this area and opinions about medical and social interventions are described. Heterosexual people endorsed medical interventions more and social interventions less than LGB+ people, in part because heterosexual people were more authoritarian and endorsed gender binary beliefs more.

Keywords: intersex, LGB+ people, medicalization, public opinion, terminology.
Public Understanding of Intersex Controversies and the Umbrella Terms that Frame Them in the USA and UK

*Intersex* refers to physical traits that, and to people whose bodies vary from normative or typical definitions of both male and female embodiment. The United Nations estimates that 0.05% to 1.7% of infants are born with some intersex trait (Munro, Crocetti, Yeadon-Lee, Garland, & Travis, 2017). However incidence estimates vary, both because different aspects of physical sex (such as genetic and anatomical variation) are given different weight by medical experts in grounding the category, and because the historical legitimacy of medical interventions, which call for such diagnoses are a matter of some debate (Griffiths, 2018). Medical protocols, developed in the middle of the 20th century, prescribed early normalizing surgery on the assumption that no child who was aware of their intersex traits could achieve psychological adjustment, and that no parent could bond with such a child (see Morland, 2015; Reis, 2009). Medical interventions continue to have the overall aim of societal adjustment (Lee, Houk, Ahmed, & Hughes, 2006). When presented as viable medical choices, medical interventions on infants are very commonly chosen, by 96.2% of parents in a recent multi-centre study in the USA (Ellens, Bakula, Mullins, Reyes, Austin, & Baskin, 2017), and at equal rates over time according to a review of the United Kingdom’s National Health Service provision (Michala, Lizo, Wood, Conway, & Creighton, 2014). However, psychosocial research suggests that such benefits are not always achieved by medical interventions in healthcare practice (Roen, 2019).

Indeed, international bodies increasingly assert that human rights are risked by early irreversible medical interventions when they are performed for socially normalizing or cosmetic reasons that are not medically essential (e.g., Amnesty International, 2017; Council of Europe Commissioner for Human Rights, 2015; European Union Agency for Fundamental
The central concern here is with unwanted irreversible surgical interventions, conducted on people too young to be consulted for informed consent. For example, Congenital Adrenal Hyperplasia (CAH) is an autosomal recessive genetic condition, that affects adrenal function and requires daily and lifelong medication. Nobody contests such life-saving interventions. In addition, among children with 46 XX genotype, CAH can also affect anatomical traits such as clitoral size and fusion of the labia. Medical interventions, beyond those necessary to save life or manage fluids leaving the body, can be performed to normalize genital appearance in such children. These are the kinds of interventions that are said to infringe a child’s rights to bodily integrity and to future self-determination (Carpenter, 2016).

Whilst such medical interventions are described as offsetting the harmful risks of social stigma, the medical literature itself does not describe the dynamics of stigma that justify such interventions. Human rights critiques of medical interventions do not describe stigmatization or public understanding in empirical terms either. The present study aims to address the neglected area of public understanding of intersex (see Liao & Simmonds, 2014 for a call for such studies).

For thirty years, social scientists have studied healthcare professionals who espouse benevolent reasons for medical interventions on intersex traits, such as assuaging the anxieties of parents about stigma, and avoiding the possibility that the child will face unbearable stigma later on (e.g., Gough, Weyman, Alderson, Butler, & Stoner, 2008; Karkazis, 2008; Kessler, 1990; Liao, Hegarty, Creighton, Lundberg, & Roen, 2019; Roen & Hegarty, 2018; see Roen, 2019 for a recent review). In this literature, social scientists have repeated pointed out how language use in medical contexts implies the pathology of intersex variations, and creates a conceptual framework within which medical interventions appear urgently necessary and singularly benevolent. A consequence of this framing is that other
understandings of intersex variations are made less available. We were informed by this literature as we examined understandings of the umbrella terms used in this area and demographic and psychological predictors of opinions about medical and social responses to intersex traits and intersex people.

Framing Stigma

The social psychology of stigma provides a broader context for understanding how people make sense of intersex variations and the controversial medical responses that are brought to bear on them. Social psychologists understand stigmatized traits to be those that can reduce a person in the minds of others “from a whole and usual person to a tainted, discounted one” (Goffman, 1963, p. 3). Research in sociology and social psychology has long shown that stigmatized traits (a) can be framed as something physical to be concealed or ‘fixed’, requiring ‘passing’ that minimizes their social impact, (b) can be creatively constructed as a basis for collective identity pride, or (c) can be used as a basis for becoming a tokenized representative of those with the relevant stigma (Goffman, 1963; Tajfel, 1978). The way stigma is framed can affect medical decision making; people with short stature more often elect to undergo painful ‘corrective’ medical intervention in countries where no social identity is available more than in those countries where such social identities are long standing (e.g., Fernández, Branscombe, Gómez, & Morales, 2012). Sociologist Sharon Preves (2003) developed an analysis of stigma in this area that noted that intersex-identified people had begun to form such a social identity approach in the 1990s, and that this identity seemed similar to LGBT identities in some regards.

Only very few studies of lay people have examined stigma or understanding about intersex, but those studies have shown that intersex traits can be framed in either medical or psychosocial terms, affecting how people conceptualize the harms and benefits of medical interventions. Streuli, Vayena, Cavicchia-Balmer and Huber (2013) asked trainee doctors to
make hypothetical decisions about a child born with intersex traits, framed within either a medical or psychosocial framework. Most trainees chose surgery in the former condition, but most rejected it in the latter condition. Hegarty, Bogan-Carey and Smith (2019) examined UK students’ reactions to YouTube videos featuring first-person accounts of people with intersex traits. Students preferred the video with the social identity frame, and their beliefs about medical harms and benefits were affected by the videos’ messages. Lundberg, Dønåsen, Hegarty, and Roen (2019) conducted focus groups in which people wrestled with ‘ideological dilemmas’ about determining a baby’s sex, and disclosing an intersex diagnosis to a young person. Participants drew upon both biomedical and social identity framings of intersex to resolve those dilemmas. All three studies suggest that lay people possess the basis for conceptualizing intersex either in medical terms, as something that needs to be ‘repaired’ or ‘corrected’, or in social terms, as something that needs to be protected from harm, and which could ground a minority social identity. In the present study this distinction was addressed via a nomothetic analysis of the meanings of contested ‘umbrella terms,’ and individual differences in opinions about medical and social responses to people with intersex traits.

**Conceptualizing ‘Umbrella Terms’**

We studied the meanings of language terms in this domain because different framings of stigma appear to be encoded in different ‘umbrella terms,’ none of which seems to perfectly meet the needs of all affected individuals, families and communities. This study of the language terms that ordinary people know, and their associations to these terms, can inform and empower interventions to communicate about intersex in public domains. In the first part of our survey, participants reported their associations to three ‘umbrella’ terms that experts disagree about in this area: *hermaphrodite, intersex*, and *dsd*. 
The ancient term *hermaphrodite* is now considered stigmatized by most (see e.g., Jones, 2017). Although including this term risked justifying the use of a pejorative term about a stigmatized group, this term was ‘reclaimed’ by some intersex activists in the 1990s and afterwards (Chase, 1998), and classics scholars have proposed some merit to reclaiming an understanding of it to empower intersex people in the present (e.g., Zajko, 2009). Google Ngram suggested that *hermaphrodite* was used more frequently than *intersex* or *dsd* (Ngram, n.d.), and we were required to use the term to communicate about our research to members of our university research office who were unfamiliar with *intersex* and *dsd*, and with whom we had to distinguish the topic in question from transgender. In short, we were required to use *hermaphrodite* as a ‘sensitizing construct’ to complete this research (Blumer, 1954) leading us to conclude that public understanding might be organized around this term and could be occluded if we did not include it in the study. The second term, *intersex*, has roots in Goldschmidt’s (1917) animal studies and was used widely in medical diagnostic language throughout the 20th century, but has been preferred by many human rights groups and social scientists since the 1990s. In a recent large study of the United Kingdom’s LGBT population, 1,980 people, or 2% of the sample, identified as ‘intersex’ (Government Equalities Office, 2018). In 2006, a new medical consensus, known as the Chicago Consensus Statement, rejected the term ‘intersex’ as a confusing and potentially stigmatizing term, instead opting for the umbrella term ‘disorders of sex development’ (Lee et al., 2006, see Davis, 2015 for a critical account of this meeting). ‘DSD’ was rapidly adopted by healthcare professionals and biomedical researchers following this consensus statement (Pasterski, Prentice, & Hughes, 2010). However, a ten year update to the Chicago Consensus Statements shows considerable disagreement among experts as to the appropriateness of the term, and the meanings that it communicates. A persistent concern in these discussions is that the use of an acronym
including the term ‘disorder’ can enhance the form of stigma that medical intervention is supposed to alleviate (Delimata, Simmonds, O'Brien, Davis, Auchus, & Lin-Su, 2018).

Surveys in several countries have shown that very most people who are, or could be identified as having a dsd diagnosis preferring diagnosis specific terms (e.g., Turner’s Syndrome) over the term ‘dsd’ (e.g., Bennecke et al., 2020; Davis, 2014; Lundberg et al., 2018; Simmonds, 2012, see also Delimata et al., 2018). In one study, ‘intersex’ appealed more to laypeople with no personal experience in this area than to ‘experts by experience;’ young people diagnosed with dsd conditions and their parents and carers. This difference emerged because laypeople underestimated the ease of taking up ‘intersex’ as a social identity among experts by experience (Lundberg et al., 2018). These studies suggest that people with intersex traits and their family members might adapt language use to different social contexts, including healthcare interactions.

In contexts such as this, where there are gulfs between experts’ preferred terminology and lay people’s common sense understandings, empirical studies of term’s conceptual structure (Medin, 1989) can empirically describing the gap between expert and lay understandings (Kelley, 1992). We asked participants to report their immediate associations to hermaphrodite, intersex, and dsd here, using the frequency of their mention of different associates to describe the terms shared and distinct meanings for lay people, informing expert debate about the likely consequences of using particular terms in public communication.

**Explaining Variation in Public Opinion**

The second section of the survey assessed demographic and psychological predictors of opinions about medical and social responses to intersex traits. Among the empirical studies of framing intersex stigma described above, only Hegarty et al. (2019) examined a psychological individual difference as a predictor of lay people’s preferred framing of intersex. In that study, students who rejected a binary gender belief system were both more
critical of medical intervention and more open to receiving diverse framings via first-person narratives. The present study examines a broader range of predictors in a more diverse sample of the public.

We examined both demographic and psychological predictors of several medical and social interventions aimed at reducing the societal stigma that people born with intersex variations can encounter. Some specific clinical guidelines already state that demographic factors such as social class, education and ethnicity will augment parental anxiety, suggesting that medical interventions might be more essential for children in non-White, working class, and religious families (Ahmed et al., 2015). Cools et al. (2016, p. 408) critiqued LGBT groups’ involvement in debates about early medical intervention as infringing human rights, voicing concern that the Council of Europe statement on human rights cited above, by critiquing medicine, “might lead ordinary families and people living with these conditions … [to] withdraw from (medical or psychological) care and/or social interactions.” Because this field already includes statements that refer to demographic characteristics as a basis for understanding intersex, we examined nationality, gender, sexual identity, age, ethnicity, religion, educational achievement, social class, parental status and experiences of healthcare work experience here.

We also examined five psychological predictors of opinions. First, Right-wing Authoritarianism (RWA) is a personality and ideological variable assessing both willingness to submit to authority, to aggress on its behalf, and social conventionality (Altemeyer, 1996). Because people who score highly on RWA are generally intolerant of the free expression of minority identities, we predicted that higher RWA would predict support for early medical intervention, and opposition to social forms of support that might require intersex traits to be openly discussed. Although there is a literature examining RWA and opposition to human rights initiatives (Twose & Cohrs, 2015), little of this research examines human rights at risk
through medical practice. RWA has been found to predict both homophobia and transphobia (Adams, Nagoshi, Filip-Crawford, Terrell, & Nagoshi, 2016, Norton & Herek, 2013; Tee & Hegarty, 2006; Whitley, 1999).

Second, we presented Tee and Hegarty’s (2006) Beliefs about Gender Scale, which measures the beliefs that there are only two gender categories, and that membership in those categories is defined by genital anatomy. Derived from Garfinkel’s (1967) classic sociological work on implicit cultural beliefs, two items on this scale are of particular relevance; *Even a person with ambiguous genitalia is still either male or female,* and *It’s just a social norm to assign babies to a gender based on what their bodies are like.* Belief in the gender binary has been found to be correlated with transphobia, heterosexism and RWA in the UK and USA (Elischberger, Glazier, Hill, & Verduzco-Baker, 2018; Tee & Hegarty, 2006). Following from Hegarty et al.’s (2019) results among students, we predicted that endorsing gender binary beliefs would predict support for early medical intervention, and opposition to non-medical social support for people with intersex traits.

Third, we measured *intolerance of ambiguity,* a component of *need for closure,* which is a psychological orientation towards firm answers to questions and aversion to ambiguity (Kruglanski, 1996). Intolerance of ambiguity is associated with political conservatism in both the USA and UK (Jost, Glaser, Kruglanski, & Sulloway, 2003), and may be causally related to occupational stress among healthcare professionals who routinely encounter ambiguity in their work (Iannello, Mottini, Tirelli, Riva, & Antonietti, 2017). Research has long suggested that early medical intervention is a social response to parental anxiety, whilst waiting to decide in favour of such interventions requires considerable tolerance for uncertainty (Karkazis, 2008; Roen, 2008, 2019; Roen & Hegarty, 2018). We predicted that higher tolerance of ambiguity would predict support for early medical intervention, and explored its relationship to opinions about other currently less common social responses.
Fourth, as medicalized approaches to intersex characteristics presume the authority and benevolence of medicine, we developed a measure of attitudes to medical authority for this study. We predicted that participants with positive attitudes to medical authority would endorse surgical solutions more. Fifth and finally, as human rights challenges explicitly call for legal limitation on ‘cosmetic’ medical interventions (e.g., Amnesty International, 2017), we assessed whether positive attitudes to cosmetic surgery would predict positive opinions to early medical interventions on intersex traits. In sum, the second part of the survey aimed to map demographic variation in support for and opposition to medical and social responses to people with intersex traits, and to assess which psychological variables best predicted group differences in those opinions.

Method

Participants. We aimed for a stratified sample including equal numbers of women and men from the UK and USA, and to oversample LGB+-identified individuals, parents, and healthcare workers, each at 25% of the total sample. In May and June, 2017, 336 Prolific Academic users responded to our survey. Whilst we sampled LGB+-identified participants and parents effectively, fewer healthcare workers were available to sample by this method than we had hoped. We excluded four participants who withheld consent, 61 who didn’t respond to the items about umbrella terms or the survey items, and based analyses on the remaining 271 participants.

Gender, sexuality, ethnicity and religiosity were reported using open-ended items and were not restricted. Participants’ own terms for their identities are in the supplementary materials, as are the decisions we made to categorize them for statistical analyses as women (n = 140) or men (n = 131); as White (n=228) or non-White (n=43); and as non-religious
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(n=169), Christian (n=84), or non-Christian Religious (n=18); and as heterosexual (n = 209) or LGB+ (n = 62). We use LGB+ rather than ‘LGBT’ here as this participant group were defined by sexual identity not gender identity, and there were too few transgender and non-binary participants to construct a meaningful group. Age ranged from 18 to 67 years (M = 34.7, S.D. =11.0 years). All participants were located in the UK (n = 139) or USA (n = 132).

Participants’ highest educational achievement was no formal qualifications/some secondary education (n = 42), completed secondary education (n =74), Undergraduate (n = 106), Masters’ (n=38) or Doctoral degree (n=10). We collapsed the last two of these groups to construct a 4-point scale of educational achievement. One person did not respond to this item. Participants reported their social class as working-class (n = 116), middle-class (n=147), or upper-class (n = 7). The latter two groups were collapsed to create a binary social class variable. Eighty-two participants were parents, whilst 189 were non-parents. Thirty-nine had healthcare work experience, whilst 232 had no experience of healthcare work.

Materials. The survey instrument is reproduced in the Supplementary Material. It first asked participants to report their familiarity with anyone born intersex or considered to have a disorder of sex development, familiarity with professionals in this area, and if the participant themselves were a member of such groups. Next, participants were asked to respond to the three umbrella terms; hermaphrodite, intersex, and disorders of sex development, by first indicating if they had heard each term before, and then writing up to ten associations to each term. The order of screens was manipulated and randomly assigned. Participants responded to the umbrella terms in one of six possible order conditions.

Participants were next briefed that they would be presented with opinion statements adapted from news articles, research reports and policy statements, and would be asked for their opinions about matters of expert disagreement. Intersex characteristics were described in greater detail and participants were briefed that the survey would use the term ‘people with
intersex characteristics’ henceforth. We drew upon expert sources to construct descriptions of medical and non-medical responses and opinion statements. Consistent with calls for participatory research in intersex studies (e.g., Intersex Human Rights Association Australia, N.D.), the third, fourth, fifth, and sixth authors were ‘experts by experience’ who co-designed these items. The attributions of survey content to expert sources and co-authors are in the Supplementary Material. The next five screens each presented a short description of an existing medical or societal response to intersex characteristics and a series of Likert items assessing attitudes toward that response. These screens were always presented in the same sequence and referred to the medical response of early genital surgery (8 items), parents’ responses to the birth of a child with intersex traits (9 items), support groups for people with intersex characteristics (10 items), the legal prohibitions on medical interventions (8 items), and social equality responses (8 items). All opinion items were presented as 7-point scales ranging from 1 (Strongly Disagree) to 7 (Strongly Agree). Verbatim items appear in the Supplementary Materials.

Next, participants completed the items that made up the five standardized psychological measures that we assessed as predictors of attitudes to those responses to intersex traits. In all cases, items on these scales were presented as 7-point scales ranging from 1 (Strongly Disagree) to 7 (Strongly Agree). These five scales were Major, Sibley, & Louis (2010) 14-item Right Wing Authoritarianism (RWA) scale (α = .91), Tee and Hegarty’s (2006) 9-item Beliefs about Gender Scale (α = .87), 9-items measuring Tolerance for Ambiguity from Kruglanski, Atash, De Grada, Mannetti, & Pierro’s (1997) Need for Closure scale (α = .82), a 6-item measure of attitudes to medical authority for this study whose items are in the Supplementary Materials (α = .77), and Henderson-King & Henderson-King’s (2005) 15-item Acceptance of Cosmetic Surgery Scale (α = .94).
As the topic of this survey was original, and we anticipated participant upset as a possible ethical risk of administering it, the next screen assessed experiences of the survey. Three forced-choice Yes/No response items asked participants if they felt they had gained understanding about people with intersex characteristics, if they had learned new information, and if they would like to know more about such people. A fourth item asked if participants had changed their opinion whilst completing the questionnaire. Open-ended items invited participants to expand any Yes answers. Finally, an open-ended item asked participants What factors do you think most informed the opinions you expressed today?

The next screen re-presented the eight opinion items from the earlier screen on medical response of early genital surgery. Participants completed a single forced-choice Yes/No response item indicating if they would answer these items differently now, and an open-ended item asking why their opinion had changed or had stayed the same.

The final screen included the demographic items in regard to age, gender, if gender was as assigned at birth, transgender status, nationality, sexual identity, experience working in a healthcare setting, and parental status. Political views were assessed on 7-point scales ranging from Left-Wing to Right-Wing (UK only) or Liberal to Conservative (USA only). Religion was reported as an open ended item, and religiosity on a 7-point scale ranging from 1 (Not At All Religious) to 7 (Very Religious). Participants reported their highest educational level and self-identified social class as working class, middle class or upper class.

Procedure

Recruitment information on Prolific Academic, and on the information sheet that preceded consent described the study’s goals:

to better understand what people know, understand, and think about intersex. Intersex used to be called hermaphroditism and has lately been called ‘disorders of sex development’ (DSD) in medical circles. Both intersex and DSD are umbrella terms
that can describe external genitalia, internal reproductive anatomy, hormonal levels, and genetic chromosomes.

We used Prolific users’ prior registration of their demographic characteristics to stratify the sample without their awareness. Sixty-four identical questionnaires were available to participants selected by country (US vs UK), gender, sexuality, parental status, healthcare experience, and highest educational achievement. The debriefing screen thanked participants, described the design and sampling strategy, presented links to several organizations with the caveat that “these organizations do not agree with each other on all points,” and invited email contact with the researchers.

**Results**

*Familiarity with Intersex and DSD.*

Few of the 271 participants included in the analysis knew an intersex person (n = 20, 7.4%), knew a professional (n = 12, 4.4%), or identified as intersex themselves (n = 1, 0.4%). These familiarity items were presented first, and 53 of the 61 excluded participants answered them. Five of these 61 knew an intersex person (9.4%), three knew a professional (5.6%), and four identified as intersex themselves (7.5%). Thus, four of five intersex-identified people who accessed the survey exited it early on.

*Familiarity with Terms.*

More participants reported familiarity with the term *hermaphrodite* (252 or 271, 93.0%), than with *intersex* (168 of 271 terms, 62%), or *disorders of sex development* (58 of 271 or 21.4%). One-way ANOVA with *umbrella term* as a within-subjects factor found that more associations were prompted by *hermaphrodite* and by *disorders of sex development* (both $M = 3.25$ terms) than by *intersex* ($M = 2.99$ terms), $F(1, 270) = 5.03, p = .03, \eta_p^2 = .02$.

Two methodological findings merit brief discussion next. First, more associations were produced in response to terms with which participants were familiar rather than
unfamiliar. This was the case with *hermaphrodite* ($M$s 3.32, 2.32 terms, $S.D. = 2.18, 3.06$ respectively), $t (269) = 1.87, p = .06$, *intersex* ($M$s 3.31, 2.49 terms, $S.D. = 2.30, 2.33$ respectively), $t (269) = 2.82, p = .005$, and *disorders of sex development* ($M$s 4.00, 3.06 terms, $S.D. = 2.12, 2.28$ respectively), $t (268) = 2.83, p = .005$. Second, more associations were produced to terms encountered earlier in the survey. One-way ANOVAs with 1st, 2nd and 3rd order position as a single between-subjects variable showed this pattern in regard to *hermaphrodite* ($M$s = 3.70, 2.93, 3.11 associations, $S.D. = 2.28, 2.12, 2.43$ respectively), $F (2, 268) = 2.88, p = .06, \eta_{p}^{2} = .02$; *intersex* ($M$s = 3.98, 3.19, 1.81 associations, $S.D. = 2.61, 2.06, 1.75$ respectively), $F (2, 268) = 23.20, p <.001, \eta_{p}^{2} = .15$; and to *disorders of sex development* ($M$s = 3.69, 3.29, 2.77 associations, $S.D. = 2.09, 2.64, 2.77$ respectively), $F (2, 268) = 3.76, p = .03, \eta_{p}^{2} = .03$.

**Associations to Umbrella Terms.**

We examined the associations to umbrella terms inductively with the goal of describing the terms’ common and distinct meanings. We constructed alphabetical lists of all participants’ 1457 distinct associations to all three umbrella terms, considering associations using the same linguistic stem to be equivalent (e.g., *confusion* and *confusing*). The first author and a research assistant then induced a category structure for these associations with two levels including four larger categories and sixteen sub-categories. One coder coded all responses, and a second coder independently coded responses from 90-91 participants for each umbrella terms (i.e., 1/3 of the data). Reliability was moderate or strong for all 16 sub-categories (Cohen’s $\kappa$ range = [.609, .905], $M = .75$, see Supplementary Materials). We used the first coder’s analysis here. A complete list of terms triggering the categorization of each free response to each large category and sub-category is contained in the Supplementary Material.
Table 1 shows the count and percentage of participants who listed associations that we categorized in each of the four larger categories ((1) Biological and Medical Features; (2) Sex, Gender, and Sexuality; (3) Psychosocial Experience; and (4) Natural and Cultural History), and in each of the sub-categories in response to any and to each of the umbrella terms. Global Cochran’s Q tests determined which of these proportions differed by umbrella term, and Kruskal-Wallis tests determined which proportions were significantly different (applying the Bonferroni correction such that each $\alpha = .017$).

These tests reveal which aspects of the umbrella terms’ meanings are shared or distinct with respect to each of the four larger categories. All terms call to mind Biological and Medical Features, but intersex does so less than the other two terms. DSD calls to mind more references to medicalization. Hermaphrodite refers more to anatomical features, and less to genes and hormones than other terms. Intersex prompts more references to Sex, Gender and Sexuality than the other two terms. Intersex prompts more references to binary sex ambiguity and to transgender and non-binary but not more references to sexuality or gender role behaviour. References to Psychosocial Experiences are more common in response to dsd than the other two terms, largely because dsd prompts many more references to children and development. All terms prompt more references to negative than to positive emotions. However, dsd prompts fewer references to stigmatization than the other terms, particularly hermaphrodite. Finally, Natural and Cultural History associations are more common to the term hermaphrodite.

Finally, we categorized participants’ synonyms; their responses to the umbrella terms that mentioned other umbrella terms. About one quarter of participants produced such responses and they were produced most often for DSD, less for intersex, and least of all for hermaphrodite. Hermaphrodite and intersex appeared as synonyms of each other and for dsd, but dsd never appeared as a synonym for either of the other two terms.
Opinions about Diverse Responses to Intersex

The second part of the survey examined opinions about diverse responses to intersex. We first report on the factor structure of the opinion variables, next report on demographic and psychological predictors of those opinions, and finally present regression models showing which variables predict unique variance in opinions about diverse responses.

Principal components factor analysis was performed on each set of items assessing opinions about diverse responses to intersex traits. We only analysed factors with Eigenvalues greater than 1.0, and examined scree plots to consider which factors to retain. Where relevant, we used varimax rotation to inform decisions about which individual items loaded on which opinion factors. We assessed reliability with Cronbach’s alpha (α). The supplementary materials include means, standard deviations, details of the factor analysis and factor loadings for all individual items.

First, a single reliable measure of Opinions about Medical Responses was constructed from seven of the eight medical responses items. The item with the highest loading on this measure was Medical procedures, such as surgery, are in the best interests of children with intersex characteristics. Second, the items on parental responses did not yield a single factor. We retained a 3-item scale labelled Sympathy with Parental Distress and a 2-items scale labelled Belief in Effective Parenting (both α = .62). The highest loading item on each scale read Parents should be offered advice and tips on how to deal with grandparents, siblings, babysitters and others who may query their child’s genital appearance and Parents who accept their children as they are and empower them with support, protect children with intersex characteristics from harm more than surgery does respectively. We interpreted these measures mindful of their lowered reliability. Third, all ten items formed one reliable measure of Opinions about Support Groups, (α = .87), whose highest loading item read One-on-one contact with another person having similar experiences can be the most important
factor in someone with intersex characteristics having positive feelings about themselves.

Fourth, all eight items formed one reliable measure of *Opinions About Legal Prohibition* whose highest-loading item read *I think that irreversible surgeries on children with intersex characteristics can infringe their human rights* ($\alpha = .88$). Finally, all eight items were included in the reliable *Opinions about Social Equality Responses* measure, whose highest-loading items read *Intersex support groups should be consulted in the development of legislation and policies that impact on the rights of people with intersex characteristics*. In sum, the five sections of the survey yielded six measures of opinions about diverse responses to people with intersex traits. For all opinion scores, higher scores indicated a positive opinion about the relevant response.

Table 2 presents correlations between the six opinion measures. Opinions about responses were positively correlated with each other overall, with the exception that opinions about medical intervention were negatively correlated with opinions about all other responses. These correlations suggest a conceptualization of medical vs. social responses to intersex such as that described in the introduction.

**Demographic Predictors of Opinions.**

We next examined ten demographic variables to see if any predicted these opinions. These variables were nationality, gender, sexual identity, age, ethnicity, religion, educational achievement, social class, parental status, and healthcare work experiences.

**Nationality.** First, independent samples t-tests showed that UK participants had significantly more favourable opinions than USA participants toward medical interventions ($M_s = 4.38, 4.10, S.D. = 1.03, 1.17$), $t(269) = -2.12, p = .04, d = .17$; toward support groups ($M_s = 5.32, 5.07, S.D. = 0.80, 0.79$), $t(269) = -2.40, p = .01, d = .29$, and toward social equality responses ($M_s = 5.33, 5.70, S.D. = 0.80, 1.06$), $t(269) = -3.28, p = .001, d = .40$. All
other national differences in opinions about all social responses were non-significant, all $t < 1.6$, all $p > .13$.

**Gender.** Second, t-tests showed that men’s opinions about medical intervention were more positive than women’s opinions ($M_s = 4.41, 4.08, S.D. = 1.03, 1.16$), $t (269) = -2.43, p = .02, d = .30$. However, women endorsed several social responses more than men. Women expressed more sympathy towards parents than man ($M_s = 5.85, 5.54, S.D. = .86, .98$), $t (269) = 2.79, p = .006, d = .39$, women believed more in parenting effectiveness than men ($M_s = 4.27, 3.92, S.D. = 1.29, 1.34$), $t (269) = 2.18, p = .03, d = .26$, and women had more positive opinions about support groups than men ($M_s = 5.34, 5.04, S.D. = .85, .90$), $t (269) = 2.88, p = .004, d = .35$, and more positive opinions about social equality responses than men ($M_s = 5.72, 5.30, S.D. = 1.03, 1.17$), $t (269) = 3.77, p < .001, d = .46$. There was no significant gender difference in support for legal limitations on medical practice, $t (269) = 1.46, p = .14$, but results otherwise show a small-to-medium effect size with men preferring medical responses and women preferring social responses.

**Sexual Identity.** The largest, and most consistent demographic predictor of differences in opinion was sexual identity. Heterosexual participants had more positive opinions about medical responses than LGB+ participants did ($M_s = 4.41, 3.68, S.D. = 0.99, 1.28$), $t (266) = 4.75, p < .001, d = .63$. However, LGB+ participants, more than heterosexual participants, showed greater sympathy for parents ($M_s = 5.94, 5.64, S.D. = .83, 95$), $t (266) = -2.30, p = .02, d = .29$, and greater belief in parenting power ($M_s = 4.59, 3.95, S.D. = 1.01, 1.23$), $t (266) = -3.42, p = .001, d = .47$. LGB+ participants also had more positive opinions of support groups ($M_s = 5.52, 5.09, S.D. = .85, .88$), $t (266) = -3.39, p = .001, d = .50$, of legal limitations ($M_s = 5.38, 4.44, S.D. = 1.16, 1.11$), $t (266) = -5.76, p < .001, d = .82$, and of social equality responses ($M_s = 5.93, 5.39, S.D. = .83, .95$), $t (266) = 4.01, p < .001, d = .60$ than their heterosexual counterparts. In sum, sexuality robustly predicted medium-to-
large differences on almost all opinion scales with heterosexual participants preferring the medical response and LGB+ participants preferring all five social responses. Accordingly, to avoid confounds with sexual identity, we excluded non-heterosexual participants from the analysis of other demographic factors with which sexuality was significantly associated.

**Age.** Heterosexual participants were on average about four years older than their LGB+ counterparts in the sample ($M_s = 35.71$ vs $31.42$, $S.D. = 11.56, 8.06$ years respectively), $t(269) = 2.73$, $p = .007$, $d = .43$. When we analysed age among heterosexual participants only, Pearson correlation showed no significant relationship between age and any of the opinion measures, all $|r| < .13$, all $p > .07$. We did not analyse age further.

**Ethnicity.** T-tests revealed no significant differences between White and non-White participants, all $t < 1.4$, all $p > .18$. Ethnicity was not considered further.

**Religion.** There was a higher proportion of heterosexual participants among the Christian participants (75 of 84, 89.2%), than the non-religious (123 of 169, 72.7%) or non-Christian religious participants (11 of 18 participants, 61.1%), $\chi^2 (2, N = 271) = 12.46, p = .003$. Accordingly, we analysed heterosexual-identified participants’ data only. One-way ANOVA showed a small marginally-significant differences between the three religious groups in sympathy for parents, $F(2, 206) = 2.89, p = .06$. $\eta^2_p = .027$, but Tukey’s test revealed no significant differences between group means. ANOVA revealed no significant effects of religion on any other opinions, all $F < 2.2$, all $p > .11$. We did not analyse religion further.

**Educational Attainment.** Pearson correlation showed no significant relationship between the 4-point measure of educational achievement and belief measures (all $|r| < .11$, all $p > .07$). Educational attainment was not analysed further.

**Social Class.** T-tests revealed greater belief in support groups among working-class than upper/middle class participants ($M_s = 5.34, 5.09$, $S.D. = .82, .93$ respectively), $t(268) =$
2.32, $p = .02$, $d = .29$. This effect was small and all other class differences were non-significant, all $|t| < 1.4$, all $p > .27$.

**Parental Status.** Few LGB+ participants were parents ($n = 4$). Consequently we compared parents and non-parents among heterosexual participants only. T-tests found no significant differences in opinions, and parenting status was not examined further, all $|t| < 1.6$, all $p > .12$.

**Healthcare Work Experiences.** T-tests showed no significant difference in opinions among those with and without healthcare experience, all $t < 1.4$, all $p > .18$. This variable was not examined further.

In sum, these analyses identified sexual identity as the most robust of ten demographic predictor of opinions. There were significant gender differences in most opinions, significant national differences on some opinion measures, and very few others significant demographic differences at all. Gender and national differences were not consequences of confounds with sexuality; there was an equal proportions of heterosexual-identified participants among women and men (76.4%, 77.8%), and among UK and USA participants (76.2%, 78.0%), both $\chi^2 < 1$.

**Psychological Predictors of Opinions.**

We next examined psychological predictors of individual and group differences in opinions using correlation and linear regression. Table 3 first presents correlations between opinions about the six responses to people with intersex traits and the five psychological variables and political orientation and religiosity. As predicted, participants with high RWA, Gender Beliefs, and political conservativism scores all supported medical intervention significantly more and supported social responses significantly less. Attitudes to medical authority and to cosmetic surgery were both positively correlated with opinions about medical responses, but did not with opinions about the social responses. Need for closure was
the only variable that predicted support both for early medical intervention, and for all social responses. Less religious participants had more positive attitudes to legal prohibition of medical interventions, but religiosity was otherwise not predictive of opinions.

Six linear regression models were next calculated to determine which demographic and psychological variables predicted unique variance in opinions. In these models, nationality was coded as 1 (UK) or 2 (USA), gender as 1 (women) or 2 (men), and sexual identity as 1 (heterosexual) or 2 (LGB+). The models explained 15-52% of variance in responses (see Table 5). The psychological variables were the most consistent predictors of opinions about medical and social responses. The gender beliefs measure predicted significant variance across all six models, and was the most significant predictor of support for most of the social responses. RWA explained unique variance in four of the six models. Attitudes to Medical Authority and Attitudes to Cosmetic Surgery explained unique variance in Opinions about Medical Intervention whilst RWA did not. Tolerance for Ambiguity was the only psychological variable that was associated with positive opinions towards both medical responses and social responses. These variables fully accounted for the gender differences in all opinions other than women’s greater support for social equality responses. The psychological variables also accounted for most of the sexual identity differences, but only partially accounted for heterosexual-identified participants’ greater support for medical intervention or LGB+-identified participants’ great support for its legal prohibition. Similarly these variables did not fully account for greater support for both medical responses and social equality responses in the UK than in the USA. Religiosity now appeared as a suppressor variable, predicting unique variance in support for societal equality responses.

Participants’ experiences of the survey on this novel topic were largely positive. Most reported that participation increased their understanding (228 of 271 or 84.1%), and that they had learned new information (230 of 271 or 84.9%). Approximately one third wanted to
know more about intersex (91 of 271 participants, 34.3%). Only a minority reported that their opinion had changed whilst completing the survey (34 of 271 participants, 12.5%), or that they would answer the items on medical intervention differently than they had done earlier (54 of 269 participants, 20%). Only two participants contacted the research team. Both did so to compliment the goals of the survey.

**DISCUSSION**

The meanings that ordinary people, with no particular experience of intersex, attach to three umbrella terms; *hermaphrodite, intersex*, and *dsd*, have somewhat overlapping and somewhat distinct semantic meaning, justifying debate about how the choice of language might materially impact the dynamics of stigma. Furthermore, naïve people’s opinions about medical and social responses to intersex traits can be predicted by demographic and psychological variables. Such understandings are distributed unevenly among the public in the UK and USA according to sexual identity, political orientation, RWA, and beliefs about gender.

*Public Understanding of Umbrella Terms*

This study provides an empirical basis to go beyond experts’ guesswork about what umbrella terms such as *dsd* imply, and what using such terms might do in public communication (e.g., Delimata et al., 2018). Three empirical findings are particularly informative for improving public understanding in this area. First, whilst experts express clear preferences for some terms over others, newer, less familiar terms, such as *dsd*, prompt associations to older more familiar terms. Accordingly, countering stigma by inventing neologisms that are free of pejorative associations with older terms may reduce stigma less than is hoped, as can occur in other domains such as intellectual disability (Lyle & Simplican, 2015). These data can inform expectations about what more recent terms such as *variable sex characteristics* might do to alleviate stigma (Government Equalities Office, 2018).
Beyond preferences for umbrella terms, the present study suggests the need to examine what concepts language terms bring to mind when used in discourse in this domain (Lundberg et al., 2018). These three terms also have somewhat distinct prototypical referents (Rosch & Mervis, 1975), that are weighted towards entities that are not human (hermaphrodite), human adults with social identities (intersex) and human children in family contexts (dsd). Beyond confirming fears about the dehumanizing implications of hermaphrodite, our findings bear on experts debates about terms in several ways. First, intersex is not particularly associated with LGBT identities in general, but only with gender identities and not with sexual identities. Second, a difference between the terms dsd vs intersex may impact perceptions of the legitimacy of some medical interventions. Surgical interventions in infancy can be framed in terms of a dilemma between protecting a future child from stigmatization vs. risking a future adult’s sexual function (e.g., Weiseman, Ude-Koedler, Sinnecker, & Theyn, 2010). Nominating an infant’s variation as ‘dsd’ vs ‘intersex’ may draw to mind people of different ages, and foreground different phases of that infant’s futures, as decision-making occurs. The implications of dsd and intersex for the age of the person being discussed have received far less attention than other differences between these two umbrella terms. Third, these findings help to explain why people with intersex traits and family members do not have obvious preferences for terms, commonly switch between terms, or sometimes avoid them altogether as they perform diverse actions in distinct social contexts (Lundberg et al., 2018).

Public Opinions about Responses to Intersex

By isolating predictors of opinions about medical and social responses, these results fail to support assumptions that ethnicity, social class, and education are the important predictors of preferences for, or the suitability of, early medical intervention (Ahmed et al., 2015). Rather, sexual identity emerged as the clearest demographic predictor here. RWA and
Gender Beliefs moderated most of these sexual identity differences, consistent with studies showing relationships between RWA and tolerance for human rights abuse (Twose & Cohrs, 2015) and between gender binary beliefs and openness to social identity framing of intersex traits (Hegarty et al., 2019). Nonetheless, additional variables need to be investigated to account for why LGB+ people reject medical intervention and endorse social response more than heterosexual-identified people do.

Cools et al. (2016, p. 408) critiqued LGBT groups involvement in debates about early medical intervention as infringing human rights, voicing concern that LGBT groups might harm coalitions between families and medical and psychological experts. In marked contrast to these explicit fears about LGBT groups, these data suggests that parents of children diagnosed with dsd conditions are more likely to find sympathy and encouragement from LGB+ friends than from their heterosexual-identified counterparts. Similarly, the present data give no reason to think that such parents should look to other parents or to people with healthcare work experience for particular sympathy.

The ultimate goal of medical and psychological interventions in this area is to avoid and to alleviate the impact of stigma on psychological well-being, and those risks are understood to be located within social reactions to intersex traits. The present findings suggest that only medical and psychological experts who believe that people with intersex traits are best off when they receive medical intervention and no social responses (e.g., from loving parents, support groups, legal protections or social equality measures) have a rational basis to be concerned about LGB+ people’s involvement in the ecology of families with dsd children. These conclusions may be particularly relevant to policy actors who are seeking to support full inclusion for people with intersex traits beyond the remit of healthcare services (Government Equalities Office, 2018).
**Limitations and Future Directions**

This study had limitations that point directions for future research. First, whilst we lacked the resources for representative national samples, our findings about sexual identity can direct stratified sampling decisions in the future. Second, our sample did not allow meaningful empirical conclusions about transgender or non-binary respondents’ public understandings, but the associations of ‘intersex’ to these groups suggest the need for an investigation of this topic. Third, many statements emphasize that *disability*, like sexuality, may be a useful framework to scaffold public understanding of intersex, and we did not assess disability here (Kon, 2015). Finally, we wrote our survey with a close eye on existing expert writing, but past studies on the effects of linguistic framing in this area suggest our framing may have affected responses more than we or the participants realized (e.g., Hegarty et al., 2019; Roen & Hegarty, 2018; Streuli et al., 2013). The supplementary material provides ample scope for readers of this article to form concrete hypotheses about such framing effects. As our aim was to open up this neglected topic for further empirical study, we are keen to engage with readers with diverse perspectives who might formulate new hypotheses about public understanding of intersex in response to the work presented here.
References


Hall.


uncertainty tolerance, need for cognition, and their association with stress. A study among Italian practicing physicians. Medical Education Online, 22.

doi: 10.1080/10872981.2016.1270009


on minors: Interview study with clinical experts of differences of sex development.  

_BJM Open, 9, e025821. doi:10.1136/bmjopen-2018-025821_


Table 1: Participants’ Self-Identification and Categorization for Statistical Analysis

<table>
<thead>
<tr>
<th>Variable</th>
<th>Levels (n in brackets)</th>
<th>Participants Own Terms (n in brackets)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nationality: UK (139)</td>
<td>British (112), England/English (11), Scottish (5), United Kingdom/UK (4), Welsh (2), British European (1), British and one other nationality (1), GB (1), Northern Irish (1), White (1).</td>
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</tr>
<tr>
<td>USA (132)</td>
<td>American (71), United States/USA (55), USA &amp; one other nationality (2), Asian (1), Caucasian (1), Citizen of the Earth (1), Spanish (1).</td>
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</tr>
<tr>
<td>Gender: Women (140)</td>
<td>Female (137), F (1), Cis-Female (1), GenderFluid, mostly Female (1)</td>
<td></td>
</tr>
<tr>
<td>Men (131)</td>
<td>Male (128), M (2), Male/Demimale (1).</td>
<td></td>
</tr>
<tr>
<td>Sexuality: Heterosexual (209).</td>
<td>Hetero/Heterosexual (67), Female/Female Heterosexual (47), Straight (39) Man/Male/ Male Heterosexual (46), Straight Male (3), Female with Elaboration (3), Blank Response (2), He/His (1), Human (1), Lady (1), Straight Female (1), Straight with Elaboration (1).</td>
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<tr>
<td>Non-Heterosexual (62)</td>
<td>Bisexual (22), Gay (13), Lesbian (10), Homosexual (3), Pansexual (3), Sex/Sexual (2), Bisexual (Kinsey 1 or 2) (1), Female, Bisexual (1), Bisexual or Same</td>
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</tr>
</tbody>
</table>
Gender Loving (1), Fluid Sexuality (1), Gay/Homosexual (1), Intersex (1), Male or female (1), Pansexual (1), Queer or Gay (1),

Ethnicity: White (228).
White (151), Caucasian (44), White British (13), White Caucasian (7), British (2), English/White English (2), White/Caucasian non-Hispanic (2), European Caucasian/White (2), German, American (1), Human (1), White Hispanic (1), White skin (1), No response (1).

Non-White (43)
Asian (10), Hispanic (6), Black (5), Chinese (4), Mixed/Mixed Race (4), Black African (3), Black British/Caribbean (2), Native American and one other (2), African American (1), Asian British (1), Asian Indian (1), Hebrew Israelite Black American (1), Latin (1), Native American (1), South Asian (1).

Religion: Non-Religious (169)
None/Not Applicable/Blank Response (114), Atheist (37), Agnostic (15), Do Not Believe (1), Spiritual (1), Not Sure (1).

Christian (84)
Christian/Christianity (43), Catholic/Roman Catholic (22), Lutheran (3), Protestant (3), Baptist (2), Church of England/Anglican (3), Episcopal/Episcopalian (2), Lapsed/non-Practicing Catholic (2), Agnostic/Greek Orthodox (1), Born Again Christian (1), Evangelical Friends (1), Methodist (1).

Non-Christian Buddhism/Buddhist (5), Pagan/Wiccan (5), Jewish (2),
| Religious (18) | Islam (2), Hindu (1), Thelema (1), Other: Primitive Church (1), Veganism (1). |
Table 2: Percentage of Participants Producing Associates to Each of Three Umbrella Terms.

<table>
<thead>
<tr>
<th>Umbrella Term</th>
<th>Any</th>
<th>Hermaphrodite Intersex</th>
<th>DSD</th>
<th>Cochran’s Q</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Biological and Medical Features (Any)</strong></td>
<td>91.1%</td>
<td>75.3%</td>
<td>54.2%</td>
<td>68.6%</td>
<td>34.00</td>
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<tr>
<td>Reproductive and Sexual Anatomy</td>
<td>61.6%</td>
<td>42.1%</td>
<td>30.3%</td>
<td>36.5%</td>
<td>11.31</td>
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<tr>
<td>Genital Anatomy</td>
<td>53.5%</td>
<td>36.5%</td>
<td>20.3%</td>
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<td>22.21</td>
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<tr>
<td>Medicalization</td>
<td>30.6%</td>
<td>9.2%</td>
<td>10.0%</td>
<td>20.3%</td>
<td>21.64</td>
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<tr>
<td>Hormones and Genes</td>
<td>29.5%</td>
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<td>15.5%</td>
<td>17.0%</td>
<td>10.99</td>
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<tr>
<td><strong>Sex, Gender, and Sexuality (Any)</strong></td>
<td>76.0%</td>
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<td>57.9%</td>
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<tr>
<td>Binary Sex Ambiguity</td>
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<td>Sexual Behavior, Desire and Identity</td>
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<td>11.4%</td>
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<td>20.3%</td>
<td>35.8%</td>
<td>24.06</td>
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<tr>
<td>Children and Development</td>
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<td>8.9%</td>
<td>7.8%</td>
<td>26.2%</td>
<td>47.66</td>
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<tr>
<td>Negative Emotions and Distress</td>
<td>24.0%</td>
<td>9.6%</td>
<td>10.7%</td>
<td>12.9%</td>
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</table>

*Note: Means for umbrella terms differ significantly when they do not share a superscript (p <.05, Bonferroni corrected).*
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<table>
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<th>Umbrella Term</th>
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<tr>
<td>Biological and Medical Features (Any)</td>
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<td>75.3% (^b)</td>
<td>54.2% (^a)</td>
<td>68.6% (^b)</td>
<td>34.00</td>
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<td>Reproductive and Sexual Anatomy</td>
<td>61.6%</td>
<td>42.1% (^b)</td>
<td>30.3% (^a)</td>
<td>36.5% (^{ab})</td>
<td>11.31</td>
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<tr>
<td>Genital Anatomy</td>
<td>53.5%</td>
<td>36.5% (^b)</td>
<td>20.3% (^a)</td>
<td>26.2% (^a)</td>
<td>22.21</td>
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<tr>
<td>Medicalization</td>
<td>30.6%</td>
<td>9.2% (^a)</td>
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<td>20.3% (^{b})</td>
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<tr>
<td>Hormones and Genes</td>
<td>29.5%</td>
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<td>Sex, Gender, and Sexuality (Any)</td>
<td>76.0%</td>
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<td>55.4%</td>
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<td>26.2%</td>
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<tr>
<td>Sexual Behavior, Desire and Identity</td>
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<td>Psychosocial Experience (Any)</td>
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<td>p-Value</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>-------------</td>
<td>---------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Stigmatization</strong></td>
<td>14.4%</td>
<td>9.23</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Positive Emotions and Support</strong></td>
<td>4.8%</td>
<td>2.92</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Natural and Cultural History (Any)</strong></td>
<td>28.0%</td>
<td>80.90</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Flora and Fauna</strong></td>
<td>14.0%</td>
<td>59.42</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Celebrities and Popular Culture</strong></td>
<td>10.7%</td>
<td>10.29</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Mythology, History, and Art</strong></td>
<td>8.9%</td>
<td>35.08</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Synonyms</strong></td>
<td>25.15%</td>
<td>12.90</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: p-values marked with an asterisk indicate statistical significance.*
Table 4: Correlations Between Opinions about Responses and Psychological Variables

<table>
<thead>
<tr>
<th>Opinion</th>
<th>Medical Response</th>
<th>Sympathy for Parents</th>
<th>Effective Parenting</th>
<th>Support Parenting Groups</th>
<th>Legal Prohibition</th>
<th>Social Equality</th>
</tr>
</thead>
<tbody>
<tr>
<td>RWA</td>
<td>.38***</td>
<td>-.26***</td>
<td>-.30***</td>
<td>-.32***</td>
<td>-.46***</td>
<td>-.50***</td>
</tr>
<tr>
<td>Gender Binary Beliefs</td>
<td>.41***</td>
<td>-.31***</td>
<td>-.47***</td>
<td>-.47***</td>
<td>-.54***</td>
<td>-.66***</td>
</tr>
<tr>
<td>Tolerance of Ambiguity</td>
<td>.26***</td>
<td>.15*</td>
<td>.18**</td>
<td>.18**</td>
<td>-.04</td>
<td>.10</td>
</tr>
<tr>
<td>Medical Authority</td>
<td>.32***</td>
<td>-.01</td>
<td>.05</td>
<td>.05</td>
<td>-.08</td>
<td>.10</td>
</tr>
<tr>
<td>Cosmetic Surgery</td>
<td>.17**</td>
<td>.13*</td>
<td>-.01</td>
<td>.11</td>
<td>.00</td>
<td>.03</td>
</tr>
<tr>
<td>R-W/C Political Orientation</td>
<td>.30***</td>
<td>-.13***</td>
<td>-.25***</td>
<td>-.18**</td>
<td>-.34***</td>
<td>.20***</td>
</tr>
<tr>
<td>Religiosity</td>
<td>.09</td>
<td>-.10</td>
<td>-.05</td>
<td>-.09</td>
<td>-.18**</td>
<td>-.09</td>
</tr>
</tbody>
</table>

*Note: RWA = Right Wing Authoritarianism, R-W/C = Right-Wing/Conservative, *p < .05, **p < .01, ***p < .001.
PUBLIC OPINION ON INTERSEX

<table>
<thead>
<tr>
<th>Response to Intersex</th>
<th>Medical</th>
<th>Sympathy for Parents</th>
<th>Parenting Power</th>
<th>Support Groups</th>
<th>Legal Prohibition</th>
<th>Social Equality</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Predictors</strong></td>
<td>β</td>
<td>t</td>
<td>β</td>
<td>β</td>
<td>β</td>
<td>β</td>
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<tr>
<td>Country</td>
<td>-.33</td>
<td>-.25**</td>
<td>-.13</td>
<td>-1.13</td>
<td>-.22</td>
<td>1.31</td>
</tr>
<tr>
<td>Gender</td>
<td>.09</td>
<td>.71</td>
<td>-.16</td>
<td>-1.35</td>
<td>-.03</td>
<td>-.15</td>
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<tr>
<td>Sexuality</td>
<td>-.35</td>
<td>-2.45*</td>
<td>.03</td>
<td>.21</td>
<td>.21</td>
<td>1.10</td>
</tr>
<tr>
<td><strong>Demographic</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>RWA</td>
<td>.11</td>
<td>1.29</td>
<td>-.18</td>
<td>-2.64**</td>
<td>-.14</td>
<td>-1.45</td>
</tr>
<tr>
<td>Gender Binary</td>
<td>.25</td>
<td>4.04***</td>
<td>-.15</td>
<td>-2.55*</td>
<td>-.28</td>
<td>-3.35**</td>
</tr>
<tr>
<td>Tolerance</td>
<td>.15</td>
<td>2.38*</td>
<td>.19</td>
<td>3.18**</td>
<td>.11</td>
<td>1.23</td>
</tr>
<tr>
<td>Medical</td>
<td>.27</td>
<td>4.14***</td>
<td>-.05</td>
<td>-.80</td>
<td>-.21</td>
<td>-2.38*</td>
</tr>
<tr>
<td>Cos. Surgery</td>
<td>.13</td>
<td>2.92**</td>
<td>.08</td>
<td>1.93</td>
<td>-.03</td>
<td>-.42</td>
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<td>Politics</td>
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<td>.72</td>
<td>.04</td>
<td>1.04</td>
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<td>-.77</td>
</tr>
<tr>
<td>Religiosity</td>
<td>-.01</td>
<td>-.19</td>
<td>.02</td>
<td>.47</td>
<td>.05</td>
<td>.93</td>
</tr>
<tr>
<td>F (10, 257)</td>
<td>14.74***</td>
<td>5.49**</td>
<td>5.95 *</td>
<td>11.28***</td>
<td>14.64***</td>
<td>29.61***</td>
</tr>
</tbody>
</table>

\[F(10, 257) = 14.74***, \quad 5.49**, \quad 5.95^*\]

\[F(10, 257) = 14.74***, \quad 5.49**, \quad 5.95^*\]
Adjusted $R^2$  .34  .14  .16  .28  .34  .52

Note: $\beta =$ unstandardized Beta, RWA=Right Wing Authoritarianism, Gender Binary=Gender Binary Beliefs, Tolerance = Tolerance of Ambiguity, Medical= Attitudes to Medical Authority, Cos. Surgery. = Attitudes to Cosmetic Surgery, Politics = Political Orientation, $^*p<.05$, $^{**}p<.01$, $^{***}p<.001$.

$^1$ Degrees of freedom for this model are (10, 256) due to one missing data point.