

Pseudonymous Parents: Comparing Parenting Roles and Identities on the Mommit and Daddit Subreddits

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ABSTRACT

Gender equality between mothers and fathers is critical for the social and economic wellbeing of children, mothers, and families. Over the past 50 years, gender roles have begun to converge, with mothers doing more work outside of the home and fathers doing more domestic work. However, popular parenting sites in the U.S. continue to be heavily gendered. We explore parenting roles and identities on the platform Reddit.com which is used by both mothers and fathers. We draw on seven years of data from three major parenting subreddits—Parenting, Mommit, and Daddit—to investigate what topics parents discuss on Reddit and how they vary across parenting subreddits. We find some similarities in topics across the three boards, such as sleep training, as well as differences, such as fathers talking about custody cases and Halloween. We discuss the role of pseudonymity for providing parents with a platform to discuss sensitive parenting topics. We conclude by highlighting the benefits of both gender-inclusive and role-specific parenting boards. This work provides a roadmap for using computational techniques to understand parenting practices online at large scale.

Author Keywords

Reddit; gender; parenting; anonymity; pseudonymity; social media; language.

ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

INTRODUCTION

Many parenting websites, such as Babycenter.com and Parenting.com, are predominantly used by and advertised to mothers [57]. Parenting websites for fathers tend to be narrowly targeted as such, and are given names like Fatherly.com, MrDad.com, or GreatDad.com. This divergence reflects long-standing differences in social roles

and expectations that mothers and fathers have experienced [12,18,24,25,44,45]. Though gender roles have heavily converged more recently—with mothers working out of the home and fathers doing more domestic work—inequalities remain. On average, mothers continue to do more domestic work than fathers [40], an imbalance that may persist online. Indeed, research suggests that mothers discuss and manage family life more regularly than fathers on social media sites [1,23,36], perhaps reinforcing traditional gender roles and inequities.

This work investigates gender differences in parenting roles and identities online towards the goal of promoting more inclusive and involved parenting. We focus our inquiry on parenting discussions on the social news site, Reddit.com. Reddit is pseudonymous, allowing parents to disclose sensitive topics that they may not feel comfortable disclosing on sites like Facebook or face-to-face. It also places traditionally feminized topics—parenting and childcare—in an online environment that has been characterized as predominantly masculine [13,31]. In addition, the three major parenting subreddits are r/Parenting, r/Mommit, and r/Daddit (subsequently referred to as Parenting, Mommit, and Daddit, respectively), giving us a naturalistic environment in which to explore similarities and differences between them.

Using a dataset containing Reddit comments from 2008–2016, we draw on machine learning techniques to identify the topics parents discuss on parenting subreddits, and how topics differ across Parenting, Mommit, and Daddit subreddits. This research captures the kind of discussions parents are having and information they have sought and shared in recent years at large scale. The results of this work could be used by healthcare practitioners working with parents, social workers promoting father involvement, as well as family and gender studies scholars.

We find that some parenting topics are shared across subreddits, including naming a child, vaccinations, and managing work-life balance. However, others are gendered, with Daddit users discussing topics like custody legal battles and Halloween costumes and Mommit users discussing topics like losing pregnancy weight. We discuss opportunities enabled by pseudonymity for disclosing and discussing sensitive parenting topics. We also argue for more nuanced parenting platforms that are inclusive of mothers

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and fathers, and more broadly, for platforms that promote gender equity in childcare and domestic labor and roles.

RELEVANT WORK

Parenting norms and expectations in the U.S. have changed significantly over time. These historical changes are linked to large scale socioeconomic changes [56], such as the industrial revolution. As America became increasingly industrialized, the site of men's work moved outside the home and into the city [26,47], while women took on more domestic responsibilities [12].

This spurred the traditional breadwinning and domestic labor divisions that persist today (e.g., [12]). Thus arrived the "Standard North American Fatherhood" [26] in which fathers' main role was that of breadwinner. Mothers, meanwhile, became the central figure for child development. Publications extolling the centrality and joy of motherhood began to appear around the mid-19th century. In the early 20th century, the study of motherhood had been professionalized into a new area of study sometimes termed "mothercraft." In order to maintain the centrality of motherhood to women's lives, however, fathers' role was to "complement[s]" the parenting process through "cooperat[ing] with the mother" [26]. While motherhood was expected to be all-consuming for mothers, fatherhood was to be an avocation to men, an addendum to their central role of the breadwinner.

As mothers entered the labor market in the second half of the 20th century, fathers were expected to pick up the slack in domestic work. However, evidence from diary and survey studies (e.g., [43]) and qualitative studies showed that mothers in fact picked up what Hochschild and Machung term a "second shift" [18]. In other words, mothers were continuing to do more domestic work while also holding full-time work outside of the home. Today, as a majority of families have become dual-earner families [39], men have been investing more time in domestic work, essentially closing the labor gap.

Torr and Short, citing Greenstein [17], argue that one reason for minimal change in the division of housework is that men's (and perhaps women's) "gender ideologies" have not kept pace with changes in women's labor force participation. Studies of parenting online show how norms and expectations of parents—both mothers and fathers—impact what they decide to share online and with whom. In the sections below, we first examine how the opportunity to be pseudonymous online relates to parents' disclosure practices. We then describe differences in mothers' and fathers' use of social media sites related to parenting.

Parenting and Anonymity Online

Anonymity online is thought to have negative effects due to what Suler [52] terms the "online disinhibition effect" in which users engage in antisocial behaviors such as trolling and flaming [19]. However, anonymity can also be advantageous, especially "in advice and discussion threads

[where] anonymity may provide a cover for more intimate and open conversations" [7,27,51].

Though Reddit is largely anonymous, persistent identities means that users are likely to engage in a variety of self-presentation strategies. Prior work suggests that redditors use throwaway accounts to discuss sensitive topics like sexual abuse [5]. Following Goffman's dramaturgical tradition, self-presentation allows users to present their social roles, or the "part one is assigned to play" through their online interactions. Social network users engage in what Uski and Lampinen [54] termed "profile work" in which they manage self-disclosure risks through self-censorship, managing friend networks, and sending targeted messages to specific users. This public performance on social media sites [19,55] motivates users to post to the least common denominator in their network [20]; that is, users post content that they believe will be accepted by most audiences in their network. Parents must make decisions about how often they should discuss parenting and what topics are appropriate for discussion or not, both decisions that are heavily dependent on potential audiences online.

The pseudonymous nature of Reddit might defuse some of the worries associated with discussions about parenting experiences. Building on Hogan's [20] work on pseudonymity and context collapse, van der Nagel and Frith [37] argue that "pseudonymity can protect users' security while enabling them to participate freely online without the fears of 'context collapse' that come with using 'real names.'"

In an early report on technology design for families [15] mothers intimated that they wanted anonymous online communities because they "feared being judged or even reprimanded for not living up to a social ideal of motherhood." More recently, Schoenebeck [48] suggests that anonymity on YouBeMom.com allowed mothers to have an outlet which they might not otherwise have to counter societal motherhood norms. However, anonymity on a platform like YouBeMom comes at the cost of maintaining civil conversation at times, a challenge shared by other anonymous sites like 4chan [7].

Neither Foucault [15] nor Schoenebeck [48] focused on fathers and expectations of anonymity; however, subsequent studies have suggested that fathers do turn to pseudonymous social media sites such as Reddit to discuss parenting [2,3]. Ammari and Schoenebeck [2] find that fathers prefer to discuss controversial topics like sleep training, vaccinations, and breastfeeding on Reddit instead of real-name social networks like Facebook. However, their study drew on a relatively small sample of interview participants. In this work, we examine what topics parents discuss on a large scale when they are in a pseudonymous parenting environment. Thus, our first research question is:

RQ1. What topics do parents discuss when pseudonymous online?

Parenting Roles and Gender

Extensive prior work has suggested that mothers and fathers use the Internet and social media in different ways, such as mothers seeking health information more than fathers (see a review in [42]). Early studies of mothers online depicted their engagement with “mommy blogging” which allowed mothers to find social support and solidarity from other mothers online [29,35]. More recent scholarship has described privacy decisions mothers make when deciding what to share about their children online [23,34] and mothers’ use of Facebook groups for activities like buying and selling used children’s items [36]. Sharing information about their children helps mothers build social capital [42]; however, Gibson and Hanson [16] indicate that mothers also use social media to build an image of themselves that is distinct from that of being a mother by minimizing the use of social media as a “baby diary.”

Studies of fathers’ social media use suggests a number of similarities. Fathers blog about their fatherhood experiences and seek to connect with other fathers online [2]. However, studies of fatherhood also reveal significant differences, primarily centered on the lack of support and resources for fathers as compared to mothers [2,51]. For example, many parenting sites and groups cater primarily to mothers rather than fathers, leaving fathers looking for online spaces in which they are welcome [2,51]. Fathers prefer to ask parenting questions of other fathers who may better relate to quotidian questions like how to change a diaper. Fathers report that their Facebook networks consisted of professional ties who might not care about family photos [2]. Fathers also report being more concerned about sharing what might be perceived as “sexually suggestive” content, especially with regards to their daughters [2].

Taken together, we see both similarities and differences in parents online. However, this prior work on parenting online has been interview or survey-based (e.g., [2,3,16,23]), or has focused on a single demographic—either mothers or fathers (e.g., [34,40,51]). Here we extend that work in two ways: we ask whether mothers and fathers behave in similar ways when on a platform that caters to both groups, and we draw on empirical data traces rather than self-report data. Thus, we ask.

RQ2: In what ways, if any, do topics differ across mother-centric and father-centric parenting boards?

METHODS

Dataset

We used a publicly available dataset¹. The dataset included comments, usernames (pseudonyms), as well as timestamps and score (Karma). No other identifying information, such as gender, are given. These data were drawn from public

subreddits between 2005 and 2016. The first post on any parenting centered subreddit was in 2008 when r/Parenting was created. Activity on all three subreddits increased substantially in 2010. Figure 1 shows the growth in number of active users of all three subreddits throughout time. Out of a total of 37 subreddits related to the topic of parenting, we focused on three most prominent parenting subreddits: Parenting (1,483,368 comments, 70,105 threads, 84,431 unique users), Daddit (353,219 comments, 30,290 threads, 38,131 unique users) and Mommit (203,036 comments, 13,649 threads, 15,732 unique users). However, a variety of smaller, more diverse parenting subreddits exist such as r/SameSexParents, r/SingleParents or r/RaisedByNarcissists, which represent equally important communities.

LDA Topic Modeling for Topic Detection

The Latent Dirichlet Allocation (LDA) model [9] is used to extract latent topics in text documents. Text tokens are distributed over latent topics throughout the document. LDA has been used to extract topics in various settings. Paul and Dredze [41] used an LDA-based model to temporally and spatially track ailments across the U.S. Similarly, Chancellor et al. [10] use LDA to predict mental illness severity in social media posts. Lin et al. [28] used LDA to model topic drift across 10 subreddits as they became defaulted subreddits (subreddits chosen by centralized Reddit admins for new Reddit users to be automatically subscribed to).

We trained an LDA model using the Python genism package on the aggregate of all three subreddits in our study: Parenting, Mommit, and Daddit. The output of this model allows us to determine what redditors in the three parenting subreddits discuss. We created lexicons based on the topic models from this model. Given that there is a significant difference in the size of the subreddits being analyzed – see the dataset subsection above, we coupled the aggregated LDA model with three independent LDA models, one per subreddit, to provide a more complete picture of each subreddit. This allows topics that might be salient in one of the smaller subreddits – Daddit or Mommit – to be represented.

The LDA model outputs a set of topics, each represented by a set of keywords, which we refer to as lexical groups (LG). Table 1 shows the LG generated keywords, topic terms as well as comment examples from aggregated LDA model. This model was trained on the aggregated set of comments from the three subreddits. These lexical groups account for discussion trends on the three subreddits. The example quotes have been selected by finding comments with a high occurrence of the respective topics. Following, we describe how we calculated this score.

The goal is to measure the extent to which each comment on Reddit belongs to each of the LGs generated by the LDA

¹https://www.reddit.com/r/datasets/comments/3bxlg7/i_have_every_publicly_available_reddit_comment/

model. To do so, we create a score for each comment with respect to a LG by taking the Jaccard similarity between two sets of keywords. The first set of keywords is the LG. The second is the comment text after stemming and removing stop words. That is, given a lexical group and a comment, the score is $|LG \cap B| / |B \cup LG|$, where LG and B are the set of keywords in the lexical group and the comment, respectively.

Using these scores, we now quantify the extent to which a LG is present in a subreddit by taking the mean score of the comments in the subreddit with respect to the LG. For example, given the LG $x = ["mom", "dad", "parent"]$, which would represent a topic, and a comment $B = "Moms and dads try to do the best for their children."$ the score of B with respect to x would be

$$score = \frac{|\{mom, dad\}|}{|\{mom, dad, try, do, best, child, their, parent\}|} = 2/8 = 1/4$$

In order to determine if a topic is a reasonable representation of the subreddit contents, each of the comments in the dataset is scored as shown above. We then read a random selection of comments representing the topic in question (this is done by finding submissions with high and moderate topic scores). If the random selection represents a reasonable connection to the LDA topic in question, then the topic will be added as another verified topic. In total, we found 47 verified topics (LGs) for the aggregated LDA model. This process is repeated for Daddit and Mommit.

If similar topics appeared in the independent LDA models for each of the subreddits, we want to understand the differences between these discussions on different subreddits. These differences represent the variations between Daddit and Mommit when discussing the same topic. In order to measure this variation, we use embeddings from Word2Vec models applied independently to each of the subreddits. Following is a review of the Word2Vec model.

Word2Vec Word Embeddings for Subreddit Similarities

Documents can be modeled as semantic spaces where vectors represent the semantic similarity between words. Mikolov et al. [32,47] introduced the Word2Vec word embeddings algorithm, an unsupervised algorithm based on the distribution principle [14,22], which assumes that words that appear in closer proximity are semantically similar and used in similar contexts. In other words, as Mandelbaum and Shalev [30] explain, "the simplest property of embeddings obtained by all the methods described above is that similar words tend to have similar vectors."

We trained three independent Word2vec models on each of the subreddits. This allowed us to view each as a separate document, thus providing a better sense of the similarity between vectors within the same space (within the same subreddit). By comparing the cosine similarity to specific terms from word embeddings of different subreddits (based on LDA topic words), we can provide a richer description of

the differences and similarities between the three subreddits in discussing parenting topics.

We used the embeddings from each of the independent models to describe the differences that arose in discussions of the same topics across different subreddits. To do so, we used a keyword (or more, depending on the topic) and listed the closest words to it. The closeness of the words was determined through using the following command in python: `Word2vecmodel.most_similar(topic_term)`.

Note on Gender and Language

Many scholars agree that gender exists on a spectrum rather as a binary. A significant limitation of analyzing online datasets such as this one is that gender is necessarily classified into categories. For readability, we adopt those assumptions here, including that Mommit is oriented towards mothers who go by she/her/hers and that Daddit is oriented towards fathers who go by he/him/his. Parents whose gender identity does not align with those labels are not attended to in this analysis. In future work, we want to consider different approaches for analyzing large datasets while acknowledging the complex and nonbinary identities and roles associated with parenting.

RESULTS

The first parenting subreddit, Parenting, was created in April 2008. Though parenting was inevitably discussed on Reddit prior to 2008, we begin our analysis with the birth of that subreddit. Later, two other major parenting subreddits were formed, namely, Daddit in August 2010 and Mommit in September 2010.

The growth in the size of these subreddits can be measured via monthly unique active users (MAU). An MAU is one who has posted at least one comment to a subreddit throughout that month. Using MAU provides a more conservative estimate than number of subscribers and also does not account for lurkers on the subreddit. Figure 1 shows the monthly growth of Parenting, Mommit, and Daddit.

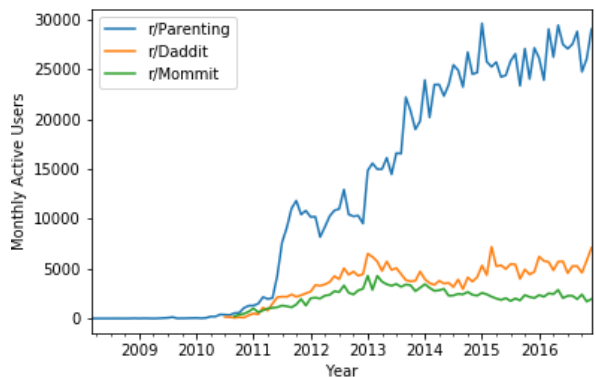


Figure 1. Parenting subreddit monthly active users (MAU).

RQ1. What topics do parents discuss when pseudonymous online?

This section presents the topics identified from the LDA model trained on the complete corpus of parenting

Lexical Group and Topic Terms	Example
Birth: "hospital", "birth", "nurse", "c-section", "epidural", "induce", "push", "midwife", "contractions"	"Our first child was born at a hospital which was pretty much a birth factory," with a c-section rate north of 40%. Our doctor and all staff ...told us that we'd be able to have a entirely natural childbirth throughout all parental visits."
Sleep Training: "sleep", "night", "bed", "time", "hour", "wake", "nap", "room"	"I'm a night owl, so the sleep schedule hasn't been too difficult to adjust to."
Vaccination: "vaccine", "study", "people", "risk", "children", "child", "article", "smoke", "research", "effect"	"The H1N1 virus (swine flu) is in the news right now. With all the talk about the vaccine and the potential side effects being discussed in the news right now in the media, it is time to discuss how to keep yourself and your special needs child healthy."
Circumcision: "son", "pierce", "pain", "body", "cut", "penis", "infect"	"I am circumcised. My son is not. My wife didn't want a circumcision but I did. We went back and forth about it and I decided I didn't really have any good reasons for wanting a circumcision."
Breastfeeding: "feed", "milk", "pump", "breastfeed", "nurse", "bottle", "breast"	"Is this formula that you are feeding him? How much does he eat throughout the day (total ounces per 24 hours)?"
Diaper: "cloth", "diaper", "wear"	"I used a mix of cloth diapers and disposable diapers. I can give you my honest opinion about both since I used both."
Potty Training: "clean", "potty", "time", "poop", "diaper", "train", "day", "house"	"Pooping can be one of the hardest parts of potty training. At best, you get maybe one or two chances a day to practice getting it right."
Child Looks: "hair", "dark", "brown", "skin", "dye"	"My husband's hair is brownish black and his eyes are a dark hazel. our son is blond and blue eyed. my hair is a dark blonde or very light brown and my eyes are blue."
Milestones: "walk", "month", "crawl", "move", "hold", "head"	"My son is 7 years old and absolutely refused to draw representationally until about three months ago."
Hair-skin care: "hair", "cut", "clip", "nail", "oil", "shampoo"	"My daughter brought mutant head lice from Mars home from a friend's house with her one day a few weeks back. We ended up treating them with tea tree oil after OTC shampoos failed to work."
Car-seat: "seat", "car", "rear", "install", "safe", "belt", "fit", "recommend"	"Rear-facing [car seat] protects om a frontal crash and in side crashes....I will concede the rear crashes are rarely serious"
Movies: "watch", "show", "movie", "cartoon", "disney", "commercial", "star"	"my son will be 4 at the end of the month. He loves the Avengers & X-Men. I really don't think he fully understands everything that goes on, which is... the reason for I'm comfortable letting him watch."
Children Books: "book", "read", "story", "song", "animal", "picture", "library"	"We read almost from the beginning...before age 1, reading was more of a distract-baby of playtime thing. After that it became more of a relaxing thing to do."
Cheap Products: "buy", "get", "store", "cheap", "good", "store", "new", "shop"	"My biggest tip is to buy used – craigslist, garage sales, ebay (great for cheap cloth [diapers!]) goodwill/thrift stores etc."
School: "school", "teach", "class", "high school", "math", "program"	"Shop for elementary schools now. Find one that has a gate program that will include advanced kindergarten readers."
Language skills: "language", "speak", "culture", "swear", "learn", "pick", "canada", "europe", "china", "america"	"I've been speaking nothing but Finnish to our 2 kids since their birth. Our eldest is now 4.5 years old and is totally fluent in both English and Finnish."
Teen transition: "sex", "teen", "talk", "gender", "private", "male", "female", "body", "norms", "daughter"	"give them the talk around middle school. Teach them sage sex. While you probably won't approve of sexual activity in say, grade nine, you can at least control how they're doing it. Condoms, condoms, condoms....and consent!!!!"

Table 1. Select topics from aggregated LDA model. The topic is provided along with key words from the LDA model and a quote as an example of the topic. The quotes were chosen to show the context of the topic. They were selected from comments with high scores for each of the respective topics.

interactions on Parenting, Daddit and Mommit. We organize the topics into eight main areas: (1) Birth, milestones, and transition to teen years; (2) Discipline or abuse; (3) Judgment; (4) Play and competition; (6) Purchase suggestions; (7) Faith and family (8) Posting norms. Table 1 includes a selection of the topics identified in this model. The remainder are listed in the subsections that follow.

Birth, milestones, and transition to teen years

Intuitively, many parents join Parenting subreddits at the time of the birth of their child. Parents, both mothers and fathers, talk about their birth experiences and interactions

with doctors and midwives, etc. Over time, parents talk about bathing their children, cutting their children's nails, sleep training, diapers, and potty training. Milestones also present a chance for parents to make sense of their children's development. The question of milestones at times was linked to discussions about vaccinations and circumcision (discussed in the next section). Most of these early discussions revolved around young children—from newborn to toddlerhood. Some parents were grappling with going back to work and transitioning to daycare and later school. Parents also discussed the changes that children go through in their teen years, especially with relation to having the "sex

talk” with their children. This relates to explaining to their children the dangers of posting sexually explicit pictures online or sharing them with others. Figure 2 shows the heat map for LDA topics over the three subreddits. It shows that sleep training is discussed most on Mommit followed by Daddit, while the breastfeeding topic comes up most commonly on Mommit. Figure 3 shows the heat map for topic models: milestones, teen talk, and discipline. We can see that while milestones are discussed by Mommit users (and less so by Daddit users), both teen talk and discipline seem to be discussed at higher rates in Parenting. One interpretation is that parents choose to discuss shared issues faced by mothers and fathers on Parenting.

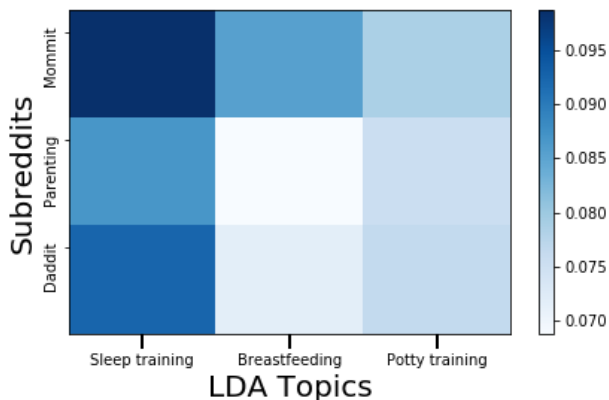


Figure 2. Sleep training, breastfeeding and potty training average score heat map. Mommit had the highest score for sleep training, and breastfeeding topics, followed by Daddit.

Discipline or Abuse?

Discipline was also one of the topics that appear in parent discussions on Reddit. The topic terms for this lexical group are [“behave”, “punish”, “hit”, “spank”, “consequences”, “teach”]. One of the threads that arose in discipline discussions revolved around abuse. One redditor talks about her experience working with children with special needs to introduce some of the mechanisms used to instill discipline in children. Others gave their feedback on how to best deal with children biting others. Yet others discussed the appropriateness of spanking as a disciplinary method. One commenter notes that while he is interested in “no-spank[ing] techniques for my own child”, he goes on to note that spanking is not abuse. What was the dividing line between stern discipline and abuse? The question of physical methods of discipline was one of the issues connecting discipline to abuse. The topic terms for the abuse lexical group are [“abuse”, “legal”, “custody”, “ex”, “law”, “lawyer”, “case”]. The questions here ranged from questions about gaining custody of children, especially when the parent thinks a child is being abused. The discussion weaves to questions about social services and CPS etc. Some parents questioned when they were being (mis)judged for what they thought were acceptable parenting techniques.

Judgment

This topic spans both discussions between parents about judgment that parents are facing in their lives, but it also included comments where parents were judging others on the subreddit. The topic terms in this lexical group are [“judge”, “people”, “say”, “fuck”, “wrong”, “mean”]. For example, one redditor started her comment with “okey [sic], I’m going to give you my secret weapons that have helped me survive with my mother in law.” Another reassures a mother, “you are not a bad mother...and you need to stand up to your ex on this one.”

Playing and competition

The topic of play made a showing in the topics discussed on Reddit. The first lexical model is play, and the topic terms for it are [“park”, “play”, “neighbor”, “house”, “family”, “walk”]. Mostly, these Reddit submissions revolved about discussing spaces for children to play outside, especially within the parents’ neighborhoods. One poster says “my husband and I live in [a] town home...there are lots of kids, and they’re always out back. They do backyard camping and all of that cute stuff.” Another strain of discussions about play is centered on competition in play, with the following topic terms [“play”, “kid”, “lose”, “game”, “competition”, “win”, “learn”, “soccer”, “sports”, “bike”]. One father gives “some soccer coaching advice” while another talked about how children might be nervous about making mistakes and losing soccer games. Other parents discussed games they bought for their children as gifts.

Purchase suggestions

Parents provided others with suggestions for car seats, children’s books, toys, movies, and pets. The discussions not only included links to specific products, but at times went into details to explain how to correctly use some of the products. For example, parents went back and forth discussing the correct way to fasten a car seat. They referenced external sources such as carseatblog.com. Table 1 contains some of the categories involved under this topic (movies, cheap products, and child books).

Faith and family

Parents also discussed faith in their role as parents. The topic terms for this lexical group are [“religion”, “religious”, “church”, “christian”, “catholic”, “mother”, “father”, “husband”]. Parents shared details about their upbringing, both religious and secular. For example, “I had the opposite experience, I had very religious parents trying to teach my atheist self to believe in the holiday.” Others talked about some tensions between religious parents and less religious children.

Online Interactions

Posting norms on parenting subreddits was one of the topics represented in the aggregated LDA model. The topic terms associated with this lexical group are [“post”, “article”, “share”, “remove”, “moderator”]. While some redditors shared images of their children and themselves on Daddit and Mommit, others argued against doing so. For example,

one commenter noted that it was not about the content, but “who may [be] lurking on different sub[reddits].”

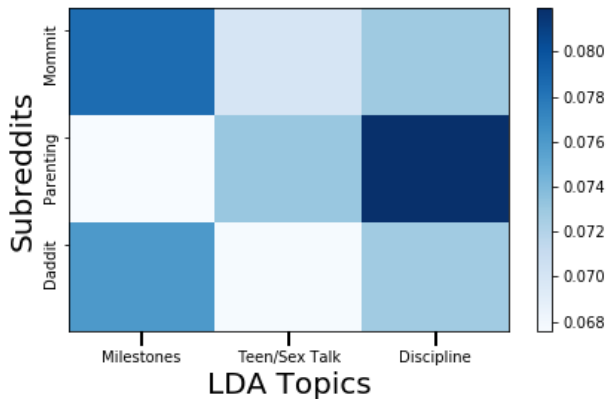


Figure 3. Milestones, teen talk and discipline average score heat map. Mommit scored highest followed by Daddit for the topic Milestones. Parents scored higher for teen talk and discipline topics.

Other posting norms included whether the authors should be allowed to link to their personal blogs. Eventually, moderators in Daddit, Mommit, and Parenting decided to allow parents to point to their personal blogs only if the content of the link is relevant to the discussion at hand. Links to information and other online resources (e.g., parenting meetup groups) were shared between parents on all three subreddits. Finally, there was also a norm of congratulating new parents into parenting subreddits. The heat map shown in Figure 4 below shows that congratulatory posts were heaviest in Daddit, the father-centric subreddit. Daddit posts varied in detail. While some Daddit users provided the gender and birth date of the child, others shared pictures of their children, sometimes with them and/or their partners in the picture.

RQ2: What are the differences in how redditors comment on mother-centric and father-centric subreddits?

In the next section, we discuss topics that appeared in both Daddit and Mommit independent LDA models, but not in the aggregated LDA model (detailed in the earlier section).

Mommit-specific topics

The Mommit independent LDA model shows that Mommit users focus on: (1) Child weight gain; (2) recovering from the pregnancy losing weight gained during pregnancy; (3) maintaining the home with a new child.

Child weight gain

Mommit users measured and compared the weight gains of their children, especially for the first few months. For weight gain, the topic terms include [“weight”, “lbs”, “size”, “eat”, “healthy”, “gain”, “worry”, “doctor”, “normal”]. For example, a Mommit user argues that “kids will self-regulate their food intake. They won’t eat if they’re not hungry unless you teach them to. Trust him to determine how much he

needs unless he goes up to, say, the 70th percentile in weight without changing his height percentile much.”

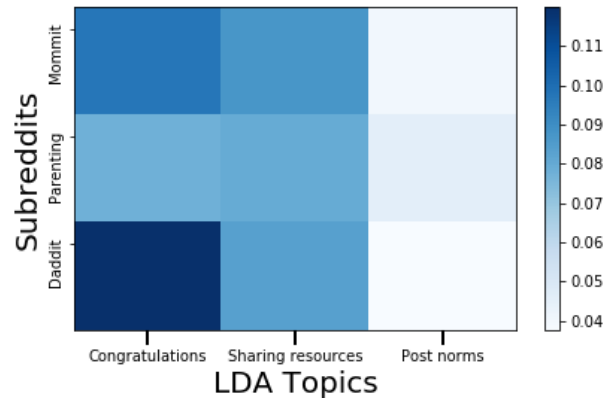


Figure 4. Reddit and social media discussions average score heat map. Daddit scored higher than either of the other subreddits on the congratulate new parents topic.

Recovering from birth and losing pregnancy weight

While mothers were recording and comparing weight gain for their children, they were also recording and discussing strategies to lose pregnancy weight. Mommit users also discussed their experiences in regaining a state of normalcy after giving birth was identified in two topics in the Mommit LDA model.

The first was recovery from the birth process. The second was the weight loss topic model which included the following terms [“body”, “pregnancy”, “look”, “back”, “feel”, “exercise”, “size”, “fit”, “lost”] while the recovery topic model included the following terms [“c-section”, “vagina”, “emergency”, “surgery”, “heal”, “scar”, “risk”, “breech”, “healthy”, “stich”, “remove”, “second”, “operation”]. An example of the issues discussed by Mommit users is a post by a mother talking about her last birth experience, “I had a multiples birth (twins) via C-section... all in all, it was a **very** pleasant experience as far as cutting your abdomen cut open goes.”

Maintaining the home

This topic focused on the keeping the house tidy after the child is born. Mommit users describe their routines in maintaining the home while at the same time noting that there is an inevitable fall in standards. The topic terms here were [“room”, “clean”, “house”, “keep”, “toddler”, “chore”, “laundry”, “bathroom”].

Daddit-specific topics

Our analysis of the Daddit independent LDA model showed that Daddit users talked about; (1) experiences in the NICU (2) legal questions for custody battles and (3) Halloween costume tips.

NICU experiences

Fathers posted about their experiences in the Neonatal Intensive Care Unit (NICU). The topic terms included: ["nicu", "born", "home", "hospital", "strong", "weight", "oz", "guy", "heart"] and only appears in the Daddit independent LDA model. It covers a time when the mother might also be hospitalized, busy, or unwilling to post about this to social media sites.

Legal custody questions and experiences

This topic is specific to the experiences they or their family/friends have gone through in their respective custody and adoption legal problems. For example, one Daddit user says 'my brother ... did some documentation (but not enough my fucking [sic] parents kept saying it wasn't ethical; now his lawyer is like "I wish we had...")'. The topic terms are ["ex", "father", "family", "loss", "adoption", "help", "lawyer", "support", "court", "CPS"].

Halloween!

The next topic is far less acrimonious and revolves around their preparations for Halloween. The topic terms are ["costume", "lawn", "Halloween", "dress", "rock", "star", "witch", "mask", "lullaby"]. For example, one Daddit user says "Baby Fett is awesome. My daughter is gonna be Darth Vader and I'm dressing as the Emperor. Dress up as Jango/Boba Fett and you should have an awesome father-child costume!"

Common Topics

We found five LDA topics to be similar between Daddit and Mommit: namely (1) posting to social media; (2) preparing food; (3) circumcision; (4) vaccinations; and (5) naming children. These topics might also be found in the aggregate model as identified in the first section in addition to the Daddit and Mommit independent LDA models.

Posting family photographs to social media

Photographs feature as one of the topics from the LDA model. Comparing the cosine similarities for the term "photo" on Daddit and Mommit, we see that terms like "picture", "pic", "profile", and "selfie" appear on both boards. Both Daddit users and Mommit users discuss self-presentation norms and expectations around posting photographs on sites like Facebook. For example, consistent with prior research [1,23], Mommit users discussed what photographs to share on Facebook and other social media sites. One user noted, "I want to have pictures of my kid growing up. I want to remember that it isn't always smiles and laughs. I take pictures of her in all moods and levels of health. I don't post everything, but I have been known to post a picture of her when she was sick because her grandpa (my dad) likes to see her daily and he simply can't figure out Skype." Another discussion topic on Mommit was about boundaries for children as they start using social media.

Daddit users also discussed sharing pictures on social media. In fact, one father discussed how he decided to stop sharing pictures with his mother on Facebook, saying 'I've had this argument with my mom. 'But it's my grandson, I have every

right to share his picture'. That got her 'grounded' on Facebook and she only gets a 5X6 and a wallet size when we get them done at sears every six months. I've tried to explain to her that sharing a picture on Facebook is not the same as keeping one in your wallet or phone to brag about him. She friends anyone and everyone who sends her a request, even my ex-wife who doesn't need photos of my family.'" Daddit users discussed more technical questions such as the types of cameras to use (e.g., 'dslr', a digital single lens camera). Daddit users also discussed methods for backing up and sharing pictures through Picasa and Flickr. A number of Daddit users posted pictures of themselves and their children through Picasa links.

Taken together, our results are consistent with prior work showing that parents are making a number of privacy and identity decisions about what to share about children and families online; however, there are also some subtle differences in what topics appear on Mommit and Daddit, such as Daddit containing more technical discussions about photography.

Preparing Food

Food was also one of the important discussions the subreddits. One of the main differences between Daddit and Mommit when it comes to food lies in that mothers asked mostly about food for children of younger ages. However, fathers were also interested in asking about foods for older children, especially for preparing snacks. In fact, the vector for the word snack is the 4th most similar when fathers discussed food. As for mothers, snack is relegated to the 39th most similar word. Instead, the closest vectors describe preparing food for infants (purée, solids, vegetable etc.).

Circumcision

The topic circumcision is detected in the general LDA model as well as the independent LDA models for all three subreddits. In Daddit, the word vector produced includes terms like "circumcision", "cosmetic", "intact", "mutilation", "uncut", "genitalia", "Phimosis", "abort", etc. In Mommit, terms include "male", "belief", "mutilation", "female", "genitals", "perception", "FGM", "culture", "society", etc. Looking through the list of closest words to circumcision, we can see that there is a main difference between the father-centric subreddit (Daddit) vs. Mommit. Note that Mommit maintains some balance with regard to female genital mutilation (FGM), while the word lists for Daddit show a specific interest with male circumcision. The closest vectors in Daddit also show more interest in the medical side of the circumcision process. For example, phimosis, urinary tract infections (UTI) and other health issues are discussed. For example, one Daddit user listed a few of the medical benefits of circumcision from his source (a relative trained as a pediatrician): "(1) A decreased risk of urinary tract infections. (2) A reduced risk of sexually transmitted diseases in men... (3) Prevention of phimosis (the inability to retract the foreskin)..." Numerous posts and comment threads see similar discussion and debate.

Vaccinations

Vaccinations were identified as topics in the aggregated LDA model, as well as for the Parenting and Mommit independent LDA models. On Daddit, the word vector included “HPV”, “disease”, “STD”, “autism”, “HIV”, “pertussis”, “statistics”, “UTI”, “flut”, “abort”, “diagnosis”, etc. On Mommit, the word vector included “disease”, “statistic”, “measles”, “vax”, “MMR”, “unvaccine”, “pertussis”, “polio”, “claim”, and “outbreak.”

The overlap between the Mommit and Daddit vectors shows that they both are interested in preventable diseases related to vaccines (e.g., measles). However, Daddit comments seem to have an interest in discussing the HPV vaccine specifically as well as questions about the efficacy of circumcision as an HIV vaccine. As an example, one user says, “That the relationship between circumcision and the transmission of HIV is that the very least unclear is illustrated by the fact that the US combines a high prevalence of STDs and HIV infections.” On Daddit, some vaccine discussions appear to be connected to circumcision discussions, whereas on Mommit they are more focused on issues related to immunization. The following quote is from a discussion started by a mother who is afraid that her child might have mumps even though she has taken her vaccinations. Another mother answers, “Herd immunity is certainly on the decline.” She advised the mother who asked the question to inquire about mumps outbreaks from doctors in the area.

Naming children

Choosing the appropriate name for children also provided some differences between mother-centric and father-centric subreddits. The Daddit word vector included “nickname”, “pronounce”, “Irish”, “stripper”, “surname”, “spell”, and “grandmother.” The Mommit word vector included “nickname”, “pronounce”, “Chinese”, “heritage”, “grandfather”, “letter”, “popular” and “hipster.” Concerns seem to be the same in the first three vectors, namely, nicknames, pronunciation, and a link to an ethnic background (e.g., Irish, Chinese). However, fathers also discussed whether the name they picked for their daughter might be considered a “stripper name.” For example, in one discussion about daughter names, a commenter starts “Savannah is a stripper name. I’m sorry, but it is. It’s like Desiree. Also, there are no good nicknames except Vanna.”

DISCUSSION

We began with the concern that many societal norms and expectations about parenting roles may be perpetuated online. Prior work establishes that most online parenting communities are marketed to mothers rather than fathers (e.g. BabyCenter) [2], causing fathers to carve out their own sub communities online (e.g., [3]). Reddit is unique from other parenting sites in that it provides a rich natural experiment for examining gender identities and roles. Here we show how these differences impact parenting online, and argue for the merits of gender-neutral parenting platforms. However, perhaps counterintuitively, we also argue that gender or role-specific boards play an important role in

family life, especially for supporting diverse and stigmatized parenting experiences.

In particular, our results suggest that gendered experiences on sites like BabyCenter are socially constructed rather than innate. In other words, mothers and fathers can inhabit similar spaces online, contributing to similar discussion topics, but that the norms and cultures of sites may have evolved to preclude them from doing so.

Discussing sensitive parenting topics

Pseudonymity on Reddit enables parents to discuss topics that they might consider too sensitive or controversial to discuss in other contexts. Ammari and Schoenebeck argued that fathers “tended to avoid divisive topics like sleep training, vaccinations, and breastfeeding” when posting to their Facebook accounts [2]. Our results indicate that these topics are discussed on all three boards, indicating different norms for what is appropriate to post on Reddit as compared to Facebook. This may be explained by Reddit’s subuded identity cues which facilitate discussion of sensitive topics like sexual assault [5]. It might also be explained by reduced effects of context collapse when fathers post to Reddit as opposed to real-name social network sites like Facebook.

Our models indeed show that topics like circumcision and vaccines, which are known to be controversial topics (e.g. [38]) and which many parents avoid discussing on Facebook [2,16,34], are commonly discussed on Reddit. For the most part, prior HCI research has advocated for sites that support anonymity in asking sensitive questions, especially related to health (e.g., [5,11,50]). While some controversial topics like vaccinations risk threatening public health [33], we do not see evidence of in-group, conspiratorial attitudes that Mitra et al. observed in their study of similar discourses [33].

Building on prior scholarship [48], we argue that Reddit’s pseudonymity supports discussion of such sensitive topics. Fathers may not have significant support for discussions of these topics in other contexts like Facebook or YouBeMom [2]. For example, we found that discussions of vaccines on Daddit focused on the HPV vaccine. This result reflects research in public health literature. Thomas et al. [53] found that mothers were twice as likely as fathers to administer the HPV vaccine to their sons. Reddit provides a platform for social scientists and public health practitioners to determine challenges faced by fathers and ways to engage them.

Daddit as supportive community

Prior work suggests that mothers do more routine childcare while fathers do more interactive childcare [8,46]. We find some evidence that fathers are engaging in interactive activities, such as Halloween costumes. Halloween has been described as the “ultimate dad holiday” [21] where fathers work with their children on creating their own costumes and elaborate lawn decorations. This echoes prior work showing fathers engaging in do-it-yourself (DIY) activities as part of their fatherhood roles [4]. We also see evidence of general support among fathers, such as the “congratulations” topic

where the arrival of a new child is celebrated. While fathers were excited about becoming parents as evident by the prevalence of the congratulations topic to new fathers (see Figure 4) on Daddit, they continue to be under engaged in day-to-day interactions with very young children. Reddit might provide fathers with a platform to learn about and negotiate parenting roles.

Traditional norms on Mommit

Our Mommit LDA model results indicate that Mommit users looked for health information, such as weight gain expectations for a young child. This finding is in keeping with the findings of Plantin and Daneback [42], who argue that mothers seek more health information than fathers. Mommit users also discussed chores around the house and the general decline in the state of housework after the birth of the child. This indicates that traditional social roles—moms doing early childcare work [18]—are extended on Reddit. Mothers are still discussing work associated with “the second shift” on Reddit, especially after the birth of a child. Future work could conduct field experiments on Reddit to test whether cross-pollination of topics might promote father involvement in traditional female labor.

Differences between Mommit and Daddit

A number of topics are shared across boards, such as questions about child-rearing. Though more work is needed, we see some evidence that mothers are engaging in more early childcare discussions (e.g., puréed foods vs. fathers discussing snacks) but by the time children reach adolescence, differences diminish. For example, discussions about teenagers and discipline are widespread on Parenting as compared to Mommit or Daddit. This may also reflect parents’ evolving identities: parents become a mother or a father, typically when a new baby is born, but over time that identity becomes stable. In contrast, questions about good parenting remain salient for all parents throughout adolescence [6].

However, we see that important differences emerge between Daddit and Mommit users in the independent Word2Vec models. As mentioned above, Mommit users talked about puréed foods while Daddit users talk about snacks. Similarly, Mommit users talked about both female and male genital mutilation and circumcision, whereas Daddit users focused on male circumcision. Perhaps most critically, we see differences emerge around parental rights, namely, fathers discussing custody problems. Mothers have historically been granted custody rather than fathers [49]; as a result, fathers may rely on sites like Reddit to seek information and social support. Prior work indeed shows that fathers outside of the traditional family structure (e.g., divorced fathers, stay-at-home dads) look for support from other fathers online [2,3]. Ammari and Schoenebeck argue that “Public sharing in social media can threaten fathers’ self-image.... Anonymous venues where fathers can feel comfortable sharing might help overcome the perceived stigma and judgment [they might experience] on real-name sites” [2: 1912]. Our results

provide empirical evidence of a valuable role Daddit can play in providing a platform for fathers to advocate for their involvement in family life.

LIMITATIONS AND FUTURE WORK

One limitation that could be addressed in future work is analysis in the differences that might arise from the use of throwaway accounts [27] on parenting subreddits. If parents reserve specific parenting questions or discussions to throwaway accounts, that might provide more information about what parents deem safe to share pseudonymously, and what they would rather share completely anonymously.

Another limitation of this work is that we do not know gender identity of an individual user and therefore do not know gender representativeness across each of the three boards. Our early efforts to capture this information revealed that we cannot robustly detect gender based on usernames. As a result, our results speak to gender norms associated with the labeling of each subreddit: “Mommit”, “Daddit”, or “Parenting”. Only Daddit specifies a gender in its description, saying “This is a subreddit for Dads. Single Dads, new Dads, Step-Dads, tall Dads, short Dads, and any other kind of Dad.”

This work provides a roadmap for bridging machine learning techniques to understand other family relationships (e.g., LGBT parents). Reddit supports a number of boards that support diverse parenting roles such as r/SingleParents, r/SingleDads, and r/Samesexparents. These boards are newer and less trafficked and also may bear specific nuances not captured in our models. An important next step would be to combine quantitative and qualitative approaches to examine needs and difference across the types of boards. An additional important next step would be to examine when parents want a board specifically for people similar to them (whether by gender or other identity markers) versus when they want to interact with diverse parents.

This speaks to the underlying motivations of this work we put forth at the beginning of this paper. When the most popular parenting boards in the U.S. are predominantly used by mothers, gender inequities may be perpetuated by society expecting mothers to care more about parenting, and by relegating fathers to be secondary figures in childcare and domestic labor. Our results are unique to Reddit, but they may lend methodological and conceptual insights into our understanding of parenting in other sites, such as Facebook Groups. In future work, we would like to further explore how to promote gender equity, and specifically father involvement, in online platforms. This work seeks to place fathers as a central demographic in the design of online parenting platforms. In so doing, we hope to advocate for increased gender equality between mothers and fathers.

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