Food parenting topics in social media posts: Development of a coding system, examination of frequency of food parenting concepts, and comparison across Reddit and Facebook

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ABSTRACT

This study presents development of a coding system to examine food parenting topics presented in posts on social media, and compared topics between two social media platforms (Facebook, Reddit). Publicly available social media posts were gathered from Facebook (2 groups) and Reddit (3 subreddits) and a coding system was developed based on the concept map of food parenting proposed by Vaughn et al. (2016). Based on the developed coding system, we coded posts into overarching food parenting practice constructs (coercive control: attempts to dominate, pressure or impose parents' will on child, structure: organization of child's environment to facilitate competence, autonomy support: supporting child's ability to self-regulate through allowing food choices, conversations about food, and a positive emotional climate) and recipes. We also coded posts dichotomously as including a question or advice-seeking. Differences in frequencies of food parenting constructs presented in posts on Facebook and Reddit were considered using chi-square tests of independence. Of the 2459 posts coded, 900 were related to food parenting (37%). In the subsample of 900, posts related to structure (43%) and recipes (40%) were the most frequent. Close to half of the posts (44%) included questions about food parenting. Frequency of food parenting topics in posts was related to social media platform, with coercive control and structure more frequently discussed on Reddit and recipes more commonly posted on Facebook. Results suggest that food parenting topics discuss on social media differ by platform, which can aid researchers and practitioners in targeting social media-based outreach to the topics of most interest for users. Findings give insight into the everyday food parenting topics and questions that parents and caregivers may be exposed to on social media.
Taxonomy: Development of Feeding; Parenting; Online Information Services.

Introduction

Childhood obesity remains a key public health issue of the twenty-first century (Hales et al., 2018; World Health Organization, 2012), in addition to issues of poor dietary intake among children (World Health Organization, 2014). Food parenting practices are important predictors of child diet (Ventura & Birch, 2008), and set the stage for children's development of healthy eating habits. In particular, research suggests that responsive food parenting practices (i.e., practices that respond to the child's feelings and needs, allowing them to increasingly become independent in their eating decisions) that provide structure or autonomy support are positively associated with healthy child diet, while use of non-responsive practices (i.e., those that rely on control and impose the parents' will on the child) are generally associated with unhealthy eating and adiposity (Vaughn et al., 2016).

Parenting practices are shaped by many factors, including sources of information (Abidin, 1992; Belsky, 1984). To support parents in utilizing responsive food parenting practices, easily accessible information

that provides straightforward advice for feeding young children and addressing feeding challenges is critical. Clinicians and other health professionals provide an important source of evidence-based guidance for parents related to child health, especially early on when parents are learning to use responsive practices (Eneli et al., 2007). However, regular contact with health care professionals becomes much less frequent after the child's first year of life (Carruth & Skinner, 2001). During this same developmental period, research indicates that parents may be more willing to trust the advice of others going through a similar experience. For example, previous research has found that parents are more willing to trust the advice of other parents related to deciding when and how to introduce complimentary foods (i.e., foods other than breastmilk or infant formula) (Baughcum et al., 1998; Walsh et al., 2015). The period after the first year also marks the formative years for development of healthy eating habits as children transition to eating solid foods and begin developing autonomous dietary behaviors (e.g., choosing what they eat, feeding themselves). Thus, this is a key developmental period to ensure that parents are receiving evidence-based information and support for responsive feeding practices (Savage et al., 2007).

With the rise of digital technology (Lazer et al., 2009), seeking health and parenting information online has become more and more popular (Fox & Duggan, 2013; Nellsch et al., 2013a). Parents from across demographic backgrounds are seeking information in relation to topics ranging from breastfeeding to pediatric skin cancer online (Ammari et al., 2018; Asiodu et al., 2015; Baker et al., 2017a; Nellsch et al., 2013a). Research indicates parents like using online information sources for anonymity and convenience (Doty & Dworkin, 2014; Dworkin et al., 2018), and this is particularly true for parents who are geographically isolated (Dworkin et al., 2015).

Social media has become a prominent place for parents to seek parenting advice, share parenting experiences, and gain social support (Duggan et al., 2015; Duggan et al., 2015; Dworkin et al., 2018; Price et al., 2017). Health and parenting information on social media are easily accessible to parents by either posting their own question or reading through a thread of comments contributed by other users. These online sources may be useful, efficient ways for parents to gain information and advice related to their food parenting practices. However, due to the diversity and potential inaccuracy of information online, professionals are increasingly concerned about the potential spread of information via social media that is contrary to professional recommendations (Baughcum et al., 1998).

Given the crucial role of information in shaping parental feeding practices (Abidin, 1992; Belsky, 1984), understanding how the topics of information presented about feeding on social media fall into categories of responsive or non-responsive practices represents an important area of study (Doub et al., 2016a; Pretorius et al., 2019; Price et al., 2017). In recent research considering parents questions, comments, and posts in a private Facebook group related to infant care, researchers found that parenting related to food (such as decisions about when to introduce solids) was a prevalent topic of interest (Kallem et al., 2018). Likewise, surveys with parents of three year old children indicate around half of mothers use the internet to find information about feeding their child (Laws et al., 2019). Because parents are increasingly turning to social media for advice (Doty & Dworkin, 2014; Dworkin et al., 2018), in recent years, experts in the food parenting field have suggested a need for research examining social media and parents' food parenting attitudes and practices (Doub et al., 2016a). The research on food parenting information naturally occurring on social media and the dynamics of feeding discussions across different social media platforms has been limited. Some studies have considered posts on social media related to breastfeeding (Bridges et al., 2018; Yamada et al., 2018). However, few have considered topics related to child feeding after solids are introduced. One study examined blog posts for mothers of preschool-aged children for food parenting topics, and found many posts focused on children's food preferences, involving children in food preparation, and

recipes (Doub et al., 2016c). However, blogs may not present the same type of information as other social media platforms used currently.

If parents are using information on social media to inform their feeding practices, it is important to understand the extent to which the feeding practices being presented on social media encourage responsive food parenting. Therefore, the current research seeks to provide insights into the nature of food parenting practices (i.e., coercive control, structure, and autonomy support) being discussed on two popular social media platforms among parent users: Facebook and Reddit. The novel examination of food parenting through the context of social media has benefits, including the ability to study food parenting practices on a large scale across various topics, users, and time points. For example, social media data can provide a window into current and prevalent attitudes and beliefs about feeding as well as the topics parents may find challenging and are seeking advice about online. Social media can provide information beyond what is traditionally captured in research using surveys (Teague & Shatte, 2018), which often ask parents to reflect on their average practices (e.g., "How much do you keep track of the sweets that your child eats?") (Birch et al., 2001). Furthermore, the use of social media data could help researchers reduce the possibility of social desirability bias in parents' reports of their own practices, providing insights into natural issues in food parenting and potentially allowing for timely intervention recommendations. This information can provide a basis for future efforts focusing on social media-based parental outreach.

The current research will focus on two social media platforms that host a large and growing number of parenting communities: Facebook and Reddit (Ammari et al., 2018; Bartholomew et al., 2012; Ammari & Schoenebeck, 2015). These two platforms allow parents to share and engage in in-depth discussions by posting various forms of content (e.g., text, pictures, videos) with generous post length limits (Fox & Duggan, 2013, pp. 1–55; Duggan et al., 2015). Each social media platform, with its unique characteristics, may allow parents to seek and discuss different types of information. For example, research has shown that parents participate in Facebook groups to share personal experiences, ask questions, and seek support from other parents, particularly for those that have children with special needs or health-related issues (Ammari & Schoenebeck, 2015; Thoren et al., 2013). However, the reveal of personal identity and privacy concerns on Facebook might make parents hesitant to disclose personal information, and at the same time, feel pressured to maintain a socially desirable self-presentation by only sharing positive information (Debatin et al., 2009). Reddit, on the other hand, allows users to remain anonymous, thus, enabling parents to more naturally discuss their beliefs and practices that they may not feel comfortable disclosing on other sites (Ammari et al., 2018). For these reasons, comparing the types of food parenting information being discussed on Facebook and Reddit can provide valuable insights into how parents' discussion of child feeding differs by the characteristics and expectations of the social media platform they engage in.

Research objectives

The objectives of the current research were to **1)** adapt previously used constructs of food parenting to code information in social media posts, **2)** examine types of food parenting being presented on social media and **3)** compare differences in topics presented across social media platforms (Facebook, Reddit), given potential differences in users of these platforms as well as their different intended uses. Addressing these research objectives will provide a basis of knowledge related to the types of food parenting information presented on social media as well as a foundation of hand-coded data that can build towards automated coding processes to examine child feeding topics on a much larger scale.

Table 1

Food parenting practice higher-order construct first-level codes, definitions (O'Connor et al., 2017; Vaughn et al., 2016), specific practice second-level codes, and example social media posts.

First-level Codes	Definition	Second-level codes	Example social media post excerpts
Coercive Control	Parent's pressure, intrusiveness, and dominance in relation to children's feelings and thoughts, as well as their behavior	- Restriction for weight - Using food to control negative emotions - Threats & bribes - Pressure to eat - Intrusive control	"I feel Like **I am having to force him to eat anything at any given time**, except fruit. Anybody else go through this? Is this some sort of phase he is going through?" " … I have tried Mommit ….I have tried just about everything; **bribing, threatening**, putting it out for breakfast, and sending them to bed hungry. You know what? they don't care … !"
Structure	Parent's organization of children's environment to facilitate children's competence	- Prompt to eat - Rules & limits - Permissive feeding - Food accessibility/availability - Food preparation - Modeling - Exposure to variety/selection - Meal routines - Redirection & negotiation	" … for the last few months I've noticed that he will eat better if I **let him walk around while he eats** … **I've always believed in eating at table** I love it I was raised that way but sometimes I don't make him because I really want him to eat a good amount!"
Autonomy Support	Promoting psychological autonomy and encouragement of independence	- Child involvement - Encourage healthy eating - Education/reasoning	"I wanted to get my daughter a knife so she can **start helping me prep food for meal times** as she wants to be involved more. Can you recommend a plastic kid safe option?" " … He helped strip the thyme leaves, peel the mushrooms and measure the cheese … We sat down to eat and without a word ate his first mouthful and excitedly exclaimed "Delicious!" This was the most positive dinner in a long time, **purely because he helped**!"
Recipes	Posts including a distinct recipe, list of ingredients, and/or cooking instructions	- Fruit-based recipe - Vegetable-based recipe - Protein-based recipe - Grain-based recipe - Mixed dish - Multiple recipes	"My LO loved these and they were a great second-day sandwich for me! 1 l b ground meat, either 1/2 or 1/4 diced onion, 2 cloves of garlic, 1 or 2 crumbled slices of bread, pinch of salt, 2 splashes of sauce, sprinkling of mustard powder, squirts of ketchup, couple tablespoons of tomato paste, some mixed herbs, small dash of pepper"

Methods

Objective 1: coding development for food parenting on social media

To address the first study objective, we used a modified version of a thematic content analysis process (Braun & Clarke, 2006). Content analysis generally includes steps: 1) selecting the unit of analysis, 2) creating and defining the categories, 3) pretesting the category definitions and rules, 4) assessing reliability and validity, 5) revising the coding rules if necessary, 6) pretesting the revised category scheme, 7) coding all the data, and 8) reassessing reliability and validity (Downe-Wamboldt, 1992). In a modified version of this process, we utilized an already existing concept map of food parenting (Vaughn et al., 2016) as a basis for step 2) creating and defining the categories. This concept map includes three categories of food parenting (coercive control, structure, and autonomy support; definitions and examples provided in Table 1) which were determined by content experts in the field to represent overarching, higher-order food parenting practice constructs (O'Connor et al., 2017; Vaughn et al., 2016). These constructs have been linked with children's dietary intake and obesity risk (Vereecken et al., 2010). Within these three larger constructs, the concept map also identifies more specific food parenting practice subconstructs that represent more specific behaviors. The three overarching categories and more specific food parenting practice subconstructs were used as the initial content analysis coding scheme, moving into step 3) pretesting category definitions and rules. The three overarching constructs served as a first-level code of the overarching food parenting practice identified in each social media post, and the subconstruct behaviors were used to assign a second-level code. Thus, each social media post would be given a first-level code (i.e., coercive control) and a second-level code (i.e., threats and bribes).

To guide coding using this concept map, definitions of the first-level, higher-order constructs were drawn from Vaughn and colleagues (Vaughn et al., 2016). Definitions are presented in Table 1. For second-level codes of specific food parenting practice subconstructs, parent-report survey items from already existing, validated questionnaires of food parenting used to develop the concept map were used as a guide (O'Connor et al., 2017). For example, survey items such as "I beg my child to eat [/at least something from his/her plate]" and "I insist/force my child to "try one bite" or taste a [food/healthy food]" helped to guide the definition and identification of the Pressure to Eat subconstruct of Coercive Control.

The majority of the content analysis coding development (steps 1–5) was completed by the first and second authors, who have experience and expertise in food parenting and social media/advertising, respectively. The process of creating the coding manual was overseen by the last author, a content expert in family mealtimes, food parenting, and childhood obesity, who contributed to the creation of an item bank of food parenting practice survey items that was referenced in the creation of the coding manual (O'Connor et al., 2017). This process took place over approximately 5 months, including 12 rounds of reviewing, coding posts, discussion, and.

Revising the coding manual. After the coding system was established, social media posts were coded by a team of four coders (including first two authors, and two research assistants), including steps 6–8 in which the coding team tested the finalized categories created by the first two authors, coded all the data, and calculated reliability.

Objective 2: collection of public social media posts

A set of public Facebook and Reddit posts (i.e., publicly posted text within a social media platform) were retrieved via the Facebook Graph API (https://developers.facebook.com/docs/graph-api/) and the historical store of Reddit posts (https://pushshift.io/api-parameters/). Specifically, subgroups from Facebook and Reddit were chosen including three subreddits (a forum or group within Reddit dedicated to a specific topic or theme) and two public Facebook groups (specific group created around a specific topic, organization or business which users can join or follow, and post to the groups' wall or main message board). These groups were selected because they were aimed at parents and caregivers, focus on parenting topics, including topics related to child feeding, and have a large number of subscribers (at least 1000) and regular engagement from users (daily posting). The first author generated a list of potential Facebook groups and subreddits based on these criteria. Then, the first and second authors reviewed and selected potential Facebook groups and subreddits and presented this information to the last author and trained coders. The research team collectively selected groups whose focus fit the aims of the study. Originally approximately 1500 posts were randomly selected each from Facebook and Reddit, but not all posts were included in the final coded data set due to exclusion criteria (i.e., no posts only including videos or photos were coded, posts were filtered based on criteria for those drawn from general parenting groups). The percentage of the total randomly selected posts included from each group (subreddit or public Facebook group) was determined in relation to the number of users in each group and posts available in all the historical data. For Facebook, posts that had a privacy setting of "public" from two popular nutrition and feeding groups (groups with 20,657 followers, and 41,064 followers) were accessed in May 2018. The descriptions of these two groups stated that they aimed to provide advice and share tips and recipes to help parents make healthy nutrition choices and impact their child's eating habits. The final Facebook data set includes randomly selected first-level posts with text (e.g., status) selected from the larger available data set of all public posts from these groups. These randomly selected posts were originally created between February 2015 to May 2018 (n = 1391 posts). No comments on posts or posts that solely included photos or videos were assessed in the current research due to differences in coding methods necessary for photo or video media as compared to text-based.

For Reddit, posts from three fully public subreddits related to parenting, nutrition, or feeding (subreddits included 610,416 subscribers, 1075 subscribers, and 60,554 subscribers) were accessed in February 2018. The Reddit data set includes randomly selected first-level posts from the larger data set of public posts, which were available from October 2010 to June 2017. Posts were randomly drawn from these data sets. For the Reddit posts, we further filtered the data because many topics associated with parenting were present. Posts were filtered based on food/parenting/nutrition key words including: "food, feed, eat, diet, snack, meal, dinner, breakfast, weight, restaurant, serving, portion, fruit, vegetables, hungry, sweets, dessert, nutrition, nutritious" to select posts relevant for the final data set (n = 1068 posts).

Only public posts were collected, with no identifying information from users. The research protocol was reviewed by the Office for the Protection of Research Subjects at the authors' university, and deemed exempt from Institutional Review Board review as it did not meet the definition of human subjects research. The protocol was also reviewed by a University Copyright Librarian and deemed appropriate in terms of ethics and privacy protection.

Data analyses

Social media posts were coded in Microsoft Excel and codes were assigned using a number system. All posts were coded by one of the four trained coders. A subset of posts (45%) were double-coded to prevent coding drift and ensure reliability during the coding process (coding reliability is described in more detail below). For posts coded by more than one person, coder agreement was calculated as Cohen's kappa to ensure inter-rater reliability (Viera & Garrett, 2005). Kappa above 0.70 was chosen as a reliable metric for inter-rater reliability based on previous research and consideration of 0.60 as moderate agreement and 0.80 as substantial agreement (Viera & Garrett, 2005; Doub et al., 2016d). These data were imported into SPSS version 25 (Corp., 2015) and the frequency of codes was calculated. To consider whether the

frequency of food parenting topics was associated with social media platform (Facebook and Reddit), Chi-square tests of independence were examined with Bonferroni adjusted post-hoc comparisons (Dayton & Schafer, 1973). We used Chi-square tests of independence or Fischer's exact tests (as appropriate, based on expected cell counts) to compare differences in the frequency of posts coded as questions or advice-seeking across food parenting topic categories (e.g., control versus autonomy support) and within food parenting topic categories (e. g., structure-prompt to eat versus structure-rules and limits).

Results

Objective 1: coding development for food parenting on social media

In reference to the first study objective, the concept map proposed by Vaughn and colleagues (Vaughn et al., 2016) was used as a starting point to develop a coding system (see Table 1) to capture aspects of food parenting. An item bank of survey instruments related to food parenting practices (O'Connor et al., 2017) was also referenced in developing the coding manual. While working through steps 3–5 of the content analysis process as the first two authors were reviewing posts and applying the concept map, it became clear that food recipes for children were a common topic. These posts were considered to be qualitatively different than posts discussing food preparation under the structure category (e. g., "Always best to chop grapes in half (length ways) to avoid choking"). As such, a fourth category of food recipes was added based on initial coding. Recipe posts were also coded with a second-level code, based on the type of food included in the recipe or as a mixed dish for recipes including multiple foods. Considering recipes as a category is also consistent with previous child feeding blog research, which found recipes were included in 66% of blog posts (Doub et al., 2016c). Through an iterative process in which the first and second author would read groups of posts from Reddit and Facebook, attempt to apply codes, make notes, and meet to review, it was determined that the three domains of food parenting proposed by Vaughn and colleagues could be used to successfully categorize all food parenting related posts with any other posts falling under the code of recipes. Posts that did not relate to food parenting or recipes were coded as unrelated and not considered further.

The coding manual was refined to better accommodate coding of social media data through a process of adding additional notes and example posts. As part of this process, the first and second author added clarifying notes to the developed coding manual to help discern which codes should be applied. For example, to help distinguish between posts that should be coded as "Control-pressure to eat" and "Structure-prompt to eat" a note was added to the coding manual such that control should be coded when the post indicates forcing the child to eat using controlling methods (i.e., must eat food before leaving the table, physically forcing to eat) while structure related to prompting the child should be coded when the parent indicates asking or suggesting the child should eat a certain food. An example was provided in this note to further help distinguish between these two codes, indicating that posts related to prompting to eat are often questions or advice seeking in which the poster is asking how to get their child to eat certain things (i.e., more vegetables) versus posts encompassing pressuring the child to eat which might include the parent indicating they are continually giving their child the same food over and over and telling them they must eat the food before they leave the dinner table. Notes and clarification such as these were added to the coding manual throughout the coding process.

Based on discussion between the first two authors and review by the last author during the coding manual development it was also determined that two additional aspects of posts should be coded. First, it became clear early in reviewing the data that many posts were questions or posts in which parents were seeking advice related to specific feeding topics. As such, it was decided that a dichotomous (yes/no) code should be applied to each post to indicate whether the post included a question or advice-seeking. Second, some particularly long posts (e.g., 12 lines of

Table 2
Frequency of food parenting codes across social media platforms.

	Total (N = 900)	Facebook (n = 547)	Reddit (n = 353)
Control	62 (7%)	9[a] (2%)	53[b] (15%)
Restriction for weight	2 (3%)	0 (0%)	2 (4%)
Using food to control negative emotions	7 (11%)	1 (11%)	6 (11%)
Threats & bribes	7 (11%)	3 (33%)	4 (8%)
Pressure to eat	12 (19%)	1 (11%)	11 (21%)
Intrusive control	34 (55%)	4 (44%)	30 (57%)
Structure	390 (43%)	153[a] (28%)	237[b] (67%)
Prompt to eat	36 (9%)	10 (6%)	26 (11%)
Rules & limits	16 (4%)	7 (5%)	9 (4%)
Permissive feeding	18 (5%)	1 (1%)	17 (7%)
Food accessibility/availability	107 (27%)	38 (25%)	69 (29%)
Food preparation	105 (27%)	39 (25%)	66 (28%)
Modeling	3 (1%)	2 (1%)	1 (1%)
Exposure to variety/selection	71 (18%)	43 (28%)	28 (12%)
Meal routines	33 (8%)	13 (8%)	20 (8%)
Redirection & negotiation	1 (1%)	1 (1%)	0 (0%)
Autonomy Support	92 (10%)	59[a] (11%)	33[a] (9%)
Child involvement	53 (58%)	27 (46%)	26 (79%)
Encourage healthy eating	22 (24%)	17 (29%)	5 (15%)
Education/reasoning	17 (18%)	15 (25%)	2 (6%)
Recipes	356 (40%)	326[a] (60%)	30[b] (8%)
Fruit-based recipe	32 (9%)	32 (10%)	0 (0%)
Vegetable-based recipe	69 (19%)	67 (21%)	2 (7%)
Protein-based recipe	18 (5%)	17 (5%)	1 (3%)
Grain-based recipe	36 (10%)	33 (10%)	3 (10%)
Mixed dish	81 (23%)	70 (21%)	11 (37%)
Multiple recipes in one post	115 (32%)	103 (32%)	12 (40%)
Question/advice seeking	397, 44%	102[a], 16%	295[b], 84%

Notes.

Data represent frequency of posts, with percentages of posts within each category in parentheses.

Percentages were calculated based on total number of food parenting posts for first-level codes (control, structure, autonomy support, recipes, questions, multiple topics) and number of posts within categories for second-level codes (e. g., restriction for weight within Control).

In second and third column, differing letter superscripts ([a, b]) indicate significant differences in proportions of each food parenting category with post-hoc tests at the $P < .05$ level.

text with a list of questions) included secondary topics. For the initial development of the coding manual and research objectives addressed in the current paper, it was decided that only one first-level code would be assigned per post. Coders were able to determine the most prevalent topic in each post and assign one first-level code. However, for longer posts in which more than one topic was mentioned, a dichotomous (yes/no) code was also applied to indicate whether the post contained multiple topics or not such that these posts could be further examined in future research.

Coding reliability. A total of 375 posts (15% of all posts) were randomly selected and coded by all four members of the coding team, with periodic check-in meetings and review. Once inter-rater reliability exceeded Cohen's kappa >0.70, coders began coding posts individually. Throughout the rest of the coding process a randomly selected 693 additional posts were double-coded (30% of posts; total of 45% of all posts were double-coded) to maintain coding accuracy and prevent against coder drift. Reliability was calculated to ensure maintenance above Cohen's kappa >0.70. Any disagreements between coders were discussed and final codes determined based on agreement across the coding team.

Objective 2: frequency of food parenting topics

A total of 2459 posts were coded, drawn from 3 subreddits (1068 posts; divided across the subreddits with 35%, 61%, and 4% from each) and 2 public Facebook groups (1391 posts; 59% from one group and 41% from the other). Of the total coded posts, 900 were related to food

Table 3
Frequency of Questions or Advice-Seeking across Posts included Food Parenting Topics.

	Question/Advice-Seeking	
	Yes	No
Control[1]	47 (77%)	14 (23%)
Restriction for weight[a,b]	2 (100%)	0 (0)
Using food to control negative emotions[a,b]	4 (57%)	3 (43%)
Threats & bribes[b]	3 (43%)	4 (57%)
Pressure to eat[a]	12 (100%)	0 (0)
Intrusive control[a,b]	26 (79%)	7 (21%)
Structure[1]	281 (77%)	84 (23%)
Prompt to eat	24 (67%)	12 (33%)
Rules & limits	11 (69%)	5 (31%)
Permissive feeding	16 (89%)	2 (11%)
Food accessibility/availability	87 (85%)	15 (15%)
Food preparation	69 (73%)	25 (27%)
Modeling	1 (23%))	2 (67%)
Exposure to variety/selection	55 (85%)	10 (15%)
Meal routines	18 (60%)	12 (40%)
Redirection & negotiation	0 (0)	1 (100%)
Autonomy Support[2]	34 (41%)	48 (59%)
Child involvement	24 (47%)	27 (53%)
Encourage healthy eating	4 (29%)	10 (71%)
Education/reasoning	6 (35%)	11 (65%)
Recipes[3]	21 (21%)	81 (79%)
Fruit-based recipe[a,b]	0 (0)	11 (100%)
Vegetable-based recipe[a,b,c,d]	1 (8%)	12 (92%)
Protein-based recipe[a,b,c,d]	1 (33%)	2 (67%)
Grain-based recipe[b,d]	4 (44%)	5 (66%)
Mixed dish[a]	3 (7%)	40 (93%)
Multiple recipes in one post[c,d]	12 (52%)	11 (48%)

Notes.

Data represent frequency of posts, with percentages of posts in parentheses. Percentages were calculated based on the total number of posts in each category (and sub-category) that were or were not questions/advice seeking.

Differing number superscript ([1, 2, 3]) indicate significant differences in proportions of question/advice seeking between categories.

Differing letter superscripts ([a, b, c]) indicate significant differences within the Control and Recipe categories with post-hoc tests at the $P < .05$ level.

parenting or recipes (37%). The percentage of posts coded from each group or subreddit were commensurate with their number of users and total posts available. Qualitatively, the data included a richness of topics being discussed with respect to food parenting practices (see Table 2, first column). Posts across both social media platforms were most commonly related to food parenting structure (43%; e.g., "… We've recently started finger foods. He doesn't seem to like them much, but we're just going to keep presenting them to him and I'm sure we will get there") or recipes (40%). However, posts related to autonomy supporting practices (10%; e.g., "My child has always needed to be very close to me, so it was more out of desperation than any ideal that I got her involved in the kitchen. To my surprise, she is capable of WAY more than I ever thought at this age!") or use of controlling practices (7%; e.g. "Do you use food to keep your little one quiet, well behaved or to stop a tantrum?") were much less common (see Table 1 for additional examples). Approximately one third of coded posts (31%) mentioned more than one food parenting topic.

Close to half (44%) of posts included a question or indicated the poster was seeking advice related to a food parenting topic. The frequencies of posts including questions or advice-seeking differed by food parenting topic (χ^2 (3) = 130.50, $P < .001$; see Table 3). Post hoc tests indicated the percentage of posts coded as including topics of control and structure did not differ in the frequency of questions, with over three-quarters (77%) including questions for both topics. These percentages differed significantly from posts related to autonomy support and recipes, which had fewer questions or advice seeking (41% and 21%, respectively).

Within the second-level codes of specific food parenting practices, posts were often related to the foods that parents make accessible or

available to their child (27% of structure-related posts; e.g., "Hopefully this isn't a dumb question! I was just curious as to when I should stop giving her formula and feed her baby foods, diluted juices, regular milk ect … Just looking to see what other moms are doing or have done with their baby") and food preparation (27% of structure-related posts; e.g., "I started my 7 month old on solids last month, and even though I used store-bought purees for my first baby and have so far with my second as well, I thought it might be fun to make some myself. Have you made any homemade baby food purees? Did you find it advantageous and fun or more trouble than it's worth?"). Recipe posts often contained multiple recipes (32% of recipe posts) or some kind of mixed dish (23% of recipe posts), such as a pasta. Posts related to engaging in autonomy supporting food parenting practices most commonly included involving the child in food decisions or preparation (58% of autonomy support posts; e.g., "One thing I'm really interested in are recipes that are fun to make with toddlers. My daughter is (nearly) 2 years old and we've been cooking together for a while now. She can crack eggs, butter and loves to pour things. If you have any recipes that you've had fun cooking with toddlers I'd love to try them"). Posts about controlling food parenting were most commonly about use of intrusive control (55% of control posts; e.g., "… As I tried to coax, trick and force her to eat all of her bun of which she had only ingested a couple of bites, the truth, cold and hard, was staring me in the face: She simply does not like peanut butter").

Posts within each food parenting topic also differed in terms of the frequency of questions and advice-seeking (see Table 3). Within the control category (Fisher's Exact Test (FET) = 9.86; $P = .03$), posts coded as "pressure to eat" more frequently included questions (100%) than posts coded as "threats or bribes" (43%). Other posts related to control did not differ significantly. For posts related to structure and autonomy support, there were not significant differences in the frequency of questions or advice seeking within second-level codes. For posts coded as recipes (FET = 24.32, $P < .001$), posts including multiple recipes had the most questions (52%), significantly more than fruit-based or mixed dish recipe posts. Most other recipe posts included few questions (ranging from 0 to 44%) and did not differ significantly from one another.

Objective 3: differences by social media platform

A chi-square test of independence was used to examine whether the frequency of first-level coded topics in posts was associated with social media platform (Facebook, Reddit). Results indicated a significant association between social media platform and topic frequency (χ^2 (4) = 276.15, $P < .001$; see Table 2, second and third columns). Bonferonni post-hoc tests suggest differences in the frequency at which users post about controlling food parenting practices, practices related to structure, and differences in the amount of recipes posted across the two sites. Specifically, posts related to controlling food practices and structure around feeding.

Were more commonly coded in Reddit than Facebook, while posts including recipes were more commonly found on Facebook. Additionally, chi-square tests indicated the frequency of posts that included questions or advice-seeking (χ^2 (1) = 4.66, $P = .03$) and posts that contained multiple topics related to food parenting (χ^2 (1) = 267, $P < .001$) were also associated with social media platform. Posts asking questions or seeking advice were much more common on Reddit (84% of all posts, versus 16% on Facebook), and posts including multiple topics were also slightly more common on Reddit (36%) as compared to Facebook (28%).

Discussion

Findings from this study indicate food parenting topics are presented in a large number of posts across the Facebook and Reddit parenting communities examined in this study. More than one third of the posts we examined from targeted parenting and nutrition subgroups were related

to food parenting concepts. Through an iterative development process, the research team was able to utilize a concept map of food parenting constructs developed by experts in the field (Vaughn et al., 2016) to code social media posts. This coding development process also indicated recipes were common topics of posts about feeding young children and many posts were questions or included advice-seeking.

Utilizing the developed coding system, we found that responsive food parenting practices (structure, autonomy support) were far more common than non-responsive food parenting practices (coercive control) in the social media posts retrieved. Similar to research considering discussions of breastfeeding on social media, this study indicates users may find groups to be a source of useful knowledge that leads to an organically formed community of practice (Skelton et al., 2020). Further research is needed to understand why users may post about specific food parenting practices more frequently than others. It may be that parents choose to post specifically about responsive practices in an effort to create a positive online persona. It could also be that parents struggle to find examples of responsive food parenting that fit their unique family circumstances and needs, but online communities that include a range of perspectives may help users find posts that resonate with them.

Our findings suggest that parents on social media would be less likely to discuss and be exposed to feeding practices associated with unhealthy eating and adiposity among children than responsive practices. However, given the average occurrence of 7%, the possibility of parents encountering these undesirable practices is still possible. Especially, discussions on coercive control were more popular on the platform where parents could share information anonymously than in the platform where personal identity is usually revealed (i.e., 15% on Reddit vs. 2% on Facebook). Thus, it seems like when the pressure to maintain a positive self-presentation is lifted, parents are more likely to disclose and discuss undesirable parenting practices. It is important to note that the majority (77%) of these posts included questions or advice-seeking, suggesting that parents and caregivers are specifically going online to ask about whether and how they should use these types of practices. This calls for further attention to the ways users engage with the information they find in response to questions, and additional efforts to understand how health professionals can respond to these questions about food parenting practices online. The automated coding processes developed in our current research could contribute to the advancement of tools for examining desirable versus undesirable food parenting practices online.

The majority of the social media posts examined were related to the structure parents create around food and mealtimes (such as the way meals are served), the preparation involved in making food that is both healthy and that children will readily eat, and sharing recipes to make for the family. These findings are similar to topics found in food blogs written by mothers of preschool aged children (Doub et al., 2016c) as well as survey research indicating ninety percent of mothers use the internet to search for recipes (Laws et al., 2019), and suggest a common, everyday concern for parents is making healthy foods available to their children and finding new recipes to use to do so. In line with this hypothesis, the majority of these posts included questions or advice-seeking. For researchers and practitioners hoping to promote positive, responsive food parenting and ultimately healthy eating, it is prudent to provide easy, affordable recipe suggestions along with other guidance related to responsive feeding practices to ensure parents have meal ideas in place that they can easily use when enacting practices that engage structure and autonomy support. Given that food accessibility, preparation, and recipes were the most common topics in posts, these are likely continually areas of concern for parents. Removing the stress of finding healthy meal ideas may help make space for parents to focus on other aspects of feeding.

In addition, posts were often questions seeking advice from other Facebook or Reddit users (44% of coded posts). This information is critical and suggests that individuals use social media as a place to seek information about feeding children. Further research is needed to better understand how general information posts and question-based threads

of comments on social media platforms align with best practice recommendations for feeding and child dietary guidance and how social media as a source of information is used in tandem with or in place of other sources (e.g., dieticians, pediatricians). In line with prior research (Kaufmann & Buckner, 2014; Nellsch et al., 2013a), social media may be a preferred source for seeking food parenting information because it is readily available to parents who are short on time and need a response to their questions quicker than could be provided by scheduling a doctor's appointment or getting in touch with a health professional. It will be important to understand how other sources of information are or are not able to meet these needs. In addition, research suggests parents more and more frequently turn to social media as a source of social support (Baker et al., 2017a; Bridges et al., 2018; Drentea & Moren-Cross, 2005; Haslam et al., 2017; Holtz et al., 2015; Jang & Dworkin, 2014; McDaniel et al., 2012; Swindle et al., 2018). This may also be the case for parents seeking advice about food parenting, who often end posts with a question such as "Does anyone else have this problem?", suggesting they are looking for support or validation from other parents who have faced similar issues.

Social media appears to be a naturally occurring way in which parents are seeking information for feeding their child. As such, health practitioners could utilize this medium to support parents. For example, a recent parent peer nutrition educator program in Australia found that parents had positive experiences receiving child feeding and nutrition information on social media from other parents who were trained as peer educators (Ball et al., 2017). Social media-based efforts to share general nutrition education information, such as the Food Hero campaign, have found success (Tobey & Manore, 2014). For example, one study found that the Food Hero social media marketing campaign was related to increased positive beliefs around fruits and vegetables (Tobey et al., 2016). Using a different approach, outreach efforts could focus on social media literacy for parents, to help them identify positive, evidence-based information related to responsive feeding and meal ideas while also gaining the social support social media may provide.

Results further indicated differences in the topics of food parenting and frequency of advice-seeking in posts across the two social media platforms, Facebook and Reddit. Since there is little prior research that directly compares Facebook and Reddit in terms of parenting information and social support exchange, our findings provide an initial consideration of differences in types of information shared across these two platforms. In line with previous knowledge about anonymity and information disclosure (Ammari et al., 2018), parents may be more comfortable disclosing and discussing information, especially in regard to their feeding practices, on Reddit than on Facebook. Even though parents still seek and share information on Facebook, they might feel the pressure to establish a desirable, positive self-presentation (Krämer & Winter 2008), and thus, are reluctant to share details of their parenting life on Facebook. Additionally, due to the setup of Facebook groups in comparison with subreddits, Facebook posts may be more likely to come from administrators of the group providing information to followers. This could be why fewer Facebook posts included questions. Our findings suggest that Reddit might be a more helpful platform for parents to open up and seek advice across a wide range of topics due to the anonymity and ability to post without being an administrator. Further research should help expand this understanding by examining information and support seeking from the parents' perspectives and providing a closer examination of who is posting information.

Based on these noted differences in Facebook and Reddit for sharing and discussing food parenting topics, outreach and social media campaigns could differentially direct efforts through these platforms. For example, Facebook may be a more appropriate place to provide parents with affordable, easy to make, and healthy recipes to try with their children, while Reddit may provide a better forum to address parents' questions around food parenting practices and encourage use of structure in mealtimes and autonomy support.

Limitations

The current study adds to a growing body of research describing social media as a source of information and support around topics of food parenting, contributing an innovative perspective on the topics discussed across Facebook and Reddit platforms. However, there are certain limitations and areas for further research that should be noted. First, the analyses presented here are limited to only a few subreddits and public Facebook groups focused specifically on parenting and may not represent the full range of food parenting topics presented across these two platforms. While the current analyses provide an initial consideration of differences across these two platforms, additional research is needed with a larger sample of posts to fully understand platform-based differences in food parenting topics. Additionally, future research should consider differences in posts within social media platforms by groups or subreddits, given that different groups may have different cultures related to parenting information sharing. To better understand differences across the two platforms, future research should also consider differences in posts on Facebook versus Reddit by the same individual. Understanding whether parents turn to different platforms for different types of information, or if individuals prefer one platform for all their interactions, will be essential to better target outreach efforts.

Second, these analyses were only conducted with publicly available, text-based posts and it is possible different topics are discussed in private social media groups. However, research suggests the anonymity created by public forums such as Reddit in which users can post under pseudonyms is an opportune place to examine information sharing and discussion as individuals may not feel as inhibited as in a private group where they are known by other members (Ammari et al., 2018). Further research is needed to better understand how parents and caregivers use the two platforms in relation to anonymity and social desirability. In addition, considering posts that include photos or videos may provide additional information related to food parenting presented on social media, as these posts could include references to how food is served such as pictures of mealtime.

Third, in these analyses we have no information about who is posting (no identifying information was captured when social media data were pulled, only post content) and as such cannot consider factors of the individual related to food parenting discussion. We do not know if the same user posted information multiple times or across platforms, or whether posts came from parents or other users such as subreddit or group administrators. This will be an important area for future research to better understand the information being provided to parents by social media administrators versus topics/questions parents are posing. In addition, previous research notes differences in online information-seeking behaviors related to demographics (Dworkin et al., 2015). Increasing understanding of demographic and socio-political differences in individual posters can help to inform the use of social media outreach efforts to targeted, at-risk populations. Specifically in reference to food parenting practices, it will be important to capture information related to child age in future studies given noted differences in the appropriate use of different practices by child age as well as differences in caregivers' role in feeding (i.e., primarily in charge of feeding responsibilities). Finally, it is worth noting that the current analyses only applied one food parenting topic code to each post and only examined first-level posts as opposed to comment threads. Future research will need to consider the multiple topics of food parenting discussed in posts and in the back and forth between users in comment threads.

Conclusions

Overall, findings from this study indicate posts on social media related to food parenting practices most often include topics related to structure in feeding and recipes. Post topics differed across Facebook and Reddit, and in relation to questions or advice-seeking. These initial findings provide a basis for future research questions related to feeding information on social media, such as a more specific focus on feeding topics or milestones (e.g., how to first transition infants to solid foods, managing picky eating behaviors) that are known to be challenging for parents. Leveraging publicly available social media data to better understand food parenting discussions can give insight into the everyday topics and questions that come up for parents as well as provide a large-scale look at food parenting challenges beyond what has been evaluated in prior research with surveys or direct observations that are subject to social desirability bias. Specifically, interdisciplinary collaborations with computer scientists using machine learning methodologies will allow us to build upon the hand-coded data presented in this study to examine food parenting topics using big data approaches (De Choudhury et al., 2016).

Future research should also compare topics discussed in posts to best practice guidelines to ensure information being shared is in line with evidence-based recommendations for feeding and children's dietary intake. For example, how do the many recipe posts shared compare to nutrition recommendations for children? Do users actually prepare the recipes they view in posts, and how do these impact the dietary quality of foods they are serving to their children? Most importantly, future research will need to consider how interactions and exposure to food parenting information on social media impacts parents' attitudes, beliefs, and practices in relation to child health outcomes. While there is no research specific to food parenting practices considering these associations, information related to general nutrition choices made by mothers indicates social media can shift beliefs and practices (Tobey et al., 2016).

The findings from this study also provide a necessary basis of knowledge for future social media campaigns focused on providing food parenting information. For example, social media infographics with recipes and information on how to provide healthy foods at mealtimes while incorporating child autonomy-promoting behaviors can be created. In addition, nutrition and health care professionals can use these results as a basis for discussing online information-seeking related to feeding with their patients. In the long-term, results can be used to develop comprehensive outreach and media literacy interventions that can be delivered online as well as in health care settings with the goal of supporting parents to evaluate information they seek out online. This study provides a basis for understanding the different types of food parenting topics and questions users post across social media platforms. Given the prevalence of food parenting topics and questions found on social media, individuals providing child feeding guidance should be energized to find ways to provide this information to caregivers in an efficient, supportive way (similar to what they find on social media) or support caregivers to use social media as a source of information in an informed way.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.appet.2021.105137.

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