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The Case of tienermoeders.nl

The Use of Forums and Blogs by Dutch Teen Mothers

WORKING PAPER #4

Introduction

Web and social media have reshaped how parents can face difficulties that arise during and after pregnancy (Lupton 2016). Not only these new technologies are used to gather information (Bankin 2016), but also as a way to find social and emotional support (Archer 2018).

This is particularly important for the vulnerable category of *teen mothers*; due to the social stigma (Boath 2013) they are left alone in facing common issues such as anxiety, stress and postpartum depression (Logsdon 2006) (Fahey 2013), in addition to be forced to drop out from school or leave work.

Social media has the opportunity to empower young mothers, facilitating the creation of communities, easing social interactions and, by providing anonymity (Schoenebeck 2013), allow them to share personal issues more freely (Archer 2018).

During the years, several scholars have studied how technology - with a particular focus on social networking and blogging - helps mothers during and after pregnancy (McDaniel 2012) (Gibson 2013) (Morris 2014) (Archer 2018) (Bankin 2016), but, to the best of our knowledge, little to none attention has been given to teen mothers.

For this reason, in this paper we study the particular case of the *tienermoeders.nl*, a Dutch website created for teen single mothers. Here, they can meet and discuss problems, issues and experiences.

The website is composed of three main sections.

- Information: this section contains several useful information about pregnancy, raising children and work. It also points to external contacts located in different cities or regions.
- Experiences: this section is divided into two parts, stories and blogs. In the first section, young mothers can submit and read personal stories. In the second, users can read blogs curated by former teen mothers.
- Professionals: this section is dedicated to people who wish to work with young mothers. They can be people who want to create teaching courses or workshops for young mothers, students who desire to study the teen motherhood phenomena, or, a journalist who wants to write an article about them.
- Forum: in this section both professionals and teen mothers can engage in discussions about various topics of interests.

In this paper we study on the Blog and Forum, as they are the two sections where mothers actively participate by either publishing stories, posting messaging and commenting; activities that previous works demonstrated being connected to mothers' well-being.

Our findings show Dutch teen mothers have a lot in common with the groups studied by the state of the art. While the website is used for asking advice, in both the forum and the blogs they express their desire for connection and belonging to a community. On the other hands, our network analysis on the forum highlighted a weak connection between the users, who doesn't seem engaged in discussions outside their own posts. We take our findings and elaborate suggestions for both policy makers and designers, ultimately proposing that the direct involvement of the teen mothers - in a co-design fashion - is greatly advisable.

Related works

Web technologies, such as fora, social networks and blogs, have the potential to empower people, by giving them tools to seek information and easily connect with people facing the same issues. Since the early age of social media (Madge 2006), scholars have been interested in studying how parents - and especially mothers - use Web platforms, to what end, and how they contribute to their well-being.

Gibson et al. (Gibson 2013) studied through an ethnography how technology can support new mothers. With focus groups and individual conversations, they found out mothers use technology to seek advice and connect with both other mothers and people outside their social circle. By doing this, they were able to boost their confidence as a mother and to maintain their previous identity - not becoming "just a mother".

Morris et al. (Morris 2014) focused on studying how mothers of young children use social media. They perform a survey, giving the mothers also the optional choice to sign-in with their social media account (e.g., Twitter and Facebook) to let the researcher download their tweets or Facebook posts. They found out Twitter is not used to share data about children due to either privacy issues - as you can't select who sees your status updates - or being more text oriented. On Facebook, they do not usually post more content about their children, but they use it to connect and socialise. Similar results were found by Parry et al. (Parry 2013), in the specific case of the Momstown.ca, a Canadian social network for mothers. In their interview mothers expressed their desire for connection with other mothers in similar situations.

Similarly, Archer et al. (Archer 2018) studied how social media can enhance mothers well-being. Through ten focus groups, they found out social media are used to get social support and to remain connected with friends and the world.

McDaniel et al. (McDaniel 2012), looked into how blogging impacts social support and reinforces social connections in young mothers. By interviewing 157 mothers, they found out blogging linked with a greater feeling of connection with family and friends and, as consequence, increase of social support.

Forum

The forum has different sections: *tienermoeders-gezocht* and *ik-doe-wel-mee* are dedicated to putting mothers and professionals or researchers in contact. In particular, the first is for professionals or researchers who are interested in performing interviews or asking teen mothers to fill out surveys and questionnaires, while in the second, teen mothers volunteer to participate in such activities.

In the *winactie* section users can post contests where it's possible to win different kinds of products. Specific sections are also dedicated to the trade and exchange of goods: *gevraagd* to ask for items, and *aangeboden* to offer or sell them.

The *zwanger* and *zwangerschap-en-bevallling* sections are used by young women and (expecting) mothers to ask questions about pregnancy and childbirth. *Jij-en-je-kind* is dedicated to discussion about being a mother and raising a child. Finally, *algemene-discussie* is for general discussions.

The *wat-jouw-behoefte-hulpverlening* section is for specifically asking and providing help and support.

There are also sections related to geographical areas: *noord-nederland*, for people living in Groningen, Drenthe and Friesland; *west-nederland* for users coming from Rotterdam and Delft areas; *oost-nederland* for people posting from Overijssel and Gelderland; *midden-nederland* for people living in Utrecht and Flevoland; and finally, *zuid-nederland* for individuals coming from Zeeland, Noord-Brabant and Limburg.

Reageren-blogs is used to comment on the stories published on the blog of the website. In *media-en-websites* people post links to external websites or other media that they consider useful for young mothers.

A small part of the forum is dedicated for fathers: *ben-ik* is where young fathers introduce themselves, and *financien* is dedicated to the discussions about finance.

Data Collection

We scraped the *tienermoeders.nl* forum retrieving all the posts and comments. We obtained 1007 posts and 2840 comments created by 460 distinct users. The time range considered goes from 18th January 2010 to 21st May 2019.

Forum	#post	#comment	Total
tienermoeders-gezocht	265	167	432
aangeboden	194	142	336
zwanger	129	458	587
gevraagd	64	131	195
algemene-discussie	51	270	321
jij-en-je-kind	49	476	525
zwangerschap-bevalling	53	546	599
zuid-nederland	42	126	168
west-nederland	33	129	162
noord-nederland	31	95	126
oost-nederland	20	82	102
midden-nederland	18	78	96
reageren-blogs	13	37	50
ik-doe-wel-mee	13	44	57
wat-jouw-behoefte-hulpverlening	10	21	31
ben-ik	5	8	13
winactie	3	5	8
financier	3	3	6
media	11	4	15

Table 6: distribution of posts and comments between the different forums

Table 6 shows the distribution of posts and comments among the different sections of the forum. The section with most posts in *tienermoeders-gezocht*, used to ask teen mothers questions, fill surveys or give interviews; but, if we consider the total activity, the most active forums are the ones related to pregnancy and children (e.g., *zwanger*, *zwangerschap-bevalling* and *jij-en-je-kind*). If we look at the forums related to a location, the most active are *zuid-nederland* and *west-nederland*. Notice also that *aangeboden* and *gevraagd*, sections dedicated to exchange and trade of goods shows a high number of posts and comments.

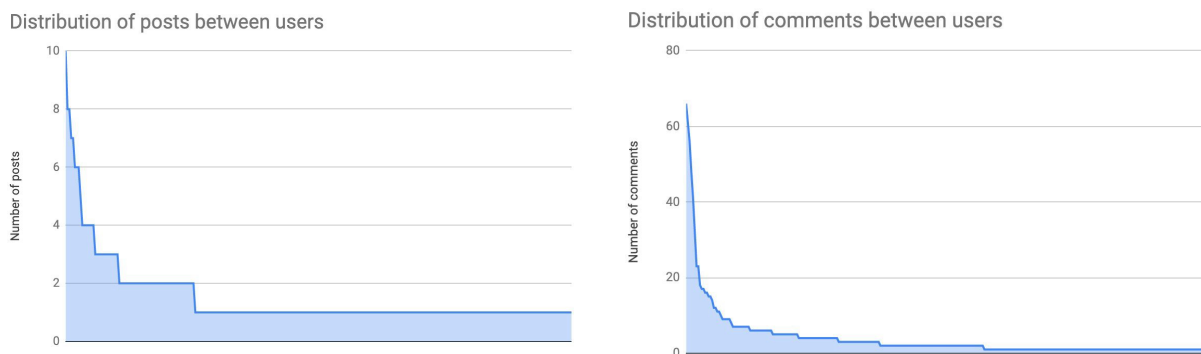


Figure 6: distribution of posts and comments between users

As shown by Figure 6, the numbers of both posts and comments follow a power law distribution, meaning that a small group of people is responsible for the majority of the social activity.

Moreover, it appears the majority of submissions were done by *Anonymous (niet meer actief)* user¹, probably this was before the forum made it mandatory to subscribe in order to create a new discussion.

Topic analysis

We performed topical analysis by computing multiple models and using the elbow method on the model's coherence to select the optimal topics number, obtaining 4 topics.

From topic analysis we can highlight four main topics of discussion:

- T0: Questions about pregnancy (moeten, dag, maand, week, pil, test, keer, menstruatie, vraag, geleden)
- T1: Mothers looking for friends (moeder, sturen, mama, bericht, vriend, contact, omgeving, tienermoeders, jaar, naam)
- T2: Personal experiences (kind, graag, vinden, mogen, horen, praten, ervaring, ding, net, staan)
- T3: Exchange of product (groet, maat, gebruiken, baby, meisje, dochter, kleding, kindergewagen, interesse, ophalen)

¹ This user is not included in the charts in Figure 6.

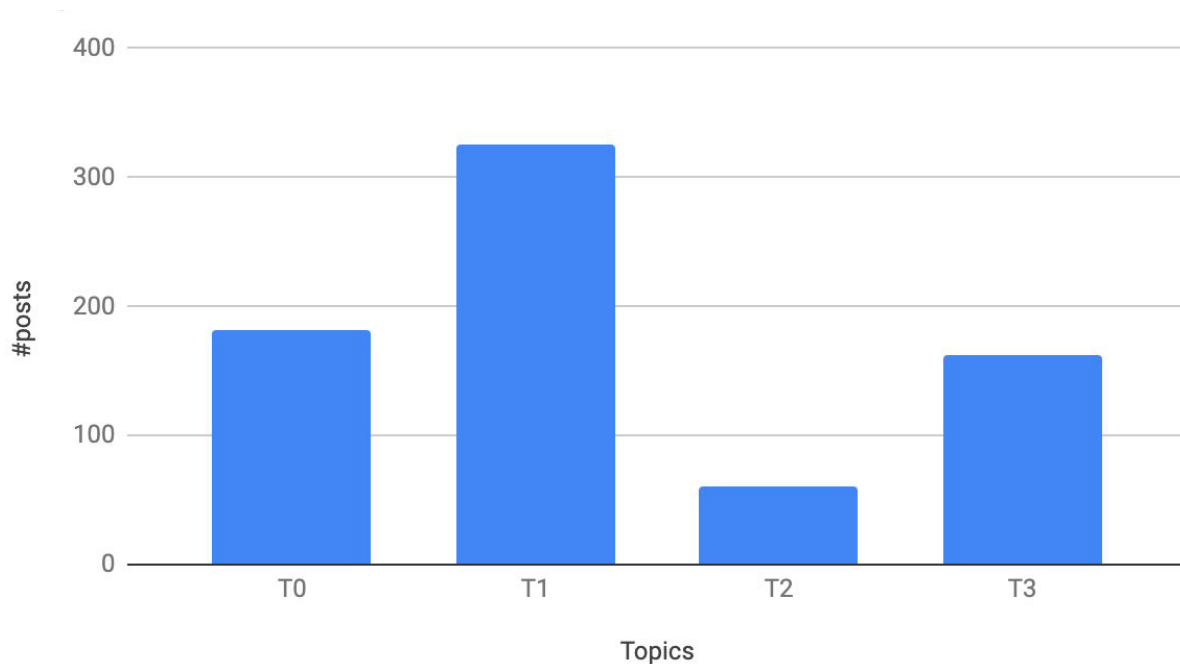


Figure 7: Overall distribution of topics in the posts

Figure 7 shows the overall distribution of topic of discussion in the posts in the forum. Interestingly, the most discussed topic is not about “Questions about pregnancy” (T0), but the one about “Mothers looking for friends” (T1), hinting that maybe this platform is used more to connect with others rather than asking questions. Also, the number of posts related to products exchange is big enough to make the topic emerge from the analysis.

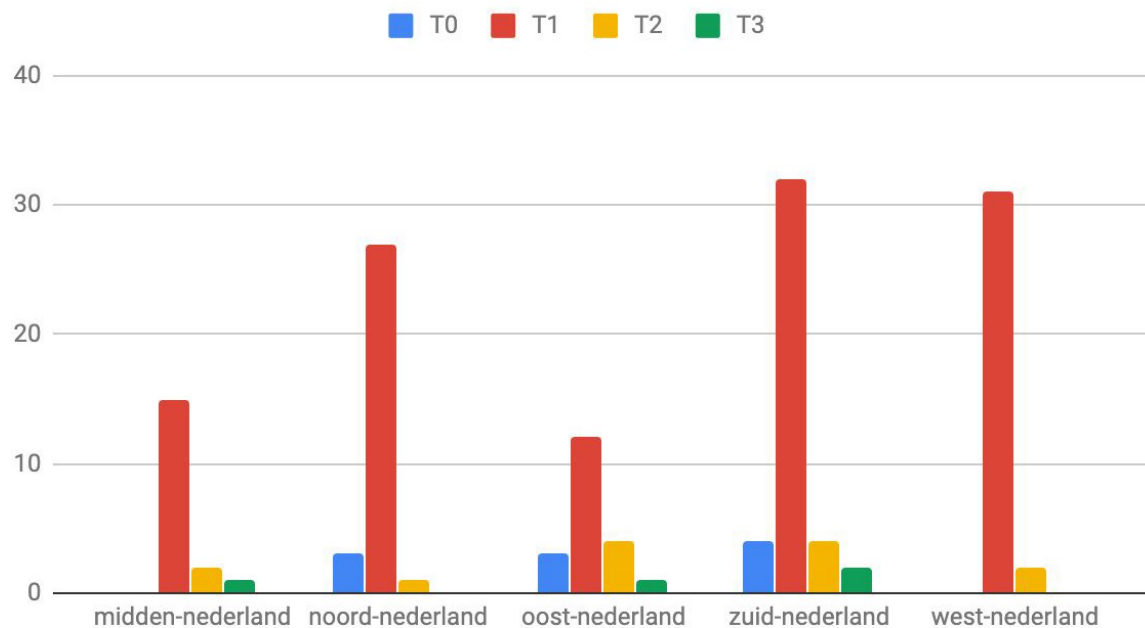


Figure 8: distribution of topics in the location based forums

This trend is even more evident if we look at the posts in the location-based forum (as shown in Figure 8).

Psycholinguistic analysis

The purpose of this analysis was to get insights on thoughts, feelings, personality, and motivations that drives the young mother using the websites.

To do so we used the Linguistic Inquiry and Word Count (LIWC) program (Pennebaker 2015), a text analysis tool that extracts emotions, thinking styles, social concerns, and parts of speech from a text by comparing the terms against a built-in dictionary.

LIWC compares terms appearing in a text against its dictionaries, and classifies each word in different categories. In this study we are interested in *drives*, an overarching category inspired by the work of McClelland (McClelland 1987) that includes the sub categories of achievement (i.e., references to success and failures, expressing the need to overcome difficult situations) , affiliation (i.e., references to others, expressing the need of belonging to a group), power (i.e., references to status, hierarchy, expressing the will to control others or their own goals), reward (i.e., references to rewards and incentives) and risk (i.e., references to dangers and things to avoid). *Social processes* refer to all the mentions to the social sphere of a person, here they are divided in *family*, *friends*, *male* and *female*. *Emotions* - as the name suggests - refers to the emotions expressed in the text divided in *positive* and *negative*; this is further classified as *anxiety*, *anger* and *sadness*. Finally, there is the category of *personal concern*, including work, leisure, home, money, religion and death. A word can belong to multiple categories (e.g., daughter counts both as family and female).

The final result is the percentage of words belonging to a category. So, for instance, if a text with 100 words has 4 terms related to emotions (e.g., 2 positives and 2 negatives), LIWC will return a percentage of 4% of the *emotion* category, divided into 2% positive and 2% negative. For the sake of this study, I'll report the distribution of the subcategories normalized to the count of the top one (e.g., considering the previous example, that corresponds to 50% positive and 50% negative).

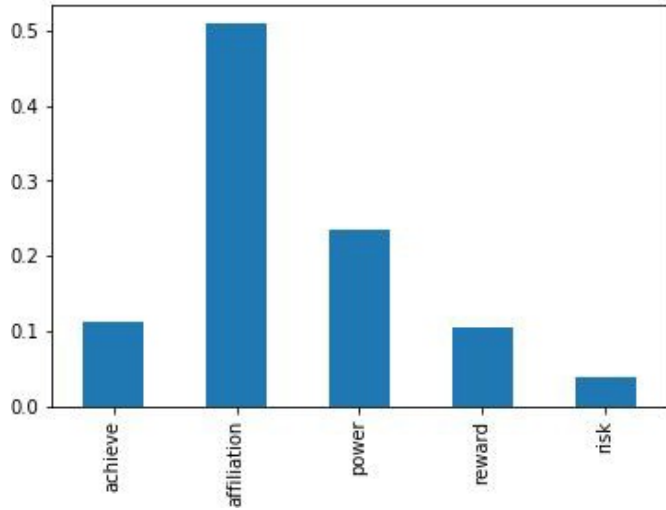


Figure 9: “drives” extracted by the LIWC tool

Figure 9 shows the distribution of motivations and goals that *drive* the young mothers posting on the website. Interestingly, the predominant drive is “affiliation”, meaning the users are expressing mainly a need for connection and bonding. This is coherent with the results of the previous topic analysis - as the predominant topic was about “looking for friends” - and the current state of the art.

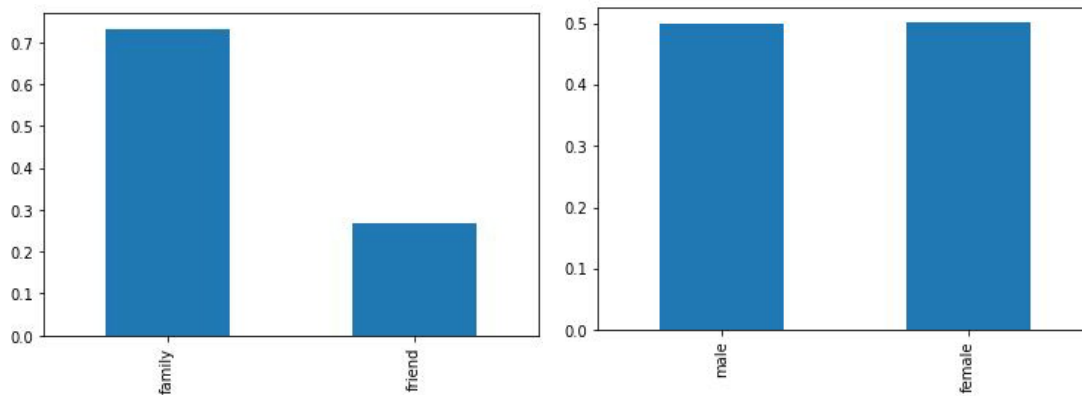
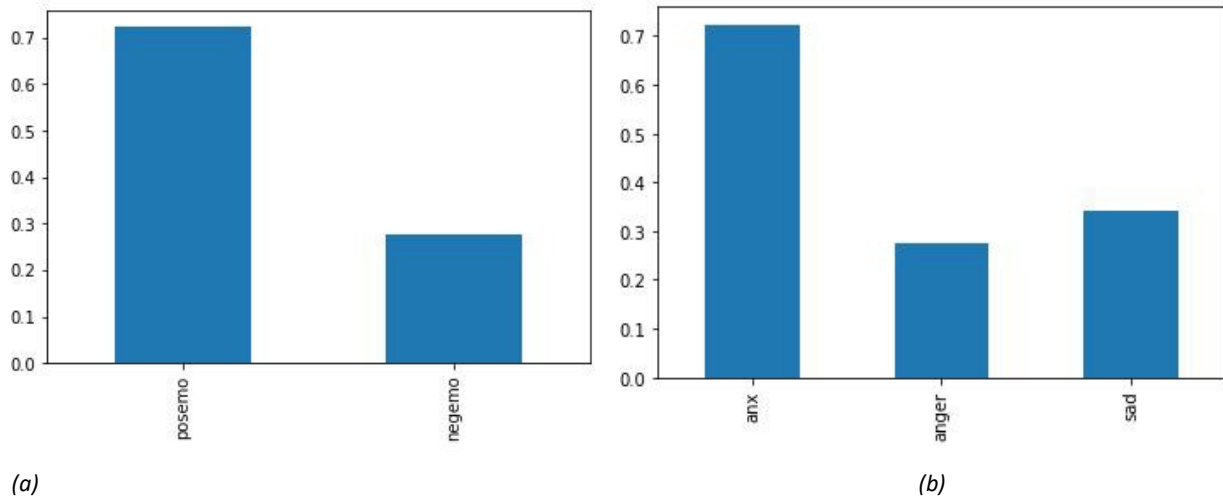


Figure 10: “social processes” categories extracted by the LIWC tool

Figure 10 shows the categories of “social processes” expressed by the mothers posting on the forum. They refer more often to their family, with an equal ratio between male and female.



(a) Figure 11: distribution of positive and negative emotions (a) and break down of the negative ones (b) in anxiety, anger and sadness.

As shown in Figure 11, forum posts tend to express positive emotion. Negative emotions, as shown in Figure 11(b), mainly refer to anxiety.

Network Analysis

Finally, we analyzed how individuals interact with each other by studying the networks that are created by the users commenting to the posts. To do so, we created a graph where the nodes are the users of the forum, and edges correspond to the fact a user commented on a post. The idea is that if the members of the community are engaged in active discussions, this will be reflected in a highly connected and dense graph. We compute density for both the global graph and subgraphs related to the single sections for the forum.

Forum	density
tienermoeders-gezocht	0.017
aangeboden	0.018
zwanger	0.018
gevraagd	0.045
algemene-discussie	0.032
jij-en-je-kind	0.032
zwangerschap-bevalling	0.030
zuid-nederland	0.029
west-nederland	0.033
noord-nederland	0.042
oost-nederland	0.069
midden-nederland	0.034
reageren-blogs	0.097
ik-doe-wel-mee	0.056
wat-jouw-behoefte-hulpverlening	0.5
ben-ik	0.2
winactie	0.333
financiering	0
media	0.5
Overall	0.011

Overall, the graph has very low density (0.011), meaning that graph is sparse. It seems that people contribute a little with their messages as they tend to keep their comments for specific posts and do not actively participate in different sections of the forum.

This seems to hold also if we consider the single parts; the majority of them show a density lower than 0.1. The sections showing a higher value of density have very low numbers of posts and comments.

Summary

Summarizing, while the forum provides specific sections for asking questions about pregnancy, childbirth and raising children, both the topic modeling and LIWC analysis show the young mothers mainly use the forum to express their need for connection and friends. This is in line with findings of the state of the art about parenthood and social media.

The posts revolve around the family and they express economical concerns regarding work and money. This seems unique to this specific case, as the investigated group most probably did not have a job to begin with or was forced unexpectedly to leave their work.

Interestingly, a good part of the forum is dedicated to the trading of products.

Positive emotions are prevalent. This can either reflect the real life situation of Dutch teen mothers or be connected to the characteristic of this community. Previous works have shown that negative emotions are connected to more personal information and to the side of one person's image that it is revealed only if the individual feels safe enough (Wang 2016)(Luo 2019)(Redmiles 2019).

Related to the previous point, the network analysis performed on the interaction between posts and comments revealed a very sparse graph, characterized by low density. This means users do not seem to be engaged in the discussions, as they keep the interaction limited to single posts. As a consequence, this results in a weak sense of community that may negatively influence people's inclination to disclose personal issues. This is important because previous studies shown as people are more open to honestly talk about themselves, it is more likely they will receive the support they are looking for (De Choudhury 2014)(Luo 2019).

Blog

In this section young mothers post a bit about their experiences. The section contains the stories of 11 mothers, whose age ranges between 14 to 20 years². Their activities also differ, the number of stories ranges from only 1 to 31; they also span across different years, from 2015 to 2019.

² Age here refers to the age when they were pregnant.

Topic Analysis

We performed topical analysis by computing multiple models and using the elbow method on the model's coherence to select the optimal topics number, obtaining 6 topics³.

- T0: Festivities and vacations (boodschap, koningsdag, verhuizen, inschreven, eten, verjaardag, bront, jaar, kruidnoot, lekker)
- T1: Pregnancy (boek, prikje, bloeddruk, moeder, echo, sprong, ouder, auto, zwanger, ziekenhuis)
- T2: Personal stories (naam, genieten, ziekenhuis, uur, moeder, artikel, helpen, ding, lezen)
- T3: Experiences with doctors (wc, artikel, helpen, leuk, pijn, zeggen, huisarts, ding, lezen, dokter)
- T4: Child growing (slapen, bed, pot, eten, meubel, ziek, staan, ziekenhuis, huis, wieg)
- T5: Friends (geluk, vriend, jaar, leren, dokter, bloggen, examen, ontzettend, vertellen, artikel)

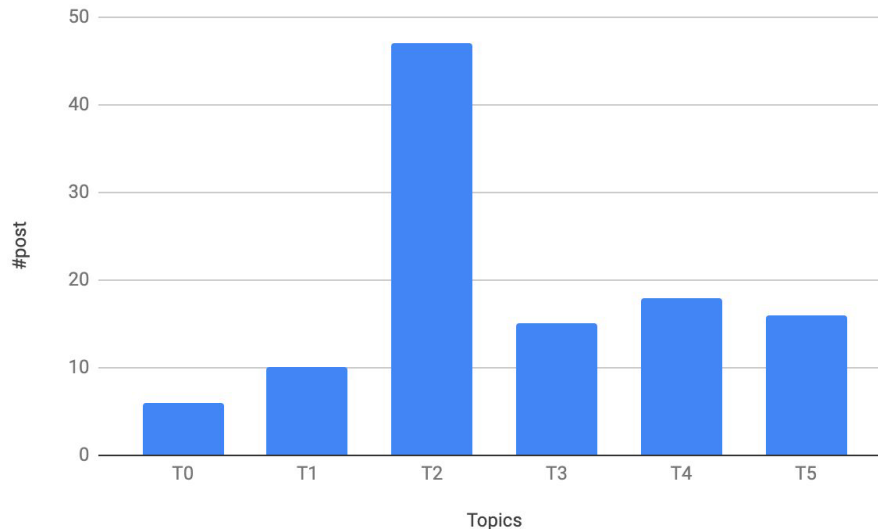


Figure 13: Overall distribution of topics in the blogs

As expected from a blogging platform, the most occurring topic is T2. Mothers seem to mainly use the platform to tell their everyday life, sharing their struggles and difficulties. Then, they also share pleasant and happy moments, such as their child growing up (T4) or vacations spent together (T0). It is worth noticing that also in blog stories it is mentioned the importance of having friends (T5).

³ For this first iteration I still considered one blog post concerning only one topic. I am aware that, since the blog posts are long, they could cover more topics.

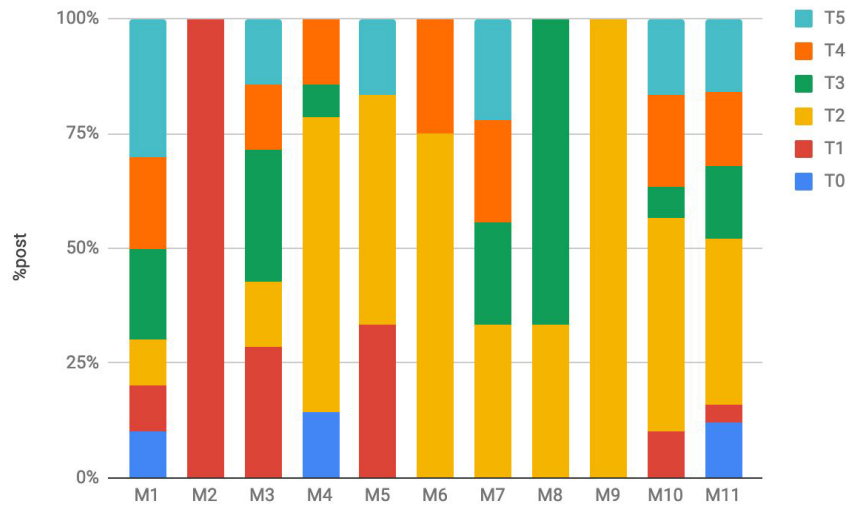


Figure 14: distribution of topics across the young mothers

Figure 14 shows the distribution of the topics between the different users. They show a very diverse distribution of topics. M1, M3, M10 and M11 stories cover all the topics, while M8 and M9 are limited to a couple. However, this seems related to the amount of stories posted (Even though M10 and M11 posted 25 and 30 stories, while M1 and M3 only 10 and 7 respectively).

Psycholinguistic analysis

As described in the previous Forum section, here we aim at getting insights on thoughts, feelings, personality, and motivations that emerge from the story posted by the young mothers on tienermoeders.nl.

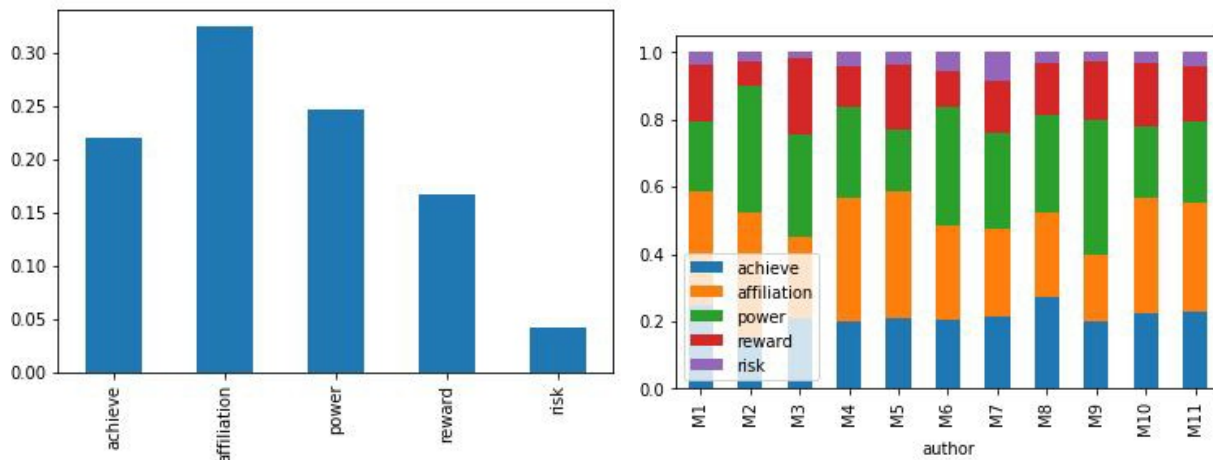
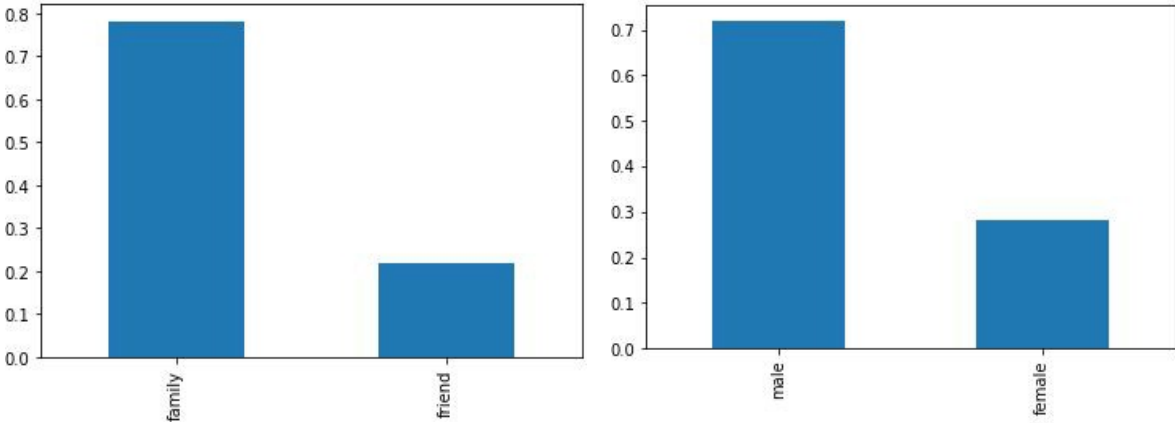
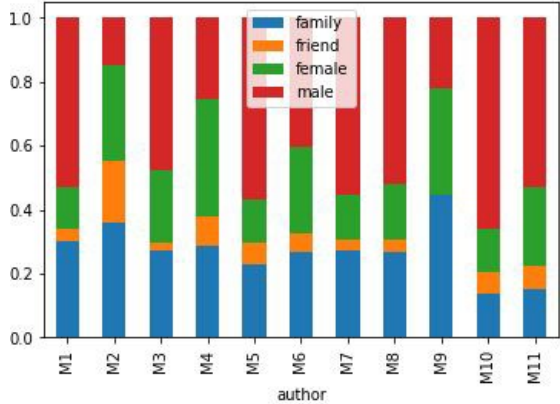


Figure 15: Overall distribution of drives (a) and breakdown (b) for each author.

Figure 15(a) shows the distribution of drives extracted by the LIWC tool. There are three main top drives: affiliation, power and achievement. This means that, in their blog, young mothers express their desire to belong to a group, their will to regain control of their life and the need to set and set and accomplish goals. The ratio of these categories seem constant among the blog authors, with the exception of M2 and M9, where the power drive is ranked first.



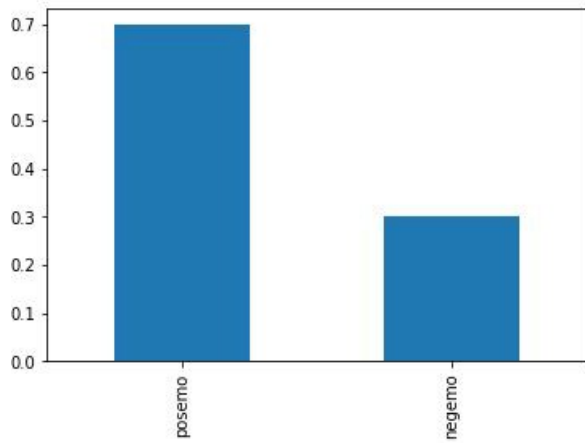
(b)



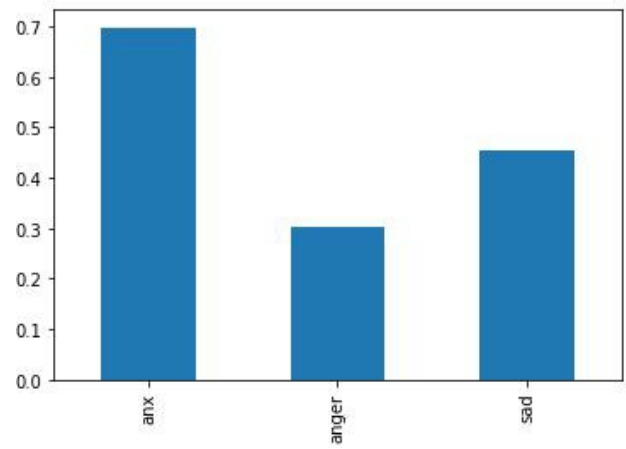
(c)

Figure 16: Overall distribution of “social processes” (a,b) and breakdown for each author (c).

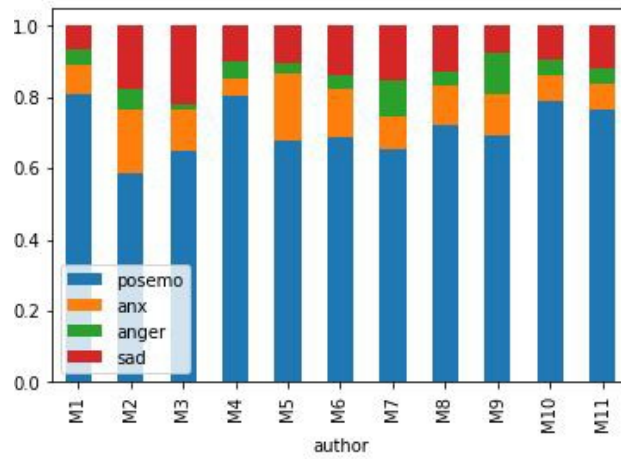
Figure 16(a) and (b) shows the distribution of references of the social sphere of the young mothers. They refer more to their family than friends, and to male more than female. The difference in the male / female ratio, shown in Figure 16(c), seems to be related to the gender of the child (e.g., M4 and M10 have males).



(a)



(b)



(c)

Figure 17: Ratio between positive and negative emotions (a). Breakdown of different types of negative emotions (b) and sentiment distribution between the authors (c).

LIWC analysis shows - as presented by Figure 17 - positive emotions are predominant in the blog stories. Negative emotions mainly include anxiety and slightly more sadness with respect to the forum.

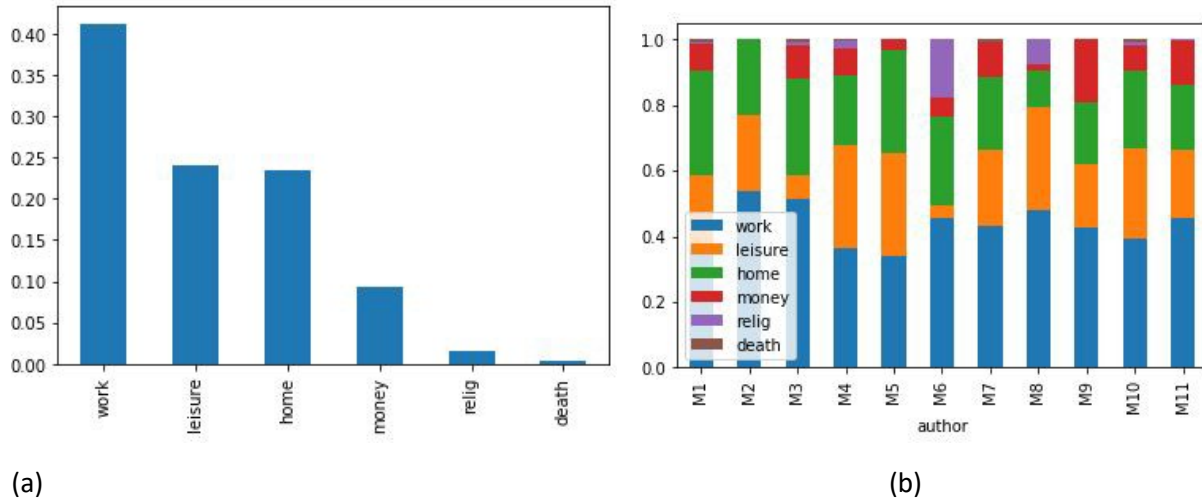


Figure 18: Overall distribution of concerns emerging from the blog posts (a) and breakdown for each author (b)

The three top concerns - work, leisure and home, as shown in Figure 18(a) - refer to different aspects of the personal stories that are told through the blog posts. As the *work* concern is linked to both jobs and school related terms, it refers to stories about the difficulties of being at school or working while being pregnant; *leisure* refers to vacation time or happy moments spent with their child; while *home* includes all the daily experiences.

Summary

The blog's stories show some similarities with the posts submitted to the forum. In both cases they express their desire to belong to a group and the importance of connections and friends. In addition, in their narratives, they talk about their goals and their will to take their life back in their hands. Together with the general positive attitude presented in their stories, it summarizes the general message they want to send to the other young mothers who are reading the blogs. This is important, because - as stated in the state of the art (Lupton 2016) - both the writer and the reader are empowered by the stories.

The topics and the concerns well summarize the content of their stories: the difficulties of being at school or working while being pregnant; happy and troublesome moments spent with their child and experiences with doctors.

Discussion

With this study we got an understanding on the content shared of both forum posts and blog stories. By looking at the findings of topic modeling, LIWC analysis and the activities on the different sections of the forums we can summarize the content in: pregnancy and parenting information, asking/providing social support and exchange of product.

This information can be used to inform both policy makers and designers to inform the development of future solutions. Avoiding the isolation of new mothers is crucial, any future policy should facilitate the creation of groups, given also the specific situation teen mothers are in. Since the sections of the forum related to exchange of products are fairly active, a market based initiative could be used to promote communication between individuals.

Web platforms have been proved successful in supporting young mothers. The website of tienermoeders.nl has the potential to provide a bigger support, because at the time of the study, the underneath community didn't seem very strong and engaged, and the mothers writing the blog stories showed an uneven amount of activity - and the forum section dedicated to their discussion (e.g., *reageren-blogs*) is very active.

It is not clear why the engagement in the community seemed so low, it can be related to the number of members, to socio-cultural factors, or maybe other parts of the website are more appreciated. The website is present also on other social media: Facebook, Instagram, Twitter and YouTube. A bigger effort on those platforms (e.g., Instagram has only one post⁴) may be enough to increase the number of members to the necessary critical mass to create a stronger community.

Also, the forum-based interface is not - anymore - a proper way to engage young people, who are now used to social media. While a solution would be to completely renew the tienermoeders.nl interface to mimic a social media one, such an extreme need to be carefully thought and designed. In this case, involvement of the teen mothers - using a co-design approach - on the design of a new platform would be very beneficial to create a product that satisfies all the requirements.

Conclusion and Future works

In this work we presented a first study on the tienermoeders.nl platform. We analyzed with automatic methods the content shared in the blog stories and in the forum. Our results show similarities with the state of the art regarding technology and motherhood. From our findings we derive some suggestions for policy makers and designers.

While automatic approaches have the advantages of unobtrusiveness and scale - and shown consistent results - they may not be able to capture some subtle features of the language, neither can be shaped to ask specific questions. For these reasons, next steps should include an active engagement with either the user of the forum or teen mothers to complement the findings of this study.

⁴ Visited on 30/03/2020.

References

Archer, C., & Kao, K.-T. (2018). Mother, baby and Facebook makes three: does social media provide social support for new mothers? *Media International Australia*, 168(1), 122–139. <https://doi.org/10.1177/1329878X18783016>

Barkin, J. L., & Jani, S. (2016). Information Management in New Motherhood: Does the Internet Help or Hinder? *Journal of the American Psychiatric Nurses Association*, 22(6), 475–482. <https://doi.org/10.1177/1078390316659697>

Boath, E. H., Henshaw, C., & Bradley, E. (2013). Meeting the challenges of teenage mothers with postpartum depression: overcoming stigma through support. *Journal of Reproductive and Infant Psychology*, 31(4), 352-369.

De Choudhury, M., & De, S. (2014, May). Mental health discourse on reddit: Self-disclosure, social support, and anonymity. In *Eighth international AAAI conference on weblogs and social media*.

Fahey, J. O., & Shenassa, E. (2013). Understanding and meeting the needs of women in the postpartum period: the perinatal maternal health promotion model. *Journal of midwifery & women's health*, 58(6), 613-621.

Gibson, L., & Hanson, V. L. (2013). "Digital motherhood": How does technology support new mothers? In *Conference on Human Factors in Computing Systems - Proceedings* (pp. 313–322). <https://doi.org/10.1145/2470654.2470700>

Jomhari, N., Gonzalez, V. M., & Kurniawan, S. H. (2009). See the apple of my eye: baby storytelling in social space. *People and Computers XXIII Celebrating People and Technology*, 238-243.

Lazard, L, Capdevila, R, Dann, C, Locke, A, Roper, S. (2019) Sharenting: Pride, affect and the day-to-day politics of digital mothering. *Soc Personal Psychol Compass*; 13:e12443. <https://doi.org/10.1111/spc3.12443>

Logsdon, M. C., Wisner, K. L., & Pinto-Foltz, M. D. (2006). The impact of postpartum depression on mothering. *Journal of Obstetric, Gynecologic & Neonatal Nursing*, 35(5), 652-658.

Luo, M., & Hancock, J. (2019). Self-Disclosure and Social Media: Motivations, Mechanisms and Psychological Well-Being. *Current Opinion in Psychology*.

Lupton, D., Pedersen, S., and Thomas, G. M. (2016) Parenting and Digital Media: From the Early Web to Contemporary Digital Society. *Sociology Compass*, 10: 730–743. doi: 10.1111/soc4.12398.

Madge, C., & O'Connor, H. (2006). Parenting gone wired: empowerment of new mothers on the internet?. *Social & Cultural Geography*, 7(2), 199-220.

McClelland, D. C. (1987). *Human motivation*. CUP Archive.

McDaniel, B. T., Coyne, S. M., & Holmes, E. K. (2012). New mothers and media use: Associations between blogging, social networking, and maternal well-being. *Maternal and child health journal*, 16(7), 1509-1517.

Morris, M. R., & Ringel, M. (2014). Social networking site use by mothers of young children. In *Proceedings of the 17th ACM conference on Computer supported cooperative work & social computing - CSCW '14* (pp. 1272–1282). New York, New York, USA: ACM Press. <https://doi.org/10.1145/2531602.2531603>

Parry, D.C., Glover, T.D., & Mulcahy, C.M. (2013). From "stroller-stalker" to "momancer": courting friends through a social networking site for mothers.

Pennebaker, J.W., Booth, R.J., Boyd, R.L., & Francis, M.E. (2015). *Linguistic Inquiry and Word Count: LIWC2015*. Austin, TX: Pennebaker Conglomerates (www.LIWC.net)

Redmiles, E. M., Bodford, J., & Blackwell, L. (2019, July). "I Just Want to Feel Safe": A Diary Study of Safety Perceptions on Social Media. In *Proceedings of the International AAAI Conference on Web and Social Media* (Vol. 13, No. 01, pp. 405-416).

Schoenebeck, S. Y. (2013, June). The secret life of online moms: Anonymity and disinhibition on youbemom.com. In *Seventh International AAAI Conference on Weblogs and Social Media*.

Wang, Y. C., Burke, M., & Kraut, R. (2016, February). Modeling self-disclosure in social networking sites. In *Proceedings of the 19th ACM conference on computer-supported cooperative work & social computing* (pp. 74-85).