

‘Is Platform Capitalism Doomed’? Ask the Workers
*Framing and Legitimation of New Forms of Organizing
in the On-Demand Economy*

Authors:

Jovana Karanovic (Vrije Universiteit Amsterdam), Hans Berends (Vrije Universiteit
Amsterdam), and Yuval Engel (University of Amsterdam)

September 1, 2017

Abstract

Novel solutions to the universal problems of organizing, pertaining to the division of labor and integration of effort, must be perceived as legitimate by workers in order for an organization to be viable in the long run. This study brings to the forefront the overlooked perspective of workers, arguing that they do not always succumb to organizing solutions imposed upon them. Using a topic-modeling analysis of 120,116 forum posts on uberpeople.net – the most popular forum for Uber drivers – this study explores the drivers’ perspective on Uber’s platform capitalism – representing the dominant form of organizing in the on-demand economy. Drawing on the scholarly tradition of frames and framing and applying it to an automated content analysis combined with qualitative-interpretive methods, the findings reveal that workers contest the majority of novel organizing solutions as put forth by Uber, namely those pertaining to reward provision as well as to how tasks are divided and assigned. I find that platform capitalism, with Uber as its archetype, is neither accepted nor seen as legitimate by workers. Furthermore, I observe that, over time, workers not only contest organizing problems, but also actively suggest alternatives, which speaks to their ongoing engagement in crafting new organizing solutions. The implications of these findings offer several important contributions to the literature on framing and new organizational forms, primarily by bringing to light the unexplored perspective of workers.

1. Introduction

Measured against a comparable group of organizations, new organizational forms must offer at least one novel solution to the four universal problems of organizing: (1) task division; (2) task allocation; (3) reward provision; and (4) information provision (Puranam et al., 2014). While solutions to these “universals of organizing” are “individually necessary and jointly sufficient for an organization to exist” (Puranam et al., 2014, p. 166), long term survival depends on whether solutions are legitimated (Hsu & Hannan, 2005; Meyer & Rowan, 1977; DiMaggio, 1988; Fligstein, 1996b, Powell, 1998). In other words, legitimacy is the bloodline of new organizational forms, which survive by virtue of relevant audiences – “collections of agents with an interest in a domain and control over material and symbolic resources” (Hsu & Hannan, 2005, p. 476).

While scholars have long recognized institutional entrepreneurs (e.g. Battilana et al., 2009; Polos et al., 1998; Rao et al., 2000) and top managers (e.g. Fiss & Zajac, 2006) as powerful agents who can drive legitimation processes through their influence over other audience members, the perspective of workers continues to receive limited attention. Thus, although scholars have called for incorporation of perspectives at lower levels of the organizational hierarchy (Burgelman, 1983), and suggested more research on individual and group-level adaptations to new organizational forms (Rao et al., 2000), few such studies emerged so far. This omission is surprising since workers do not always fall prey to managers’ tactical strategies but can and do oppose them (Chreim, 2006). Furthermore, workers are at the forefront of organizations and experience both organizing problems and their solutions first-hand. Put differently, when it comes to the legitimacy of new organizational forms, workers matter.

In order to fill this gap in literature and explore the workers’ perspective further, this study draws upon the literature on frames and framing. Frames refer to “interpretive principles of organizing and assigning meaning that are outcomes, or products, of social construction” (Cornelissen and Werner, 2014, p. 197), whereas framing is an activity of comprehending the situation at hand, that is, what the frames apply to (Goffman, 1974). Framing is a process that evolves over time (Benford & Snow, 2000); therefore, frames can change as a result of interaction with others, leading individuals to reexamine their own frames (Hargadon & Bechky, 2006). In the context of this study, framing and its corresponding frames are thought to inform workers’ experiences with novel organizing solutions, the meaning they attach to them, and possible alternative solutions that might emerge as a result of interactions with others. Frames are relevant here because they can also

be interpreted as “theories that justify an organizational form” (Rao & Kenney, 2008, p. 353), which makes them particularly suitable for studying the evaluation of legitimacy (Croidieu & Kim, 2017).

As a research context, I focus on new forms of organizing in the on-demand economy, which is a sub-group of platforms within the broader domain known as “the platform economy” (Davis, 2016). While the platform economy is a general term for businesses that enable digital activities, such as Uber for cars and Facebook for social interaction (Kenny & Zysman, 2016), the on-demand economy refers to an online marketplace for exchange of services (Frenken & Schor, 2017). An important characteristic of platforms is that “they all depend on the digitization of value-creating human activities” (Kenny & Zysman, 2016, p. 62), and in the case of the on-demand economy, a part of that value comes back to individuals as income, hence they are also referred to as “labor platforms” (Fabo, Karanovic, Dukova, 2017).

The so called “platform capitalism” is currently the prevailing form of organizing in the on-demand economy, referring to online, and often mobile systems connecting buyers and sellers for the sake of creating shareholder value (i.e., Uber) (Davis, 2016). Since platforms (e.g. Uber, Lyft, Helpling) were able to solve organizing problems differently from traditional organizations (e.g. Uber assigns tasks via an app), they can be thought to represent a completely new form of organizing (Davis, 2016; Powell, 2016; Huner, 2016; Sundaararajan, 2014). However, organizations adopting a platform capitalism model have also been heavily criticized for generating a new class of low-income laborers (Davis, 2016; Rogers, 2015), engaging in evasive practices aimed at circumventing and exploiting regulatory contradictions (Elert & Henrekson, 2016), and for shifting risk to workers (Rogers, 2015). Such criticism is so particular to this class of organizations because unlike traditional businesses, platforms leverage network effects (Rogers, 2015; Van Alstyne et al., 2016); meaning, they extract value from interaction of individuals on the platform. Therefore, it is evident that workers are platforms’ key asset (Davis, 2016); however, their perspective on platform capitalism, although very relevant, has received very little attention. Precisely because of these unique features that set the on-demand economy apart from traditional businesses, does the perspective of workers surface as vital to the survival of new organizational forms. Therefore, the aim of this study is to answer the following research question:

How do workers frame the novel organizing solutions introduced by on-demand economy organizations and

how do such frames serve to legitimate, contest, or offer alternative organizing solutions over time?

To answer this research question, we employ the quantitative technique of topic modeling to analyze 120,116 forum posts of uberpeople.net – the most popular forum for Uber drivers. This study grounds its logic on the premise that vocabularies can reveal actors' perceptions, meaning structures (Loewenstein, Ocasio, and Jones, 2012), as well as novel ideas (Kaplan & Vakili, 2015), positioning this automated content analysis method as extremely relevant for our research question. Uber, as the most prominent example of a platform, valued at over \$60 billion (Hartmans & McAlone, 2016), and with an army of more than 327,000 drivers (Hartmans, 2016), provides an ideal empirical context for this study. The forum uberpeople.net begun as a place where drivers can freely voice their opinions (Bowles, 2016), and it therefore promises to offer valuable insights when it comes to drivers' experiences.

My findings demonstrate that workers do not always succumb to organizing solutions imposed upon them but rather engage in actively debating the issues at hand, contesting them, revising them, or proposing alternatives. Three out of the four organizing problems that Puranam et al. (2014) defined theoretically, namely task division, task allocation, and reward provision, were empirically found to be actively contested by workers. By studying how workers frame platform capitalism - a new form of organizing in the platform economy - this study makes three important contributions. Namely, we show that 1) an organization represents a new organizational form only when perceived as such by the relevant audience of evaluators; 2) workers do oppose managerial frames and craft new solutions to the organizing problems and such process can be studied by using topic modeling as a methodology; and on a practical note, 3) workers do advice others to take actions that can negatively impact organizations, such as advising others to switch to the organization's competitors, hence managers should actively search for solutions that bring organization's frames and workers' frames in alignment.

2. Theoretical framework

In this section I review the relevant literature on organizational forms and framing. First, it is important to make a connection between Puranam et al.'s (2014) universal problems of organizing: task allocation, task division, reward provision, information provision, and legitimation of solutions to those problems by the relevant audiences. In this process, I highlight the distinction between a form of organizing and organizational form, and subsequently I emphasize that workers qualify as a relevant audience of evaluators whose

perspective continues to receive limited attention in the literature. Second, I discuss the processes by which organizing problems become legitimated, by providing an overview of several important constructs: frames, framing, and reframing. I stress the ability of workers to contest framing at the top levels of an organization’s hierarchy as well as the fact that framing is not always purposeful but can simply serve to organize experiences.

2.1 Organizing and organizational forms

Since an organization needs agents – workers – to take off and survive, it must prompt them to work towards the organization’s goal by solving the fundamental organizing problems pertaining to division of labor and integration of effort (Burton & Obel, 1984). Division of labor refers to an organization specifying the work that needs to be done and the membership base executing the task (Tushman & Nadler, 1986, p. 79), while the integration of effort refers to the solutions to cooperation and coordination problems, with both being crucial to successful integration (Heath & Staudenmayer, 2000; March & Simon, 1993, p. 2). Puranam et al. (2014) break these two major problems of organizing into four components: (1) task division: defining goals and identifying tasks that need to be completed to reach these goals; (2) task allocation: dividing tasks among agents; (3) reward provision: rewarding agents for those tasks; and (4) information provision: providing agents with necessary information for successful execution of their duties (see Figure 1). These four problems are interrelated, and Puranam et al. (2014) argue that each form of organizing must solve these problems in order to survive.

Figure 1. Puranam et al.’s (2014) criteria for new forms of organizing



The solutions to the above-illustrated organizing problems, which a number of scholars called for (e.g. Miller, Greenwood, and Prakash, 2009; Greenwood and Miller, 2010), represent an organizational form only when accepted by a relevant audience of

evaluators (Puranam et al., 2014). “The concept of organizational form refers to those characteristics of an organization that identify it as a distinct entity and, at the same time, classify it as a member of a group of similar organizations” (Romanelli, 1991, p. 81-82). Puranam et al. (2014), on the other hand, emphasize that a form of organizing strictly refers to “how the organization works” (p. 175). Therefore, once the problems of organizing are introduced, they have to be legitimated by relevant audiences (Hannan & Freeman, 1977; Hus & Hannan, 2005). These relevant audiences are agents who have some stake and interest in the resources of the organization, such as workers and the government, for instance (Hsu & Hannan, 2005). While workers can also aid the process of legitimizing organizational forms and not just top managers and institutional entrepreneurs, workers’ perspective and influence received very little attention in the literature (Burgelman, 1983). Workers must accept solutions to organizing problems and embrace them in order to work towards the organization’s goal, however, they have traditionally been assumed to submit to managerial decisions although some scholars (e.g. Chreim, 2006) showed this is not always the case.

2.1.1 A new organizational form and its legitimacy

The concept of legitimacy refers to “a generalized perception or assumption that the actions of an entity are desirable, proper and appropriate within some socially constructed system of norms, values, beliefs and definitions” (Suchman 1995, p. 574). The literature has dedicated much attention to the legitimation of new organizational forms as led by powerful institutional entrepreneurs who commence collective action (e.g. Polos et al., 1998; Rao et al., 2000), mobilize resources, and leverage networks (Swaminathan & Wade, 1999). Within organizations, top managers are said to look for alternatives to organizational forms as a crucial management tool for responding to changing environmental conditions by “integrating the enterprise’s existing resources to current demand” (Chandler 1962, p. 383). To ensure their fellow workers follow the suit and embrace the new logic, which entails new values and beliefs, managers rely on strategic framing (e.g. Fiss & Zajac, 2006). However, they are not always successful in influencing workers in this way because workers are not just passive listeners who cannot contest frames imposed upon them (Chreim, 2006). Quite the contrary, not only can the workers craft solutions to the organizing problems, as such power does not reside with authority figures per se (Puranam et al., 2014), but they can also evaluate them, in this way aiding or hampering their legitimation.

McKalvey (1982) suggested that the ways of organizing are contemplated, at least for some time, “in the minds of individual employees” (Romanelli, 1991, p. 86). But what can workers tell us and how do they get a message across? Plausibly, workers are the ones that

experience these solutions first-hand and, being mobile and free to interact with one another, they can communicate their interpretations of the suggested solutions to others, as well as create variations to these solutions. Hence, interactions serve as vehicles by which alternative solutions to the organizing problems are transmitted (Romanelli et al., 1991). Furthermore, Daft and Lewin (1993) suggested that workers are expected to be more cognitively and emotionally involved in organizations as their autonomy increases, and with modern organizations leaning towards flatter hierarchies, decentralization of decision making, and empowerment of workers, this seems to be the case. Therefore, the perspective of workers appears unjustly buried beneath the dominant managerial perspective. In order to explicate the process by which workers can legitimate new organizational forms and perhaps alter them, the following section reviews the literature on framing.

2.2 Frames, framing, and reframing

The concept of frame was advanced by Goffman (1974), for whom frames serve as “schemata of interpretation”. Stated differently, frames interpret events, organize experiences, and assign meanings and responsibility, enabling processes to unfold on a collective level (Cornelissen & Werner, 2014; Benford & Snow, 1992). Consequently, frames can serve as theories that validate organizational forms (Rao & Kenny, 2008). While frames reveal how individuals organize experiences (Benford & Snow, 2000), framing, by definition, implies agency, as well as a process that evolves over time (Benford & Snow, 2000). Therefore, framing is an activity of comprehending the situation at hand or comprehending what the frames apply to (Goffman, 1974). The classic example given by Bateson (1972) is that a monkey needs to understand whether a push from another monkey corresponds to the frame of play or the frame of fight.

Scholarship on framing has traditionally focused on framing processes among and across organized groups (e.g. Benford & Snow, 2000; Kaplan, 2008). As mentioned, this usually involves skilled actors like managers (Fairhurst and Sarr, 1996), institutional entrepreneurs (Battilana, Leca, & Boxenbaum, 2009), and social movement leaders (Benford & Snow; 2000; Kaplan, 2008), who attempt to influence other actors for the purpose of mobilizing support and/or resources, most commonly through language and symbolic gestures (Cornelissen & Werner, 2014). However, the field could benefit from including the perspectives of lower levels of organizational hierarchy (Burgelman, 1983), especially because unorganized actors, such as workers, can also trigger field level changes (Ansari et al., 2016). The activity of managers influencing other audience members for the purpose of altering their meaning and interpretations regarding various organizational

situations is referred to as ‘reframing’ (Chreim, 2006, p. 1261). Chreim (2006), however, showed that workers do not always align with managerial frames. Resisting managerial frames can have consequences for the organization in terms of lower revenue, and managers will have to devote more attention and resources “to manage dissension and bring alignment of employees with managerial frames” (Chreim, 2006, p. 1282). Therefore, in general, the literature on frames, framing, and reframing can be divided by strategies aimed at mobilizing support, or purposeful framing, and framing in unorganized settings, which serves to organize experiences, and to which we devote further attention.

2.2.1 Frames and framing in self-organized settings

Recognizing that workers, as the relevant audience members, do not always align with managerial frames and can contest them, points to an important gap in the literature on framing of new organizational forms. The scholarship has focused on outcomes of framing processes such as frame alignment and appropriation (Snow et al., 1986; Chreim, 2006), disregarding the meaning struggle that precedes such outcomes. Logically, before a settlement over meaning is reached, there is a negotiation of that meaning and active struggle over it (Kaplan, 2008). Those processes are crucial to devote attention to because they can precede an emergence of a frame over which workers might eventually collectively settle around (Cornelissen & Werner, 2014).

Workers can be seen as active agents who first, comprehend the message, and second, form interpretive frames around that message. Such frames do not have to only accept or reject the issue at hand (Bavelas, Coates, and Johnson, 2000), but can also reframe the issue, in this way guiding or forming grounds for the interpretation by other members. Since framing is not a one-off thing but a process, individuals can change the ways they interpret situations, which most commonly happens through interaction with others. Via interactions, individuals might start reexamining their own frames (Hargadon & Bechky, 2006). Through this process of meaning struggle, they might set the building blocks of the new organizational forms (Cornelissen & Werner, 2014). Although contention is a sign of construction of new organizational forms, little attention has been dedicated to this important activity (Rao, Morrill, and Zald, 2000). In order to study how workers frame a new organizational form in the platform economy, we use topic modeling, which will reveal frames that speak of workers’ perception of the organizational form in question.

3. Methodology

This paper explores how workers frame novel organizing solutions introduced by organizations in the on-demand economy, and how such frames serve to legitimate, contest,

or offer alternative organizing solutions over time. We focus on Uber in particular, as the most well known example of a platform that embodies platform capitalism as a new form of organizing (Davis, 2016). The forum *uberpeople.net* was selected as a site of exploration, as it is the most popular forum for Uber drivers, thus it promises to offer a representative dataset for the exploration of workers' perspectives. The dataset consists of 120,116 forum posts created in the period between April 9th, 2014 and February 14th, 2017, which encompasses the spectrum of available data.

To analyze the data, this study employs Structural Topic Model (STM) - a framework for topic modeling that allows for discovery of latent themes present in a collection of documents (Blei, 2012), and their relationship with other covariates (Roberts, Stewart, & Airoidi, 2016). The method allows for an automated content analysis (Mohr, 1998; Krippendorff, 2004), wherein a researcher only needs to specify a number of topics, making it the method of choice for large datasets of unorganized text (Reich et al., 2015). Unlike the most common content analysis methods (e.g. word counts) that rely on pre-determined guidelines, topic modeling is inductive, which makes it very appropriate for studies explorative in nature such as the one in question. Furthermore, the recent use of topic modeling by management scholars such as Kaplan and Vakili (2015), Boudreau et al. (2014), and Croidieu and Kim (2017), speak of its efficacy and emerging popularity within the field. In the subsequent sub-sections, we further elaborate on the research setting, data, and the analytical strategy, including a detailed explanation of topic modeling, considering it is a relatively new methodology in the field of management.

3.1 Research setting

Studying workers' framing of platform capitalism, a new form of organizing in the platform economy, and Uber specifically, as the most prominent example, offers exciting potential for several reasons. First, the platform economy is seen as the future of the marketplace for its exchange of goods and services. Forecasted to add €572 billion to Europe's economy (European Commission, 2016), it earned the top place on the EU Commission's policy agenda (Fabo, Karanovic & Dukova, 2017). Second, when it comes to platforms, different things count compared to traditional businesses, hence they provide an interesting study context. Platforms operate in what economists call "two-sided markets" (Eisenmann, Parker, & Van Alstyne, 2006), in which the economic value is created by exploiting 'interactions' within and across groups of users (Rochet & Tirole, 2003). Platforms rely on the network of produce and consumers (e.g. Uber drivers and Uber passengers) (Van Alstyne et al., 2016) vs. real-estate or intellectual property such as traditional businesses. Since network effects are

strong when the rise in the number of people on one side of the market makes the platform more attractive for the users on the other side of the market (Katz & Shapiro, 1985), workers emerge as the value-creators on the platforms (Davis, 2016). This property of network effects makes the platforms particularly relevant for this study that is concerned with workers' perspectives. Uber is a platform that is considered a frontrunner in the on-demand economy and the most representative example of platform capitalism.

Uber was founded in 2009 by Travis Kalanick and Garrett Camp. It currently operates in 58 countries and it is worth over \$60 billion (Hartmans & McAlone, 2016). This fast-growing company is credited for starting the “uber of everything”, serving as a role model for businesses like Foodora, Deliveroo, Helpling, and UpWork. Not only did Uber set an example for others in terms of a business model, it also fought numerous regulatory battles, carving the path for other platforms. For instance, when two UK employees were classified as employees in October 2016 and not independent contractors in a landmark court ruling, experts argued that “other firms with large self-employed workforces could now face scrutiny of their working practices” (Osborne, 2016). Furthermore, Uber is a controversial company accused of treating its drivers poorly and discriminating employees based on gender (Lashinsky, 2017). To make matters worse, several Uber executives recently received sexual assault accusations (Solon, 2017), engaging this company in heated debates. Finally, Uber is the most valued platform and has the biggest army of workers, namely more than 327,000 (Business Insider, 2015). Therefore, considering Uber's status, market valuation, and market share, it makes it a very attractive company for the study in question.

3.2 Data

The analysis is based on 120,116 forum posts extracted from uberpeople.net by web crawlers. UberPeople is an “independent community of rideshare drivers” with over 95,000 drivers, making it the largest and most popular forum of the kind (Kiberd, 2016). It was initiated in April 2014 by an anonymous Uber and Lyft driver, who wanted others to have a place to share their experiences (Kiberd, 2016). Its users say they use the forum to connect with the community, as well as seek and offer advice (Bowles, 2016).

The metadata includes five variables: post text (referring to a forum post by a forum user), location (self-reported by users), gender (self-reported by users), post title (referring to a subject or a thread created by a forum user), and date (referring to a date of the post). The available forum posts have been generated by 24,058 unique users, of which 2,853 are female and 16,492 male users (4,713 users have not reported their gender). Most of the forum users are Uber drivers, although some posts may have been generated by other on-demand workers,

as well as riders. The forum is mainly active in the United States, thus most posts have been generated by workers in the United States.

3.3 Analytical strategy

In order to analyze how workers in the on-demand economy frame the new form of organizing - platform capitalism - this study followed the steps of Croidieu and Kim (2017) by using content measures of legitimacy. Topic modeling, and in particular, structural topic modeling, emerged as the suitable method because it has been designed for studying the meaning structures in a large text corpora (DiMaggio et al., 2013). Additionally, structural topic modeling allows for incorporation of metadata, which allowed me to incorporate the date variable and explore the change in meaning structures over time. We followed the principles of grounded theory (Gioia, Corley, and Hamilton, 2013) in order to inductively construct a process by which workers' perceptions are conveyed. To analyze the forum text data, this paper used *stm* package of the R software as the primary tool.

3.3.1 Overview of topic modeling

Given the size of my dataset, topic modeling emerged as a suitable method (Mohr, 1998; Krippendorff, 2004). This method is designed for analyzing the meaning structures and their change over time in a large text corpus (DiMaggio, Nag, and Blei, 2013; Mohr and Bogdanov, 2013). In addition, this method is particularly useful for studying the emergence of a new technological field (Hall, Jurafsky, and Manning, 2008), which can be extended to new organizational forms, since both are characterized by novelty of both ideas and interpretations attached to those ideas. The method has recently been recommended for studying framing processes over time (DiMaggio et al., 2013), hence this study takes this suggestion on board by explicating it empirically. In addition, DiMaggio et al. (2013) have recently emphasized the usefulness of topic modeling for studying framing. Employing topic modeling promises to advance the empirical work in framing, which has lagged behind its theoretical developments (Benford, 1997). Following the suggestion of DiMaggio et al. (2013), this study sees each generated topic as a frame. Each frame is expected to provide information about how Uber drivers perceive the new form of organizing – platform capitalism. Furthermore, frames might contain indications of novel ideas or “cognitive breakthroughs” (Kaplan and Vakili, 2015, p. 1440), which could give insight into alternative solutions to organizing problems that every new form must solve in order to survive (Puranam et al., 2014).

We particularly employ Structural Topic Model (STM), since its key feature is the ability to incorporate the available metadata into the model (Roberts et al., 2014). Since this

study aims to look at framing processes over time, thus making use of the date covariate, this feature of STM was vital to my method selection. STM has been shown to yield superior results than latent Dirichlet allocation (LDA), the most frequently used type of topic modeling, when it comes to predictive power and subsequent qualitative interpretation (Roberts, Stewart, & Airoldi, 2014). The algorithm has several important features that are particularly useful for my study.

First, topic modeling allows us to analyze meaning structures. Intuitively, topic modeling uses an algorithm to identify words that occur within a collection of documents, deduce latent topics within them, and uncover originating documents that contribute the most to each generated topic (Blei, 2012). A topic is defined as “a mixture over words where each word has a probability of belonging to a topic”, whereas a document is a distribution over topics, hence a single document can contain multiple topics (Roberts et al., 2014, p. 2).

Second, the algorithm does not depend on pre-determined guidelines – it is a form of automated text analysis using machine learning, characterized by its unsupervised nature. In supervised learning, a researcher needs to determine some categories prior to the analysis, which a computer uses to predict how the rest of the documents would have been coded by the researcher (Reich et al., 2015). The advantage of topic modeling is that it is inductive - there is no need to specify categories prior to the analysis as the method allows for the data to infer the topics (Kaplan & Vakili, 2015). While the words in the documents are observed, the topics, their distribution per document, and distribution of words in topics, are unobserved and thus must be “discovered” (Blei, 2012), a procedure primarily based on Bayesian statistical theory (Gelman et al., 2014). Therefore, once the algorithm infers the topics, the researcher interprets their meanings based on the principles of grounded theory.

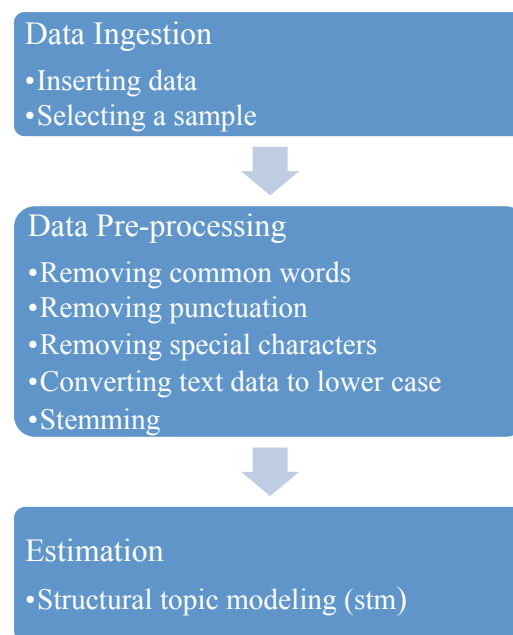
Third, topic modeling meets this study’s requirement for polysemy, which allows words to employ different meanings based on the contexts in which they appear (Kaplan & Vakili, 2015). This feature is an improvement in comparison to widely used text analysis methods in social sciences such as word count and keywords analysis (Kaplan & Vakili, 2015). Finally, while LDA assumes independence among topics, STM accounts for correlation among them (Robert et al., 2014), thus it allows me to determine which topics are correlated with one another.

3.3.2 Procedures

To employ Structural Topic Model (STM), I followed the suggestions of Roberts et al. (2014) for selecting a model based on exclusivity and semantic coherence criteria. The technical details behind the model selection are reported in Appendix. Initially, 30% of the

data was used for training purposes, whereas the final model was estimated on the entire dataset consisting of 120,116 observations of two variables: post text and date. Topic modeling requires little pre-processing; therefore, only the most frequent pre-processing steps were performed, such as removing the common words, punctuation, and special characters. The workflow of this initial set of data analysis, which follows the steps suggested by Roberts et al. (2014), can be seen in Figure 1. The first two steps refer to data preparation, while the third step refers to model estimation, which is at the core of the analysis.

Figure 2. Data Analysis Workflow

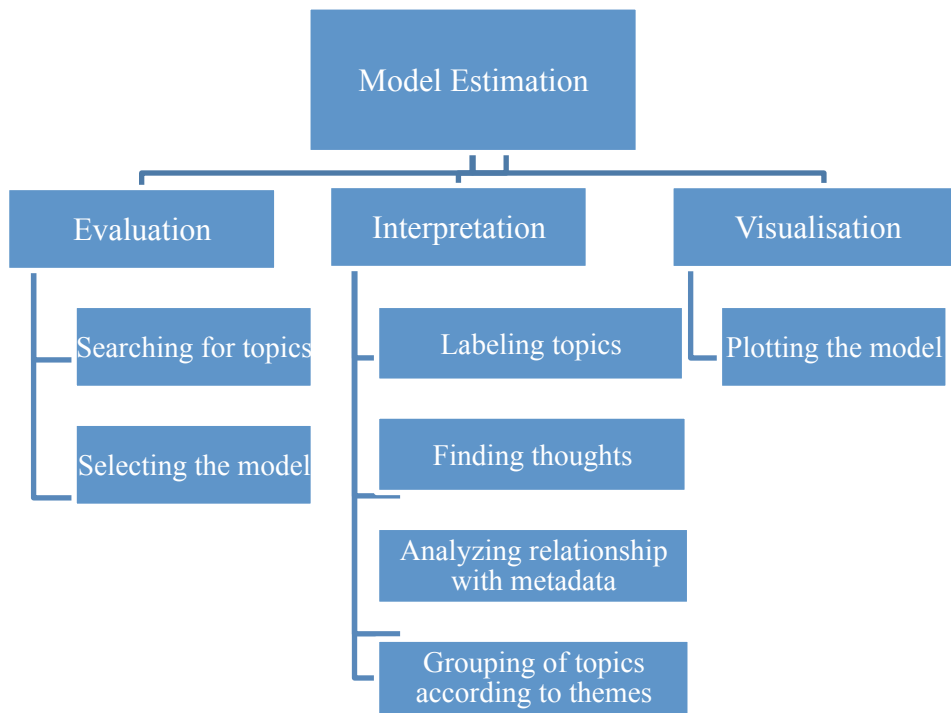


To estimate the Structural Topic Model (STM), we used date as a covariate. The first reason for choosing this variable is an assumption that the date will influence how and with what prevalence a certain topic is discussed, and secondly, incorporating the date variable allowed me to examine framing over time, which is what my research question aims to answer. In other words, the prevalence of the topic or how often the topic is discussed is predicated to vary with date. This prediction had no ex-ante assumptions since there was no way to know the topics prior to the analysis. The choice of model was based on 10 different starting values. First, I tested the model for the suggested 100 topics (Blei and Lafferty, 2007; Hall et al., 2008) and then lowered the number of topics with the understanding that constraining the number of topics makes the interpretation more viable. The final model consisting of 30 topics was selected based on exclusivity and semantic coherence criteria, as suggested by Roberts et al. (2014) (see Appendix).

After the standard set of procedures was executed, such as sorting of the topics according to prevalence, human analysis guided the subsequent steps. First, to label the topics

(the first step of interpretation; see Figure 3.), we looked at the 10 most probable words that generated each topic, as well as at the top 10 FREX words, which are the words that are both frequent and exclusive to a particular topic. Second, to get an intuitive sense of the topics, we searched for representative documents that contain the most probable words per topic. Subsequently, relationships between the post text and date were estimated by aggregating the mean proportion of word assignments for each time period (months per year). Finally, following principles of the grounded theory (Gioia, Corley, and Hamilton, 2013) and referring to the example of DiMaggio et al. (2013) for using topic modeling to study framing, the topics were grouped by first-order themes, second-order themes, and aggregate dimensions. In order to group the topics by themes, we first looked at the most probable words for each topic. For instance, the terms: *pax* [*passenger*], *get*, *pick*, *wait*, *drop* make it clear that the topic is about “rides”. After reviewing the terms, we looked at the most probable forum posts that generated that particular topic. This gave me an intuitive sense of what the topic is about and how forum users discuss it. Following this analysis, we realized that a number of topics spoke of Uber in a negative, frustrated, manner, hence I refer to these topics as “contestation topics”. On the other hand, a number of topics concerned advice giving and advice seeking, which in general discussed the solutions to organizing problems at Uber in a more neutral manner, hence I refer to these topics as “neutral topics”.

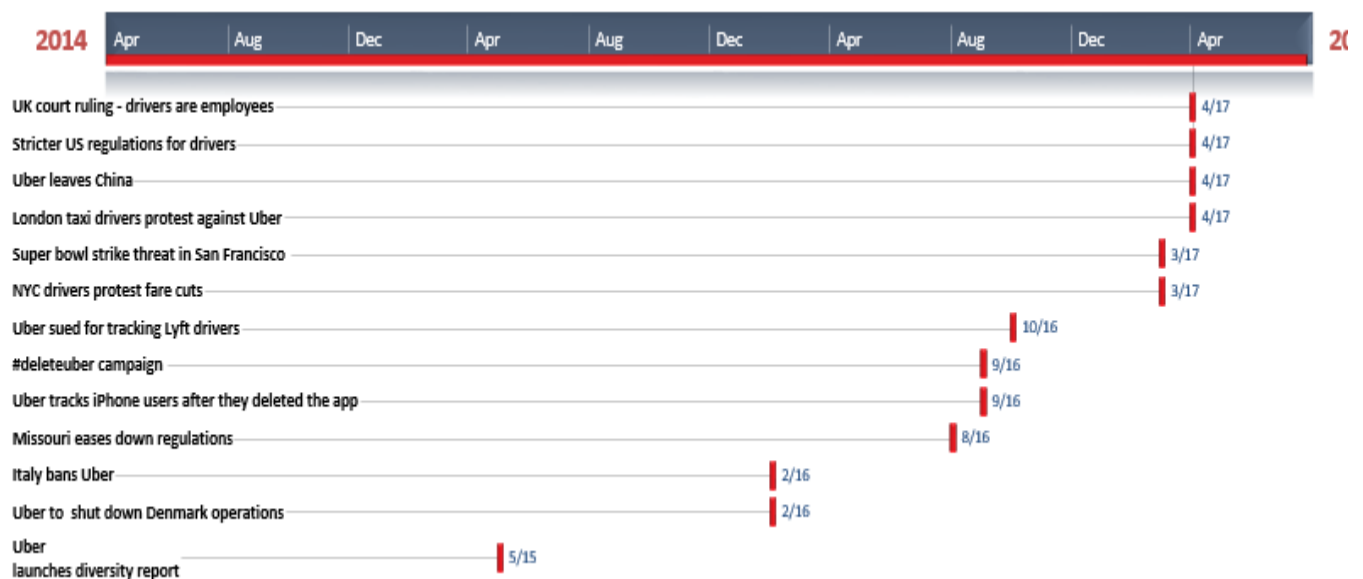
Figure 3. Model Estimation Workflow



4. Findings

We begin this section by providing an overview of some of the key Uber events, in the period from 2014 to 2017, which corresponds to the time period of this study. Figure 4 shows these events in the order from the most to the least current, providing a point of reference for the subsequent sub-sections. First, we give an overview of the findings by highlighting the overall results that emerged from the data, and second, we focus on every organizing problem separately: task division, task allocation, information provision, and reward provision, in order to offer more analytical depth.

Figure 4. Key Uber events, April 2014 – February 2017



4.1 Overview of the findings

The analysis showed that 70% of all the topics (21 topics) that emerged from the data extensively discussed the four universal problems of organizing: task division, task allocation, reward provision, and information provision, which are equivalent to the aggregate dimensions in Table 1. These 21 topics were the focus of the analysis, considering that this study is particularly concerned with workers' perspective in regards to the new forms of organizing; therefore, the other 9 topics were omitted from the further analysis for various reasons¹.

After the topics were grouped by first order themes, second order themes and aggregate dimensions (see Table 1) (see section 3.3.2 for the elaboration on analytical procedures), it became evident that overall, topics could be clustered by those that contest Uber's organizing solutions, or "contestation topics", and those that speak of them in a neutral manner, or "neutral topics" (underlined second-order themes in Table 1 represent the contestation topics, whereas the rest represent neutral topics). For instance, both topic 15 and topic 10 fall under the second-order theme "frustration/miss-allocation", and contain words and documents that speak of Uber's organizing problems, in this case task allocation, with frustration, dissatisfaction, or disagreement, essentially contesting this organizing problem. On the other hand, topics 1 and 2 fall under the second-order theme "best times and places", and they do not assign blame or criticize the organizing problems but rather discuss them for the purpose of advice giving and/or advice seeking, hence I refer to them as "neutral topics" (for the detailed analytical procedures please refer to section 3.3.2). This simplification of the grouping is useful as the contestation topics can be seen to represent the lack of legitimation of the organizing problem in question, whereas the neutral topics show the absence of contestation and possible acceptance of organizing solutions.

In total, 42 percent of all the word assignments belonged to contestation topics, whereas 39 percent belonged to neutral topics (see Table 2) (the rest of the assigned words belonged to 9 topics that were excluded from the further analysis). Drivers contested all the organizing problems besides information provision, for which the neutral topics significantly overshadowed the contestation topics (see Table 2). Reward provision (e.g. topics that speak of promotions, earnings) was the most contested topic, with 17% of words assigned to this organizing problem, whereas information provision (e.g. topics that speak of traffic, car rentals, support services) was the only organizing problem in which the neutral topics where

¹ Out of other 30% of the topics, or 9 in total, 7 (topics: 25, 26, 30, 18, 14, 7, and 6) were not semantically

discussed more than the contestation topics, accounting for the total of 21% of word assignments.

Table 1. Topics according to themes

Topic ID	Top probability words	First-order theme	Second-order theme	Aggregate dimension
12	uber, driver, lyft, passeng, mani, platform, line, news, market, allow	Recruitment	<u>Recruitment</u>	Task division
1	new, citi, nyc, view, york, chicago, houston, attach, jersey, francisco	Events	Best times and places	Task allocation
22	drive, day, work, time, night, last, good, hour, start, week	Times and days		
15	pax, get, pick, wait, got, minut, call, drop, back, away	Rides	<u>Frustration/</u> <u>Miss-allocation</u>	
10	surg, ping, area, see, get, time, onlin, show, sit, zone	Surge		
3	use, sign, share, free, offer, might, thought, can, cash, give	Promotions	Compensation	Reward provision
20	hour, week, pay, mile, per, earn, guarante, fare, total, tax	Earnings		
5	rate, will, price, less, star, cut, low, make, increas, lower	Unfair ratings	<u>Unfair rewards</u>	
24	dont, like, get, just, tip, peopl, know, make, realli, want	Tips		
27	ride, trip, rider, request, accept, cancel, fare, pool, time, minut	Unfair compensation		
2	said, told, report, passeng, polic, ticket, offic, ask, cop, fine	Crime	Advices/news	Information provision
4	airport, area, live, counti, san, south, north, lax, west, beach	Traffic		
8	plus, return, rent, book, rental, orlando, car, grab, day, month	Car rentals		
13	park, street, road, traffic, lot, will, block, side, deliveri, spot	Traffic restrictions		
17	compani, servic, said, transport, oper, will, busi, uber, provid, employe	Lawsuit		
19	can, stupid, safe, car, record,	Safety		

	rule, one, idiot, caus, control		
21	car, vehicl, insur, drive, year, will, licens, month, cover, need	License/Insuran ce	
23	app, phone, use, updat, set, map, screen, googl, tri, iphon	Navigation	
29	taxi, uberx, cab, black, select, servic, hire, suv, uber, busi	Luxury vehicles	
9	email, receiv, check, uber, account, support, say, issu, messag, send	Support services	<u>Frustration/Miss- information</u>
28	anyon, just, got, today, els, know, ive, notic, wonder, happen	App use	

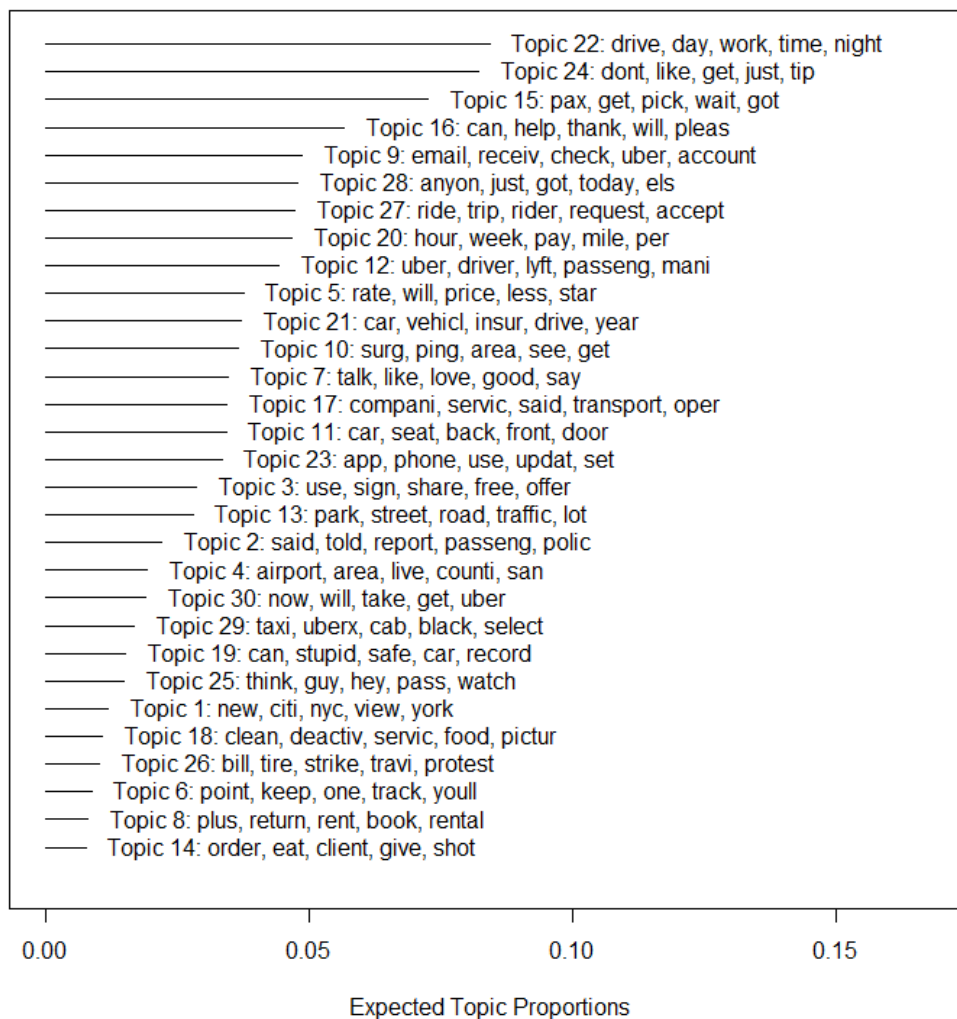
Note: The underlined topics represent contestation topics, whereas the other topics represent neutral topics. Topics: 25, 26, 30, 18, 14, 7, and 6 were not labeled due to low semantic coherence score or representation of very mundane words such as need, can, get etc. while topics: 11 and 16, are not in the table as they did not fall clearly within any of the four categories.

Table 2. Percentage of word assignments

Organizing problem	Percentage of word assignment	
	Contested topics	Neutral topics
Task division	4.4	
Task allocation	10.92	9.61
Reward provision	16.69	7.54
Information provision	9.66	21.45
Total	41.67	38.6

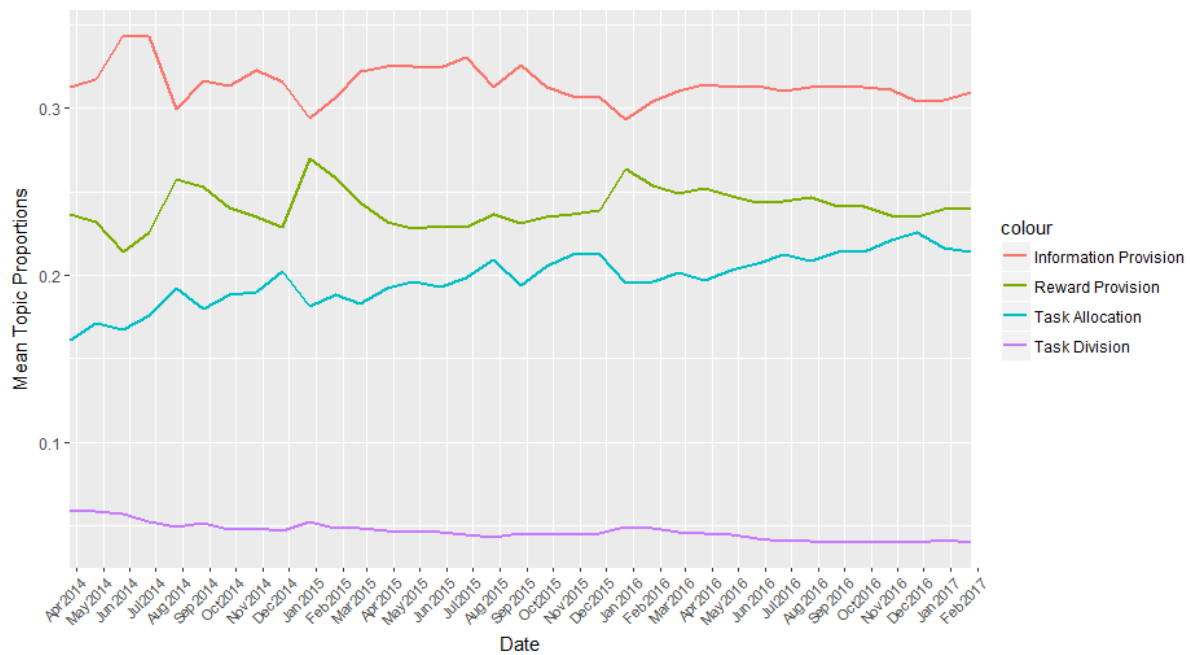
Figure 4 shows topics in order by the amount of space they take up in the text corpus and their corresponding five highest probability words. As expected, topics that discuss “times and days” of driving (topic 22), “tips” (topic 24), “rides” (topic 15), and “support services” (topic 9), were amongst the most discussed ones. Each topic and the resultant theme can be seen as a frame (DiMaggio et al., 2013), since they draw attention to the ways that cause contestation (or not) of organizing problems. The presence or lack of contestation is interpreted in terms of positive or negative evaluation – i.e., the legitimization, of organizing problems.

Figure 4. Top Topics



In order to analyze the shift in frames and framing over time, we aggregated the percentage of all words that belong to each one of the organizing problems. The results show that information provision was discussed the most by drivers, whereas task division was discussed the least, which persisted over time (see Figure 5). Figure 5 shows that information provision and reward provision were discussed with a relative consistency over time. On the other hand, task allocation shows an upward-time trend, whereas task division shows a downward-time trend. In the subsequent sections, we discuss each one of the organizing problems separately in order to provide more analytical depth.

Figure 5. Organizing problems over time



4.2 Task division

The findings reveal that task division was of the least importance to drivers. This organizing problem took the least proportion in the corpus, with only 4.4% of the words being assigned to it. The main topic and the corresponding theme was recruitment of drivers. The reason for its low representation could be the fact that task division is mostly handled by authority figures within the company before the tasks are even allocated, hence the drivers have little influence over it. My subsequent qualitative analysis showed that drivers spoke of the way tasks are divided in a negative way, contesting the way Uber handles it. For instance, one driver said:

There's too many damn drivers. Uber x drivers need to tell Uber to stop hiring drivers the way Uber black drivers did, but then, again, Uber black drivers are smarter and more organized, that's why Uber won't hire any more Uber black drivers, because drivers protested (kc0433, January 2017)².

Uber has different requirements for UberBLACK drivers and uberX drivers, with the former needing to be part of an existing limousine fleet or privately own one, whereas uberX drivers pick up passengers with their own vehicles, thus they are usually not professional drivers

² kc0433 refers to the nickname of the forum user, and January 2017 is the date when the post was made by the user. The subsequent posts follow the same format. Some posts are missing the drivers' nickname due to it being hidden by the driver. Some of the quotes were slightly edited here in order to improve readability.

(UberBLACK vs. uberX, 2017). The example above shows a disagreement in regards to the recruitment of drivers, which is the second-order theme of this organizing problem.

Our findings reveal that task division was discussed significantly less over time (see Figure 6.). Figure 6 also shows that workers discussed task division the most in April 2014 and the least in February 2017, pointing to the fact that legitimation of this organizing problem declined over time. A representative post from April 2014 says:

Uber offers \$200-\$300 for new UberX drivers. That costs them \$500-\$600. Hmmm that's 50-60 weeks of 'mobile subscription fee'. I think they might be looking at the long term picture. That with those new driver referrals, they get the new driver telling everyone they know about the service. It's marketing. Also they must be thinking that those that will stick with them as drivers long-term are stuck doing so financially, and pay cuts won't change their need for the job (jakeV, April 2014).

On the other hand, a post from February 2017, when task division was discussed the least, reads:

This #deleteuber campaign has been rather effective in hurting Uber right where it counts-Loss of Riders & Drivers...The calls to delete Uber appear to be working at least temporarily. Many of those deleting their Uber accounts stated they would only use Lyft...One former Uber user said he hadn't used Lyft until today, but the company's decision to donate \$1 million to the American Civil Liberties Union convinced him to delete Uber...Most, if not all of us drive for Lyft, as well as Uber. Turn on your Lyft App more and if the conversation goes to Uber, let the Lyft passenger/s know how Uber treats you...

From these two most representative posts from two different periods, we can see that in April 2014, in early stages of the forum's existence, drivers were discussing the monetary incentives for joining Uber. Evidently, they were speculating about the reasons behind these incentives and Uber's long-term strategy. However, over time, drivers learned more about Uber, hence information about the ways Uber handles this organizing problem became less important, but also, drivers spoke more negatively about it over time. Post from February 2017 is a direct response to the #deleteuber campaign. Reportedly, while taxi drivers in New York stopped their services in solidarity with those who protested Trump's immigration ban, Uber was trying to profit by turning off surge pricing (Isaac, 2017). The New York Times reported that as a result, half a million Uber drivers requested to delete the Uber app (Isaac, 2017). Therefore, it appears that in early 2014 drivers were discussing task division extensively in order to acquire information, hence they were not contesting Uber's solutions

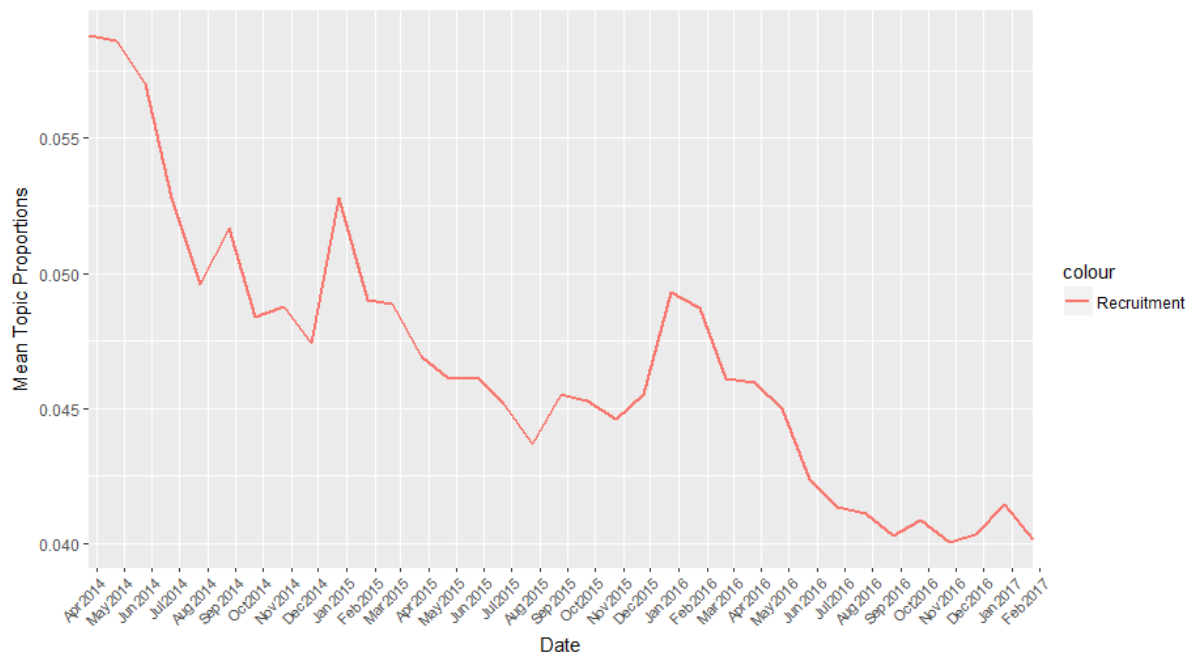
to this organizing problem. However, as they learned more about the organization, a number of recruited drivers requested to stop their services for the company that apparently does not match their expectations, in this case in terms of values and principles. In the latter post we see that the driver explicitly advises his fellow drivers to switch to Lyft or at least inform their passengers about the way Uber treats them. This clearly points to the fact that drivers do not approve of Uber's operations, and thus do not legitimize the solutions to this organizing problem.

Additionally, framing appears to shift as a response to prominent events in the media, which speaks of drivers' agency and involvement in the matters of Uber. For instance, in January 2015, Uber decided to cut rates, making it cheaper for passengers to take a ride ("Beating the Winter Slump," 2015). The analysis shows that drivers actively responded to this, and in this case by contesting the solution to this organizing problem. For instance, one driver commented:

it's clear what uber is trying to do - crush Lyft. By lowering rates, ridership and demand will increase stemming from their base as well as new riders. However, drivers will flock to lyft, whose rates are higher and there is a loyal base there as well. To put a stop gap to that, uber implemented guarantees whose perks and requirements pretty much ensure that drivers do not quit or drive less due to the low rates....so basically the uber driver must be online consistently and accepting pings only from uber...I'm sure uber's lyft killing team brainstormed this out beautifully in their heads...(UberOne, January 2015)

This post also shows that drivers are more confident of their knowledge concerning the company's operations. The post from 2014 read "I think..." whereas the above-quoted post is endowed with more confidentiality, with the starting line being "it's clear what uber is trying to do...". In the post from January 2015 in the driver's sarcastic way of expressing we can see the disagreement with Uber's recruitment strategy. In today's world, it is quite common to want to outcompete others and gain market share, but apparently, the approach to it matters to drivers; evidently, drivers do not appreciate what appears to them as "tricks" to keep them driving longer, take advantage of guarantees, and destroy the competitor. In the subsequent analysis we will see that drivers also discuss this particular event of rate cuts in January 2015 in the context of other organizing problems such as reward provision, which shows their interrelatedness.

Figure 6. Task division over time



4.3 Task allocation

Task allocation consists of two second-order themes: compensation and unfair rewards (see Table 1). The former theme refers to neutral topics whereas the latter represents contestation topics. Workers extensively discussed task allocation, with 4 out of 21 topics belonging to this category, which accounted for 20.53 percent of word assignments. Topic 22 (first-order theme: times and days), which, as mentioned, took up the most space in the entire corpus, belongs to this organizing problem. This neutral topic is characterized by discussions in which drivers seek advice and inform one another of the best times to drive. For instance, one driver posted:

I pretty much decided for the most part that it's no longer worth working these days since it's pretty dead after 5pm and i have a day job...but i need to make a little extra this worth it? (Schuber, March 2016)

Topic 1, within the same second-order theme, is more focused on events that can earn drivers a better wage. For instance:

Ok, Since everyone is complaining how quiet it is, here are some events to help you out this week to make some money. Thursday 12th Jan 2017 Club Swizzle Opera House 8:00pm - 10:00pm. Ladies in Black Lyric theatre 8:00pm-10:35pm... (Mulder99, January 2017).

These two topics speak of the entrepreneurial spirit of the drivers, who notably want to maximize their chances for earnings by giving advices to one another about the best times

and places to drive. It also emphasizes the need to improve the solution to this organizing problem, which is mainly directed by an app which informs drivers of their next ride. Drivers therefore compliment Uber's solution by introducing direct communication among the drivers. Topic 15, on the other hand, with its first-order theme "rides" and the second-order theme "frustration/miss-allocation", is a representative of contestation topics. While topic 1 and 22 can be seen more as "advice giving" and "advice seeking", topic 15 emphasizes the frustration with wait times, difficulty of handling problems with passengers, and the location of tasks. For instance, one driver commented:

*I got a ping at my house. 30 seconds later I'm in the car driving to pick up the pax [passenger]. Suddenly I get a call from the pax [passenger] and he sounds irritated. He asked am I on my way yet and tells me he's been waiting for 15 minutes already. I tell him I got the ride request 2 minutes earlier. He argues and tells me to hurry up and get my slow a** to his house. CANCEL (Reversoul, February 2016)!*

From this example, we see that drivers also make decisions as entrepreneurs. If this driver consulted Uber, the company would likely tell him to cater to his client, but because the passenger was rude, the driver decided to cancel the ride, which is more based on the principle than material gain. Topic 10, within the same theme and a contestation topic, too, shows that drivers are not particularly satisfied with the authority that assigns the tasks, in this case the Uber app.

These pings that are 10+ mins away are getting way too ridiculous. I had 8 pings this morning within 3mins. Ping ping ping ping ping ping ping ping! All 10 mins or above. Longest was 17 mins! Lol I accepted 1 and then cancelled the others...Ridiculous (Jshawkat, December 2016).

Therefore, we have two forces operating: on one hand, we have the app run by an organization that assigns the tasks, and on the other, we have drivers who found their own solution to this organizing problem and that is to inform one another of the best places and times to drive. Overall, contestation topics claimed 10.92 percent of word assignments, while 9.61 percent of words were assigned to neutral topics. Since the difference is small, we cannot strongly claim that task allocation is not legitimated by the drivers. However, from looking at neutral topics, it appears that drivers are dedicating more time to finding their own solution to task allocation vs. praising the company for its efforts.

The findings show that, over time, contestation topics were given more attention than neutral topics (see Figure 5.), hence legitimation when down over time. For instance, from April 2014 until January 2015, neutral topics were discussed more and supposedly because

Uber was still relatively new so drivers were in need of more information. A representative post from this time period reads:

Just curious. I see the red surge bar come up on occasion, but I have never had a surge fare. The red bar along the bottom of the map says "surge pricing" but there has never been a multiplier like I hear about all over this board (Courageous, November 2014).

However, from January 2015 contestation topics took the foothold, while the neutral topics remained relatively stable over time. Moreover, over time we see that spikes in discussions of contestation topics mirror the spikes in discussions of neutral topics (see Figure 7). For instance, in August 2015, a contestation topic read:

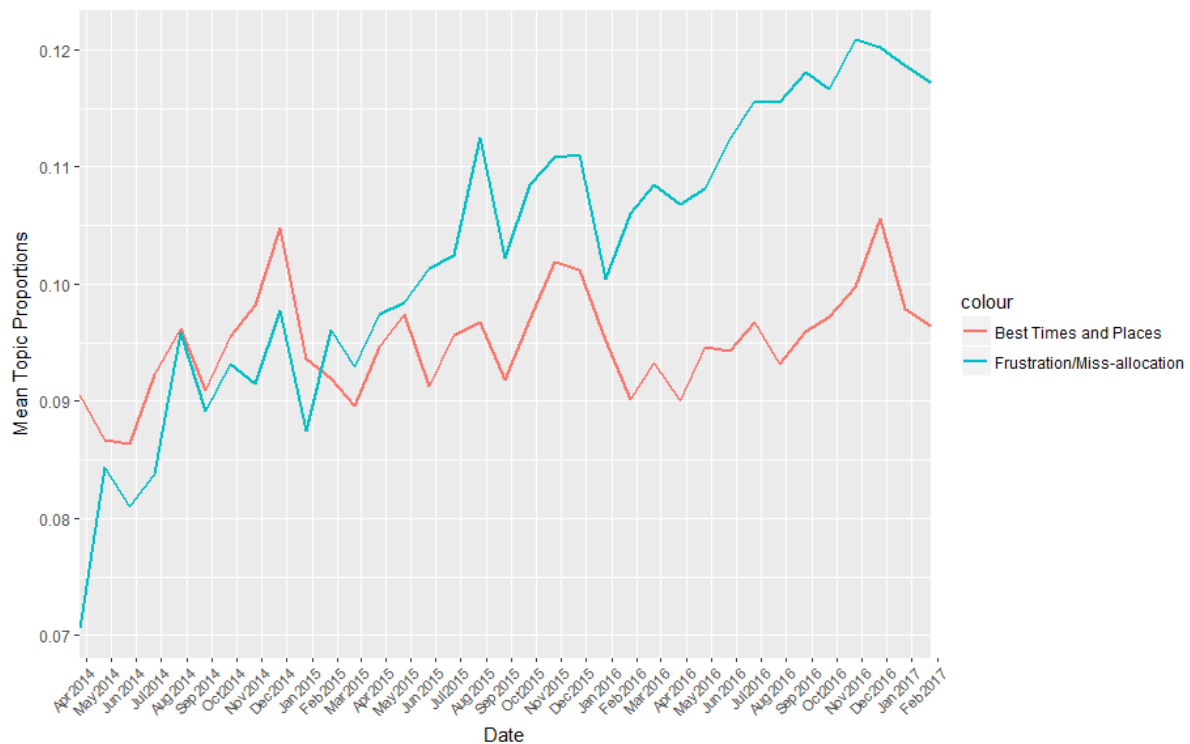
So, am I the only one that showed up to the concert and waited 45 min and never saw ONE RED SHADE ON THAT APP?! Not one! I am still pissed!! I've never had a concert not surge at the end. Have you (docswife, August 2015)?

A neutral topic from the same time period read:

So I usually drive from midnight till 4am but since I am greedy and want to make a little bit more money, I decided to drive an extra hour in the afternoon. Wasnt too bad...(August 2015).

Therefore, as with task division, it appears that at the beginning of the forum's existence, in 2014, drivers had limited information about Uber and its operations, hence they were extensively discussing how Uber allocates tasks. However, as they learned more and gained more experience, they realized that the company, or the app, is not very efficient so they began to partially solve this organizing problem themselves. As a result, we see that the more drivers contest a topic, the more they seek advice within the same time period. This indicates that over time, drivers contested this organizing problem more.

Figure 7. Task allocation over time



4.3 Reward provision

After information provision, reward provision emerged as the second most important theme, claiming 24.23 percent of word assignments. This does not come as a surprise considering that earnings of platform workers, as well as ratings and tips of the drivers, have been extensively discussed in the media, and most commonly in a negative context (e.g. Lawrence, 2016, Cook, 2015). Contestation topics (“unfair ratings”, “tips”, and “unfair compensation”) that were grouped under a second-order theme “unfair rewards” (see Table 1), were contested by workers, accounting for 16.69 percent of word assignments. Workers also discussed earnings and promotions, neutral topics, which were grouped under a second-order theme ‘compensation’ (see Table 2), with 7.54 percent of word assignments being dedicated to these topics. As it emerged from the analysis, Uber drivers directly assign blame to Uber, in this way framing the issue as “Uber’s problem”. For instance, one driver noted:

FUBER adjusted one of my fares!!..Reason: Poor Route. This fare was adjusted following a report that the route taken was not optimal. We've adjusted the fare to reflect the estimated time and distance of the most efficient route between the rider's pickup location and destination...What NERVE! I disputed this! Inputs? (IUBERYoU, February 2017)

On the other hand, the neutral topics discuss “promotions” and “earnings”, giving information to other drivers about promotions that they can take advantage of, or facts about wages they make. For instance, one driver informed:

Ebay has Gas Cards on sale for Cyber Monday...you can purchase \$100 cards for Exxon, BP and Chevron for \$92... (DelaJoe, November 2016)

As evident, the above post informs drivers of the discounts on fuel. This information can be considered as “inside information”. Uber operates in many cities and knowing various promotions in regards to fuel or car wash would be impossible. Drivers, however, are local residents of their cities and they have first-hand information about such things. The fact they choose to share it with others speaks of their need to work as a team.

Over time, topics that contest reward provision as an organizing problem were discussed significantly more than topics that speak of compensation in a neutral manner (see Figure 6.). Similarly, as we have seen with task allocation, when there is a rise in discussions over contested topics, there is a rise in discussion of neutral topics as well. This seems logical because when drivers are frustrated about their tips, for instance, they are also more likely to consult with others and learn whether they are just an exception or it happens to others as well. This is particularly evident in January 2015, when we see a sudden shift in framing, accounting for almost 18 percent of all word assignments of contested topics. In this particular month, Uber decided to cut rates for riders, as already mentioned in task allocation section. Foreseeing that drivers might become worried for their wages, Uber published a press release stating that:

At Uber we're always looking for ways to deliver lower prices to riders to make Uber an everyday transportation option. In the last year, our largest cities have seen price cuts to deliver on that promise. The upside for the rider is obvious, but also important is that with the increased demand, drivers' income goes up as well, (Beating the Winter Slump, 2015)

If we now turn to the posts by drivers, we see that they directly respond to the solution to this organizing problem, but interestingly enough, by proposing an alternative. Thus, one driver commented:

I hope Uber is listening, I believe it's a better business model to cut commission than rate cut. Here are my arguments:1. Instead of rate cut, Uber should cut their commission to 10%, it gives the 10% fare cut to the riders, not the drivers....3. Without rate cut, drivers are more willing to do longer pick up, more revenues for Uber. It makes Uber more reliable too in the eyes of riders...They didn't break it

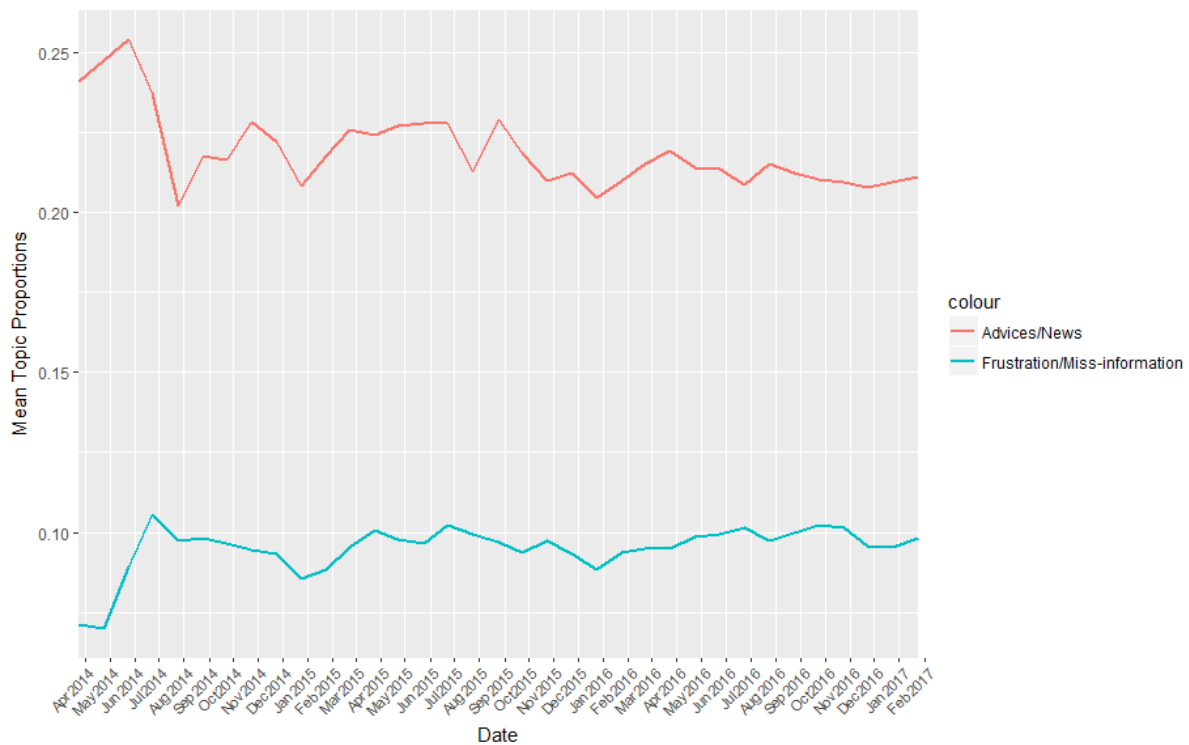
down to something more realistic such as average driver net income, or income/miles (Uzcaliber, January 2015).

If we now turn to neutral topics in January 2015, we see that drivers give advices to each other on how they can earn extra money.

They just doubled the driver referral bonus! Have friends currently driving with other ridesharing services? Share the link below and get \$500 when they sign up to drive with Uber! How it Works Find friends who were already driving for other ridesharing services before 1/8/15 Share your special referral link with as many people as you want Get \$500 after they take their first trip!... (Steve French, January 2015).

Therefore, we can conclude that in general, workers do not legitimate Uber’s solution to reward provision as an organizing problem. However, they dedicate time to informing one another of their earnings or upcoming proportions that can boost their incomes. They are also active when it comes to news and updates, and respond promptly to new organizing solutions proposed by their “employer” by either 1) voicing their disagreement, or 2) suggesting alternatives.

Figure 8. Reward provision over time



4.3 Information provision

52% of all the topics (11 out of 21) belonged to the aggregate dimension information provision, with 31% of all words assigned to this organizing problem, hence it emerges as the

most important theme. This was also the only organizing problem where neutral topics were discussed more than contestation topics. Topics belonging to information provision can be grouped by two main themes: “advices/news” and “frustration/miss-information”. The “advices/news”, or neutral topics, claimed the total of 9 out of 11 topics, accounting for 21.45 percent of word assignments (see Table 2), with the topics discussing practicalities such as traffic, safety, and navigation, but also providing news on lawsuits of Uber and Lyft, for instance (see Table 1). “Frustration/miss-information” topics, or contestation topics, claimed only 9.66 percent of word assignments and they discussed two first-order themes: “support services” and “app use”, which speak of difficulty of contacting Uber and the frustration with the app, which provides faulty information. A representative post from neutral topics reads:

Hi all, we have a Mitsubishi Lancer GLX available for rent at \$385/week with \$500 deposit. Minimum rental is one month. For short term rentals, it will be \$70/day with \$300 deposit... (BelieveMe, September 2016)

This post is from topic, which concerns information about car rentals. On the other hand, a representative post from the contestation topics says:

How do you contact Uber they only answer with a generic response but never answer all my questions. It's been 2 days and no reply to my emails... Chat support on Uber web site doesn't exist anymore so I'm clueless how to contact them (Jay Styles, April 2016)?

The difficulty of contacting Uber, which emerged from my data, is in line with NPR’s informal survey report, where 78% of surveyed drivers (688 drivers) reported they could not speak in person with Uber to get needed help (Shahani, 2017). The fact that workers explicate the difficulty of contacting Uber explains why information topics are so prominent. As it appears, drivers seek advices from one another in order to increase their chances of completing their tasks successfully, which is reflected in their ratings, and to maximize earnings, which is the main attribute of this organizing problem (Puranam et al., 2014).

Both themes remained relatively stable over time, as we can see on Figure 9, which shows conditional expectation of aggregated topic prevalence of each theme given the date. As with other organizing problems, the spikes in discussions of neutral topics, mirror the spikes in discussions of contestation topics. Although we see that over time the theme “advices/news” remained discussed significantly more than the theme “frustration/miss-information, if we look at the each topic separately over time, we get additional insights. The most discussed topics are topic 9 – “support services” and topic 28 – “app use”, which both belong to contestation topics. Therefore, although neutral information topics, take all

together, are discussed more than contestation topics, the two most prominent topics for the organizing problems are those that are contested by the drivers. The quantitative and qualitative analysis, therefore, point to the fact that drivers are particularly unhappy with the way Uber handles this organizing problem and in turn inform one another in order to handle their tasks according to expectations. This is, however, more of a sign of rebellion than acceptance of Uber’s solutions. Uber does not encourage communication among drivers and their business relies on “faceless”, app-led communication (Shahani, 2017).

Figure 9. Information provision over time

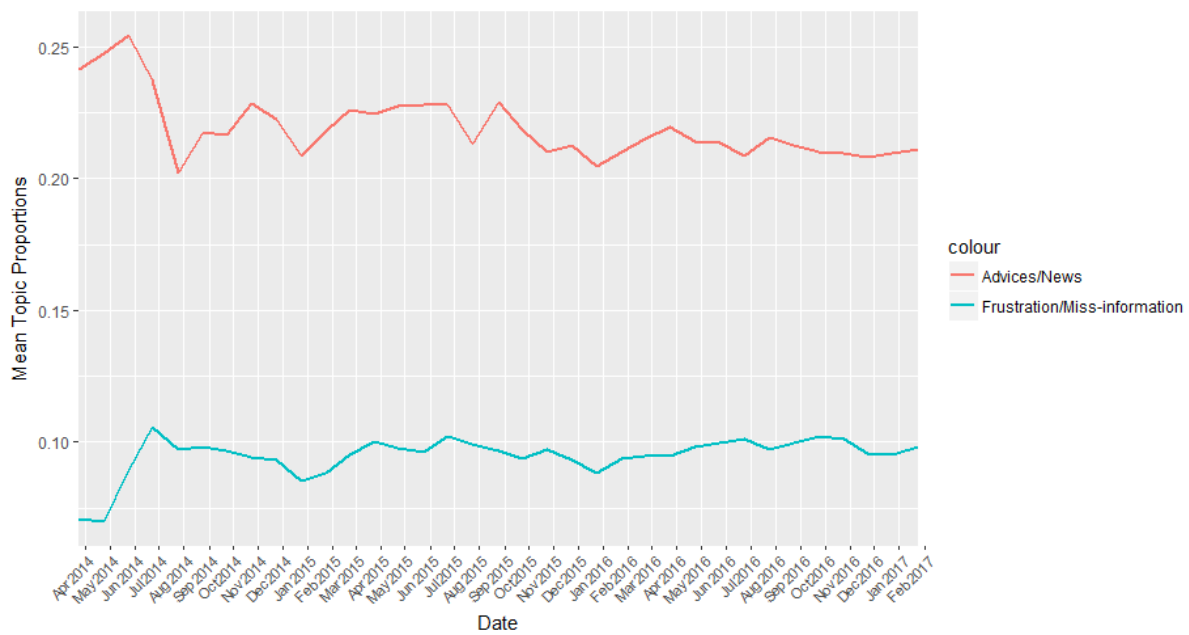
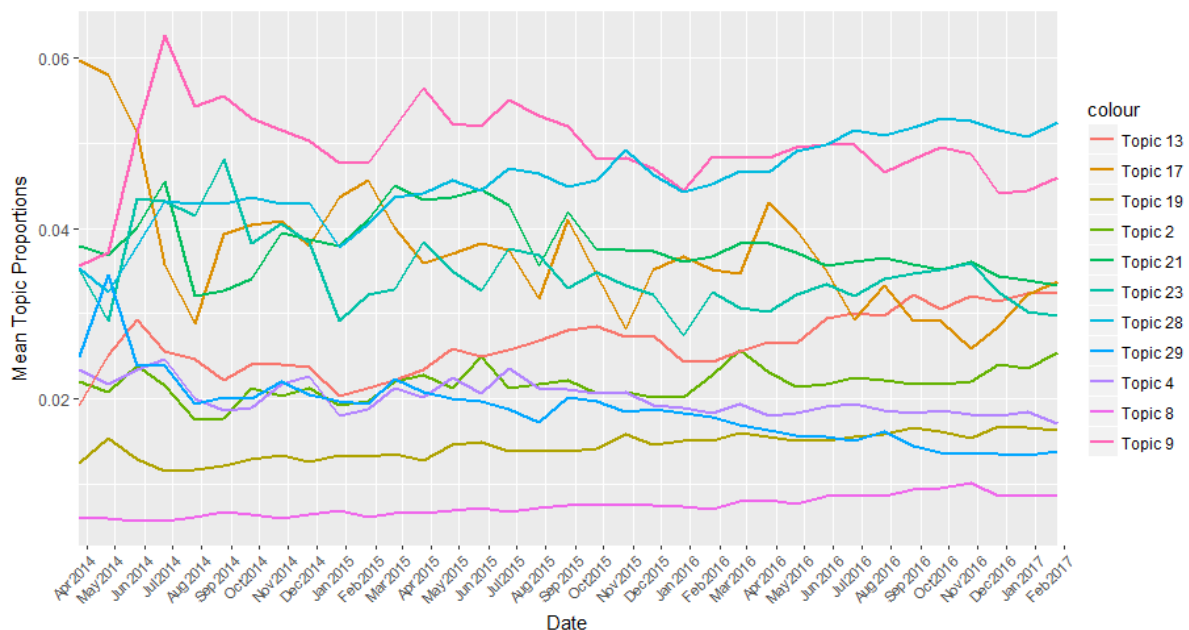


Figure 10. Proportion of each information provision topic



5. Discussion

The framing and legitimation of new organization forms continues to trigger debate in present-day theories of organizations (Hannan & Freeman, 1977; Romanelli, 1991; Hus & Hannan, 2005; Puranam et al., 2014). This paper contributes to this debate by exploring the ignored perspective of workers when it comes to the framing of novel organizing solutions pertaining to task division, task allocation, reward, provision, and information provision. Specifically, this study focused on on-demand economy and Uber as its most prominent representative, concerning itself with Uber drivers' perspective regarding the framing and the role of frames in legitimating, contesting, or offering alternative solutions to organizing problems over time. First, we proposed that novel solutions to organizing problems must be seen as legitimate by drivers in order for the organization to survive in the long run. Second, we maintained that this process of legitimation is explicated by drivers' framing of Uber's solutions. Extensive discussions of these solutions by the drivers show a clear evidence that drivers are active when it comes to framing of these solutions and not passive adopters. Moreover, drivers also proposed and implemented solutions to Uber's organizing problems, positioning them as solution crafters. Puranam et al. (2014) indicated that solutions do not have to be crafted by authority figures; my findings confirmed this. Third, framing processes were studied over a period of time, namely from April 2014 to February 2017, following the suggestion that framing is a process that evolves over time (Benford & Snow, 2000). Our findings confirmed this nature of framing empirically by demonstrating that some organizing problems were contested significantly more over time (e.g. task allocation) as workers learned more about Uber and its operations.

5.1 Research contributions and implications

This study has several important theoretical and practical implications. First, the literature on the new forms of organizing – how an organization works (Puranam et al., 2014) – and its legitimation (Hsu & Hannan, 2005), has been very fragmented, with studies either exploring one or the other. Herein, I bridged the gap between these distinct concepts by emphasizing that workers must legitimate novel solutions to organizing problems. Only after these solutions are legitimated by the workers, can we say that an organization embodies a new organizational form (Puranam et al., 2014). While scholars looked at the emergence of other organizations embodying the same form of organizing as a sign of legitimation by the organizational population (Hannan & Carroll, 1992), I showed that perspective of workers precedes this step.

Second, this study contributed to the literature on framing by advancing empirical and methodological developments. The literature extensively focused on skilled actors such as institutional entrepreneurs and top managers in influencing workers by using strategic framing (e.g. Battilana et al., 2009; Polos et al., 1998; Rao et al., 2000; Fiss & Zajac, 2006). This paper confirmed the findings of Chreim et al. (2016), who showed that workers can oppose managerial framings. In addition, this study showed that workers go a step further. When drivers found Uber's solutions to organizing problems unsatisfying, and contested them, they also responded by proposing their own. This is evidenced by the rise in contestation topics mirroring the rise in neutral topics. For instance, over time drivers found their own solutions to the information provision problem by informing one another of car rental prices, traffic on the streets, or lawsuits that Uber faces. In addition, this paper embraced topic modeling, and specifically structural topic modeling, as a new method for studying framing processes in large text corpus, as suggested by DiMaggio et al. (2013), setting the ground for future studies. The preceding scholarly contributions lead us to outline some important practical implications that organizations could take on board.

Chreim (2016) noted that resistance to managerial frames can have consequences for the organizations in terms of lower revenue. While the standard solution to this problem would be for managers to make an extra effort and align the perspective of workers who resisted the frames (Chreim, 2016), my findings propose an alternative. In the on-demand economy where workers are not tied to any single employer and there is no employment contract that binds workers to companies (Simon, 1953), managers might do much better by flattening the hierarchy and incorporating the perspective of workers, or in other words, explicitly letting them craft the organizing solutions. At the end of the day, workers are the ones that need to complete the tasks successfully and although company solutions can often be superior, the resistance of those solutions can signal inefficiency. For instance, Uber communicates with its drivers via the app but our analysis showed that this is not the most efficient way and that workers seek human contact, which was explicated by their extensive discussions and advice giving and advice seeking on the forum. This study also showed that workers are highly responsive to events in the media and actively debate the current events. Organizations need to understand the sensitivity of workers to these events and manage them adequately. For instance, when Uber drivers learned of Uber rate cuts and #deleteuber campaign, they advised others to switch to Uber's competitor Lyft. The drivers' frustration with Uber could actually make them feel closer to their fellow drivers and more reliant on them for advice and support. Uber could encourage such communication while at the same

time maintaining positive company reputation; in this way organizing problems that still do not have desirable solutions could be temporarily resolved by drivers themselves.

5.2 Study limitations and future research

Future research should explore other research settings, beyond the one employed in this study. The benefit of this study is that it explored the case of Uber - one of the most prominent businesses embodying platform capitalism, the new form of organizing in the platform economy. However, considering that Uber serves as an example of good but also bad practices, the recent businesses could have learned from this and adapted their ways. Indeed, platform cooperatives provide an interesting avenue to explore alternatives to platform capitalism (Scholz, 2016). Taking on board some of the solutions to organizing problems that Uber drivers proposed, and which emerged from this study, future studies could analyze their applicability to platform cooperatives, which are primarily led by workers.

Second, the present study concerned Uber drivers in the United States mainly, hence the generalizability of the study is constrained by the dominance of English language and the regulatory and operational constraints that could be specific to the United States. The dominance of English language on the forum could have excluded non-English speaking drivers from participation. In addition, the regulations in the United States can be considered lenient compared to the other countries (Rauch, & Schleicher, 2015), therefore, we might expect that drivers in the Netherlands, for instance, are less frustrated in regards to Uber's solutions to organizing problems as the law requires them to have licenses as regular taxi drivers. In addition, how much power organizations give to employees varies across cultures (Lewin, Long, and Carroll, 1999). Thus, workers' framing of organizing solutions could be tied to their cultural background, with the expectation that workers endowed with more power will also contest the organizing problems more due to the belief that they can trigger changes.

Finally, there are questions concerning the ability of workers to actually influence changes to the organizing solutions manifested by organizational adoption, or perhaps engage in entrepreneurship. Ansari and Phillips (2011) noted that unorganized actors such as workers can also influence field level changes, thus a study for the specific case of platform economy in which workers are independent contractors and not tied to any particular organization provides an interesting research context for future studies. Moreover, Shah and Tripsas (2007) explained the process by which community identification can lead to entrepreneurial activity, which they call "user entrepreneurship" (p. 124). Taking in account that some news

outlets ascribed the creation of alternatives to Uber run by workers – platform cooperatives to frustrated drivers (e.g. Swift), the direct link between community identification and generation of collective identity and entrepreneurship could be explored.

6. Conclusion

In this paper, we tapped into the unexplored perspective of workers about framing and legitimation of new forms of organizing in the platform economy, and specifically to platform capitalism, of which Uber is the most prominent example. We have showed that workers do not embrace the solutions to organizing problems imposed upon them, but actively discuss them, debate them, and manifest their experiences with the solutions by either contesting them or discussing them in a neutral manner. Because the perspective of workers received very limited attention in the literature, simply showing that workers do contest organizing problems and even suggest alternatives, offer significant contributions to various streams of literature.

References

- Aldrich, H. E. (1979). *Organizations and environments*. Englewood Cliffs, NJ: Prentice-Hall.
- Aldrich, H. E., & Fiol, C. M. (1994). Fools rush in? The institutional context of industry creation. *Academy of management review*, 19(4), 645-670.
- Ansari, S., & Phillips, N. (2011). Text me! New consumer practices and change in organizational fields. *Organization Science*, 22(6), 1579-1599.
- Baldwin, C. Y. (2010). When open architecture beats closed: The entrepreneurial use of architectural knowledge. <http://www.hbs.edu/research/pdf/10-063.pdf>; accessed July 1, 2017.
- Barker, J. R. (1993). Tightening the iron cage: Concertive control in self-managing teams. *Administrative science quarterly*, 408-437.
- Bartunek, J. M. (1993). The multiple cognitions and conflicts associated with second order organizational change. *Social psychology in organizations: Advances in theory and research*, 322-349.
- Bateson, G. (1972). *Steps to an ecology of mind: Collected essays in anthropology, psychiatry, evolution, and epistemology*. University of Chicago Press.
- Battilana, J., Leca, B., & Boxenbaum, E. (2009). How actors change institutions: Towards a theory of institutional entrepreneurship. *The Academy of Management Annals*, 3, 65-107.
- Bavelas, J. B., Coates, L., & Johnson, T. (2000). Listeners as co-narrators. *Journal of personality and social psychology*, 79(6), 941.
- Beating the Winter Slump — Price Cuts for Riders with Guaranteed Earnings for Drivers [Press release]. (2015, January 8). Retrieved from <https://newsroom.uber.com/beating-the-winter-slump-price-cuts-for-riders-with-guaranteed-earnings-for-drivers/>
- Benford, R. D., & Snow, D. A. (2000). Framing processes and social movements: An overview and assessment. *Annual review of sociology*, 26(1), 611-639.
- Blei, D. M. (2012). Topic modeling and digital humanities. *Journal of Digital Humanities*, 2(1), 8-11.
- Bowles, N. (2016, February 4). The uber-loneliness of the sharing economy driver. *The Guardian*.
- Burgelman, R. A. (1983). Corporate entrepreneurship and strategic management: Insights from a process study. *Management science*, 29(12), 1349-1364.
- Burton, R. M. & Obel, B. (1984). *Designing efficient organizations: Modelling and experimentation* (Vol. 7). North Holland.
- Carson, B. (2015, October 24). Why there's a good chance your Uber driver is new. *Business Insider*. Retrieved from <http://www.businessinsider.com/uber-doubles-its-drivers-in-2015-2015-10?international=true&r=US&IR=T>.
- Chandler, A. (1962) *Strategy and structure*. Cambridge, MA: M.I.T. Press.
- Cheney, G., & Tompkins, P. K. (1987). Coming to terms with organizational identification and commitment. *Communication Studies*, 38(1), 1-15.
- Chreim, S. (2006). Managerial frames and institutional discourses of change: Employee appropriation and resistance. *Organization Studies*, 27(9), 1261-1287.
- Gilbert, C. G. (2006). Change in the presence of residual fit: Can competing frames coexist?. *Organization Science*, 17(1), 150-167.
- Cook, J. (2015, February 11). Uber's internal charts show how its driver-rating system actually works. *Business Insider*. Retrieved from

- <http://uk.businessinsider.com/leaked-charts-show-how-ubers-driver-rating-system-works-2015-2?international=true&r=UK&IR=T>
- Cornelissen, J. P., & Werner, M. D. (2014). Putting framing in perspective: A review of framing and frame analysis across the management and organizational literature. *Academy of Management Annals*, 8(1), 181-235.
- Croidieu, G., & Kim, P. H. (2016). Labor of love: Amateurs and lay-expertise legitimation in the early US radio field. *Administrative Science Quarterly*, 0001839216686531.
- Daft, R. L., & Lewin, A. Y. (1993). Where are the theories for the "new" organizational forms? An editorial essay. *Organization science*, i-vi.
- Davis, G. F. (2016). Can an economy survive without corporations? Technology and robust organizational alternatives. *The Academy of Management Perspectives*, 30(2), 129-140.
- Dijksterhuis, M. S., Van den Bosch, F. A., & Volberda, H. W. (1999). Where do new organizational forms come from? Management logics as a source of coevolution. *Organization Science*, 10(5), 569-582.
- DiMaggio, Paul, Manish Nag, and David Blei. "Exploiting affinities between topic modeling and the sociological perspective on culture: Application to newspaper coverage of US government arts funding." *Poetics* 41.6 (2013): 570-606.
- Fabo, B., Karanovic, J., & Dukova, K. (2017). In search of an adequate European policy response to the platform economy. *Transfer: European Review of Labour and Research*, 1024258916688861.
- Frenken, K. (2017). Political Economies and Environmental Futures for the Sharing Economy (No. 17-01). Utrecht University, Department of Innovation Studies.
- Frenken, K., Schor, J., Putting the sharing economy into perspective. *Environ. Innovation Soc. Transitions* (2017), <http://dx.doi.org/10.1016/j.eist.2017.01.003>.
- Gelman, A., Carlin, J. B., Stern, H. S., Dunson, D. B., Vehtari, A., & Rubin, D. B. (2014). *Bayesian data analysis* (Vol. 2). Boca Raton, FL: CRC press.
- Gioia, D. A., Corley, K. G., & Hamilton, A. L. (2013). Seeking qualitative rigor in inductive research: Notes on the Gioia methodology. *Organizational Research Methods*, 16(1), 15-31.
- Goffman, E. (1974). *Frame analysis: An essay on the organization of experience*. Harvard University Press.
- Greenwood, R., & Miller, D. 2010. Tackling design anew: Getting back to the heart of organizational theory. *Academy of Management Perspectives*, 24(4): 78-88.
- Hall, D., Jurafsky, D., & Manning, C. D. (2008, October). Studying the history of ideas using topic models. In *Proceedings of the conference on empirical methods in natural language processing* (pp. 363-371). Association for Computational Linguistics.
- Hannan, M. T., & Carroll, G. R. (1992). *Dynamics of organizational populations: Density, legitimation, and competition*. Oxford University Press.
- Hardy, C. (2004). Scaling up and bearing down in discourse analysis: Questions regarding textual agencies and their context. *Organization*, 11(3), 415-425.
- Hargadon, A. B., & Bechky, B. A. (2006). When collections of creatives become creative collectives: A field study of problem solving at work. *Organization Science*, 17(4), 484-500.
- Fairhurst, G. T., & Sarr, R. A. (1996). *The art of framing: Managing the language of leadership* (Vol. 50). Jossey-Bass.
- Fiss, P. C., & Zajac, E. J. (2006). The symbolic management of strategic change: Sensegiving via framing and decoupling. *Academy of Management Journal*, 49(6), 1173-1193.
- Hannan, M. T., & Freeman, J. (1977). The population ecology of organizations. *American journal of sociology*, 82(5), 929-964.

- Hannan, M. T., & Freeman, J. (1986, December). Where do organizational forms come from?. In *Sociological forum* (Vol. 1, No. 1, pp. 50-72). Kluwer Academic Publishers.
- Hargadon, A. B., & Bechky, B. A. (2006). When collections of creatives become creative collectives: A field study of problem solving at work. *Organization Science*, 17(4), 484-500.
- Hartmans, A., & McAlone, N. (2016, August 1). The story of how Travis Kalanick built Uber into the most feared and valuable startup in the world. *Business Insider*. Retrieved from <http://www.businessinsider.com/ubers-history?international=true&r=US&IR=T>
- Heath, C., & Staudenmayer, N. (2000). Coordination neglect: How lay theories of organizing complicate coordination in organizations. *Research in organizational behavior*, 22, 153-191.
- Hsu, G., & Hannan, M. T. (2005). Identities, genres, and organizational forms. *Organization Science*, 16(5), 474-490.
- Huber, G. P. (2016). Changes in the structures of US companies: action implications for executives and researchers. *Journal of Organization Design*, 5(1), 8.
- Kiberd, R. (2016, May 27). Newbie Drivers Meet Embittered Veterans on the UberPeople Forum [Blog post]. Retrieved from Motherboard website: https://motherboard.vice.com/en_us/article/pgkk7b/newbie-drivers-meet-embittered-veterans-on-the-uberpeople-forum
- Eisenmann, T., Parker, G., & Van Alstyne, M. W. (2006). Strategies for two-sided markets. *Harvard business review*, 84(10), 92.
- European Commission (2016) A European agenda for the collaborative economy. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, COM(2016) 356 final, 2 June 2016, Brussels.
- Kaplan, S. (2008). Framing contests: Strategy making under uncertainty. *Organization Science*, 19(5), 729-752.
- Kaplan, S., & Tripsas, M. (2008). Thinking about technology: Applying a cognitive lens to technical change. *Research Policy*, 37(5), 790-805.
- Kaplan, S., & Vakili, K. (2015). The double-edged sword of recombination in breakthrough innovation. *Strategic Management Journal*, 36(10), 1435-
- Katz, M. L., & Shapiro, C. (1985). Network externalities, competition, and compatibility. *The American economic review*, 75(3), 424-440.
- Kenney, M., & Zysman, J. (2016). The rise of the platform economy. *Issues in Science and Technology*, 32(3), 61.
- Kiberd, R. (2016, May 27). Newbie Drivers Meet Embittered Veterans on the UberPeople Forum. Motherboard. Retrieved from https://motherboard.vice.com/en_us/article/pgkk7b/newbie-drivers-meet-embittered-veterans-on-the-uberpeople-forum
- Krippendorff, K. (2004). *Content analysis: An introduction to its methodology*. Sage.
- Kuhn, T. S. (1962/1996). *The Structure of Scientific Revolutions*. University of Chicago Press: Chicago, IL.
- Lashinsky, A. L. (2017, May 18). What Could Take Down Uber? *Fortune*. Retrieved from <http://fortune.com/2017/05/18/uber-travis-kalanick-woes/>.
- Lawrence, F. (2016, December 9). Uber is treating its drivers as sweated labour, says report. *The guardian*. Retrieved from <https://www.theguardian.com/technology/2016/dec/09/uber-drivers-report-sweated-labour-minimum-wage>

- Loewenstein, J., Ocasio, W., & Jones, C. (2012). Vocabularies and vocabulary structure: A new approach linking categories, practices, and institutions. *Academy of Management Annals*, 6(1), 41-86.
- March, J. G., & Simon, H. A. 1993. Introduction to the second edition. In J. G. March & H. A. Simon (Eds.), *Organizations* (2nd ed.): 1–19. New York: Wiley.
- McKelvey, B. (1982). *Organizational systematics--taxonomy, evolution, classification*. Univ of California Press.
- Miller, D., Greenwood, R., & Prakash, R. (2009). What happened to organization theory?. *Journal of Management Inquiry*, 18(4), 273-279.
- Mohr, J. W. (1998). Measuring meaning structures. *Annual review of sociology*, 24(1), 345-370.
- Morgan, G., Frost, P. J., & Pondy, L. R. (1983). Organizational symbolism. *Organizational symbolism*, 3, 35.
- Nambisan, S., Lyytinen, K., Majchrzak, A., & Song, M. (2017). Digital Innovation Management: Reinventing Innovation Management Research in a Digital World. *MIS Quarterly*, 41(1).
- Oliver, C. (1992). The antecedents of deinstitutionalization. *Organization studies*, 13(4), 563-588.
- Polos, L., G. Carroll, M. Hannan, G. Pell. 1998. Forms and identities: on the structure of organizational forms. Paper presented at the EGOS 14th Colloquium, *Stretching the Boundaries of Organization Studies into the Next Millennium*, Maastricht, The Netherlands.
- Palmer, I., & Dunford, R. (1996). Reframing and organizational action: The unexplored link. *Journal of Organizational Change Management*, 9(6), 12-25.
- Puranam, P., Alexy, O., & Reitzig, M. (2014). What's "new" about new forms of organizing?. *Academy of Management Review*, 39(2), 162-180.
- Rauch, D. E., & Schleicher, D. (2015). Like Uber, but for local government law: the future of local regulation of the sharing economy. *Ohio St. LJ*, 76, 901.
- Reich, J., Tingley, D. H., Leder-Luis, J., Roberts, M. E., & Stewart, B. (2014). Computer-assisted reading and discovery for student generated text in massive open online courses.
- Rao, H., & Kenney, M. (2008). New forms as settlements. *The Sage handbook of organizational institutionalism*, 352-370.
- Rao, H., Morrill, C., & Zald, M. N. (2000). Power plays: How social movements and collective action create new organizational forms. *Research in organizational behavior*, 22, 237-281.
- Roberts, M. E., Stewart, B. M., & Airoidi, E. M. (2016). A model of text for experimentation in the social sciences. *Journal of the American Statistical Association*, 111(515), 988-1003.
- Roberts, M. E., Stewart, B. M., Tingley, D., Lucas, C., Leder-Luis, J., Gadarian, S. K., & Rand, D. G. (2014). Structural Topic Models for Open-Ended Survey Responses. *American Journal of Political Science*, 58(4), 1064-1082.
- Rochet, J. C., & Tirole, J. (2004). Two-sided markets: an overview. Institut d'Economie Industrielle working paper.
- Rogers, B. (2015). The social costs of Uber. *University of Chicago Law Review Dialogue*, 82, 85.
- Romanelli, E. (1991). The evolution of new organizational forms. *Annual review of sociology*, 17(1), 79-103.
- Scholz, T. (2016). Platform cooperativism. Challenging the corporate sharing economy. New York, NY: Rosa Luxemburg Foundation.

- Shah, S. K. (2006). Motivation, governance, and the viability of hybrid forms in open source software development. *Management science*, 52(7), 1000-1014.
- Shah, S. K., & Tripsas, M. (2007). The accidental entrepreneur: The emergent and collective process of user entrepreneurship. *Strategic Entrepreneurship Journal*, 1(1-2), 123-140.
- Shah, S. K., & Tripsas, M. (2007). The accidental entrepreneur: The emergent and collective process of user entrepreneurship. *Strategic Entrepreneurship Journal*, 1(1□2), 123-140.
- Shahani, A. (2017, June 9). The Faceless Boss: A Look Into The Uber Driver Workplace. NPR. Retrieved from <http://www.npr.org/sections/alltechconsidered/2017/06/09/531642304/the-faceless-boss-a-look-into-the-uber-driver-workplace>
- Simon, H. A. (1951). A formal theory of the employment relationship. *Econometrica*, 19: 293–305.
- Simon, H. A. (1953). Birth of an organization: The economic cooperation administration. *Public Administration Review*, 13(4), 227-236.
- Simon, H. A. (1955). A behavioral model of rational choice. *The quarterly journal of economics*, 69(1), 99-118.
- Snow, D. A., & Benford, R. D. (1988). Ideology, frame resonance, and participant mobilization. *International social movement research*, 1(1), 197-217.
- Snow, D. A., & Benford, R. D. (1992). Master frames and cycles of protest. *Frontiers in social movement theory*, 133, 155.
- Snow, D. A., Rochford Jr, E. B., Worden, S. K., & Benford, R. D. (1986). Frame alignment processes, micromobilization, and movement participation. *American sociological review*, 464-481.
- Solon, O. (2017, June 7). Uber fires more than 20 employees after sexual harassment investigation. *The guardian*. Retrieved from <https://www.theguardian.com/technology/2017/jun/06/uber-fires-employees-sexual-harassment-investigation>
- Suchman, M. C. (1995). Managing legitimacy: Strategic and institutional approaches. *Academy of management review*, 20(3), 571-610.
- Sundararajan, A. (2014). What Airbnb gets about culture that Uber doesn't. *Harvard Business Review*.
- Swaminathan, A., & Wade, J. B. (1999, August). Social Movement Theory and the Evolution of New Organizational Form. In *Academy of Management Proceedings* (Vol. 1999, No. 1, pp. 11-16). Academy of Management.
- Tushman, M., & Nadler, D. (1986). Organizing for innovation. *California management review*, 28(3), 74-92.
- UberBLACK vs. uberX. (2017). Retrieved July 13, 2017, from Uber website: <https://drive.uber.com/in/uberblack-vs-uberx/>.
- Van Alstyne, M. W., Parker, G. G., & Choudary, S. P. (2016). Pipelines, Platforms, and the New Rules of Strategy. *HARVARD BUSINESS REVIEW*, 94(4), 54-+.
- Von Hippel, E. V. (2007). The sources of innovation. In *Das Summa Summarum des Management* (pp. 111-120). Gabler.
- Von Hippel, E. V., & von Krogh, G. V. (2003). Open source software and the “private-collective” innovation model: Issues for organization science. *Organization science*, 14(2), 209-223.
- Wallach, H. M. (2006, June). Topic modeling: beyond bag-of-words. In *Proceedings of the 23rd international conference on Machine learning* (pp. 977-984). ACM.
- Weick, K. E. (1969). *The psychology of organizing*. Reading, MA: Addison-Wesley.

Zuckerman, E. W. 1999. The categorical imperative: Securities analysts and the legitimacy discount. *Amer. J. Sociology* 104 1398–1438.

Appendix: Semantic coherence and exclusivity

I follow the suggestion of Roberts et al. (2014) to use semantic coherence and exclusivity criteria in order to address the internal consistency of the topic. However, with semantic coherence it is not possible to address whether the concept captures all of the perception of workers regarding Uber’s organizing problems. Therefore, I compliment this measure with the measure of exclusivity. “If words with high probability under topic *i* have low probabilities under other topics, then we say that topic *i* is exclusive” (Roberts et al., 2014, p. 7). A topic that is both cohesive and exclusive is more likely to be semantically useful. Figure 11 shows the semantic coherence and exclusivity score for the estimated 30 topics. The lower the semantic coherence, the higher the internal consistency. On the other hand, the higher the exclusivity score, the more exclusive are the words to that particular topic. Topics that are both semantically coherent and exclusive, are likely to be more “semantically useful” (Roberts et al., 2014, p. 7).

Figure 11. Semantic coherence and exclusivity

