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Abstract

Digital participatory platforms like Wikipedia are often celebrated as projects that allow anyone to contribute. Any user can sign up and start contributing immediately. Similarly, projects that engage volunteers in the production of scientific knowledge create easy points of entry to make contributions. These low barriers to entry are a hallmark feature in digital participatory labor, limiting the number of hoops a new volunteer has to jump through before they can feel like they are making a difference. Such low barriers to participation at the periphery, or edges of participatory platforms, have presented a problem for organizational scholars as they wonder how such projects can achieve consistent results when opportunities to train and socialize newcomers are constrained by a need for low barriers. As a result, scholarship has focused on answering the question of newcomer learning and socialization by examining how newcomers make sense of their new digital workspaces rather than focus on how institutional constraints are imposed. In this research, I draw on a growing body of scholarship that pushes against the perception of openness and low barriers on digital participatory platforms to unpack the constraints on participation that newcomers confront and, in particular, to show how such constraints resemble characteristics of institutionalized newcomer onboarding tactics.

To approach this question, I conducted 18 months of participant observation and conducted 36 interviews with experts, newcomers, and project leaders from the crowdsourced citizen science platform Planet Hunters and the peer produced encyclopedia, Wikipedia. I analyzed my data using a grounded theory research design that is sensitized using the theoretical technology of Estrid Sørensen's Forms of Presence as a way to pay attention to the sociomaterial configurations of newcomer practice, attending to the actors (both human and nonhuman) that play a part in the constraints and affordances of newcomer participation. By drawing on Sørensen's Forms of Presence, the analytical focus on the newcomer experience shifts from looking at either top-down institutional tactics of organizations or bottom-up individual tactics of newcomers to thinking about the characteristics of relationships newcomers have with other members and platform features and the effects of these relationships as they relate to different opportunities for learning and participation. Focusing on the different ways that learning and participation are made available affords the exploration of how the authority of existing practices in particular settings are imposed on learners despite the presence of low barriers to participation.

By paying attention to the sociomaterial configuration of newcomer participation, my findings unpack the tactics that newcomers encounter at the periphery, or edges of participatory platforms, as well as how they find their work being included or excluded from the platform. I use the findings to develop a taxonomy of encounters that describes how newcomers can participate in a self-guided experience as the existing literature describes, but also experience moments of guided and targeted encounters. What this taxonomy of encounters suggests is that the periphery of participatory platforms can be at once an open space for exploration and experimentation but also a well-managed space where, despite low barriers to initial participation, a newcomer must negotiate what I describe as the guardrails of participation that define the constraints and affordances that shape their experience.

Encounters with Authority: Tactics and negotiations at the periphery of participatory platforms

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Chapter 1: Barriers or Guard Rails?

1.1 Newcomers Are Not Alone: Two Vignettes

The advent of open online participatory platforms like Wikipedia and citizen science projects like Galaxy Zoo have helped reimagine how large-scale projects can redesign work processes in order to incorporate the input of tens of thousands of volunteers, accelerating the pace at which encyclopedic content can be updated and scientific data can be processed. These digital platforms and their respective tasks are designed to allow volunteers with a few minutes or a few hours on their hands, to stop by and contribute toward the goals of the project. Yet a project's waiting for anyone to stop by and help out poses some challenges to the continuity and quality of the work that gets done. Projects with such digital platforms, platforms often described as maintaining low barriers to participation (Raymond, 1999), cannot ask volunteers to go through extensive training before they make initial contributions, as they may then be turned off by the project and not contribute anything substantial or meaningful. At the same time, such platforms must ensure that the new volunteers are contributing work that aligns with the goals of the project. How, then, do platforms that depend on volunteers but need to keep their barriers low encourage work that is consistent with their goals? The question is often answered by positioning newcomers as the lonely explorers of a new world, starting out as observers at the edge of a foreign environment, making a few contributions, getting some feedback on their work from other volunteers, and reading documents that define how work should be done (Antin & Cheshire, 2010; Bryant, Forte, & Bruckman, 2005; Preece & Schneiderman, 2009). While this perspective captures one aspect of how newcomers learn in

platforms with low barriers to participation, it misses out on the range of platform features and procedures deployed at the periphery of the platform where newcomers participate, implicitly or explicitly shaping and defining how newcomers learn and contribute to the project. To illustrate the forces and features that shape the newcomer experience, I provide two vignettes from two digital participatory platforms that highlight how, despite the appearance of low barriers to participation, the authorities that define how work should be done always stay close by, playing an active part in the early experience of the newcomer.

1.1.1 Wikipedia

Inspired by what he is learning in his college courses, Jesse goes to Wikipedia to write an article about a topic that does not yet exist in the online encyclopedia. Upon creating a new account, he receives a long message on his talk page, a space on Wikipedia where users can leave each other messages. The message welcomes him to Wikipedia, outlines key points about social norms regarding interactions with other members, and provides descriptions of the policies and guidelines related to editing articles. The message, placed on his page by another user, was generated using a single line of code pasted to Jesse's talk page that links to a specific message in a library of template messages managed by experienced users on Wikipedia. Jesse, like many other newcomers, finds the template message to be a useful resource as he skims a few items to learn more about his new environment. Despite the extensive number of guidelines and policies regarding editing and socializing with other editors, Jesse jumps right into developing his new article on his first day as a new volunteer. A few days later, his talk page receives a new message generated from a template. This time, the message has to do with the article he is working on. The message states that his article has been marked for "Speedy Deletion,"

meaning that someone has detected its presence and, based on a series of criteria regarding topical notability (i.e., whether or not an article merits an entry in an online encyclopedia), the article will likely be removed. Six hours later, Jesse receives yet another template message indicating that a bot on Wikipedia has scanned his article and that the content of his article resembles the content of a blog, suggesting that Jesse's work may be in violation of Wikipedia's content copyright policy. A few days later, yet another template message is posted on Jesse's talk page, this one indicating that his recent edit on a different article was reverted because he failed to provide a justification for the substantial changes he had made. In a little over a week since registering, Jesse has received a collection of template messages on his talk page that amount to a library of guidelines and policies relating to key concerns about article quality standards that must be adhered to. For Jesse, each of these template messages helped him learn about contributing to Wikipedia. With each message, he adjusted his work to address the concerns outlined in the message, eventually leading to his article being accepted by other editors on Wikipedia.

1.1.2 Planet Hunters

Caroline is a kindergarten teacher who has always been fascinated by astronomy. When she first heard about Planet Hunters on her favorite science television show, she seized the opportunity to engage in a new outlet to pursue her love of the stars. In Planet Hunters, volunteers are asked to review data from the Kepler space telescope that represent the brightness of stars, or light curves. In this data, volunteers look for abnormal dips in the measure in the light curves, where such dips potentially indicate the presence of a planet that passed between the telescope and the star. As soon as the website loads in her browser, she is

immediately presented with a tutorial that simulates the experience classifying stars, directing her attention to characteristics of a fake light curve that would represent a transiting planet and instructing her on how to use the tools of the classification interface to mark that data. After completing the tutorial, she is presented with her first light curve. Still uncertain about how to identify the presence of abnormal dips in the light curve, she clicks on the “help button” in the classification interface for a reminder about what characteristics to look for. Satisfied with the information she finds after clicking on the help button, she provides an answer to the best of her ability. However, in the next light curve she reviews, she is still confused about how to do the task. Reviewing the help button again, she is unsatisfied with the depth of the information, so she steps away from the classification interface altogether and clicks on a link to the site guide. There she finds FAQs and descriptions about the science of identifying transiting planets in light curve readings. After browsing the site guide, Caroline returns to the classification interface, where she uses a tool that lets her zoom into the light curve based on preset levels determined by the scientists. Armed with the information from the site guide and her own analysis of the data using the zoom tool, Caroline annotates the light curve in a few places to indicate what she believes is evidence of a transiting planet. With the completion of the classification, the interface asks Caroline whether or not she would like to “discuss this star.” Caroline selects “yes” and is brought to the talk page where the light curve she classified is presented along with an option to leave a comment that is less than 140 characters. Caroline observes that other volunteers have left comments, some pointing out what they believe to be the presence of transiting planets at particular points in the light curve. As a newcomer, Caroline finds such comments to be valuable learning opportunities because they demonstrate

what other volunteers pay attention to when classifying light curves. While Caroline would like to leave a comment, she finds that the existing comments exhibit a degree of expertise that she is not proficient with. Unsure of how to write the comment in the talk space, Caroline returns to the classification interface to annotate another light curve.

1.1.3 Newcomers and Participatory Constraints

The two vignettes reflect common accounts of what it is like to be a newcomer to Wikipedia and Planet Hunters, and yet, and what I propose in this dissertation, such accounts contrast with existing conceptualizations and descriptions of what it means to participate as newcomers on participatory platforms. In particular, I point out that ascribing the condition of low barriers (Raymond, 1999) to participation on these platforms supports the notion that they are unable to accommodate institutionalized socialization tactics (Farzan, Kraut, Pal, & Konstan, 2012; Kraut, Burke, Riedl, & Resnick, 2011), which, while technically correct, obfuscates how institutional constraints exist at the periphery of these platforms, constraining and enabling the opportunities to learn and participate, effectively defining the agency of the newcomer on the platform.

To situate the need for such a reconceptualization, this chapter begins by first revisiting the excitement of participatory culture in the early 2000s, pointing to the origins of the conceptualization of conditions for participation for newcomers on the periphery of platforms as low, flexible, and defined by the individual will of the participant. I will then speak to the critical turn in research on participatory platforms, emphasizing the emergence of more nuanced investigations into what openness and participation in the digital realm means.

Reflecting on this critical turn, I will unpack its implications for how we describe the conditions

of participation for newcomers, which also motivates a need to redefine the concepts of peripheral participation. In working to redefine the conditions of peripheral participation, I suggest that while barriers to initial participation may be low, the newcomer experience and the conditions of participation can be more accurately defined as a series of encounters with “guardrails” created by the experts and leaders of the platforms that define opportunities for newcomer learning and participation.

1.2 Not All Participation Is the Same

In 2006, *Time* magazine declared that the person of the year was You (Grossman, 2006).

Inspired by platforms like YouTube and Wikipedia, Grossman points to the internet and the advent of web 2.0 technology as technologies that help everyday people define how knowledge is represented and what entertainment is consumed. In pointing to the power of everyday users of the web, Grossman was contributing to the growing excitement about the success of participatory platforms that supported free and open source software production, citizen journalism, and citizen science. All of these examples were framed as contributing to a shift in power away from the traditional gatekeepers that controlled what information and cultural content the public could consume. The institutions that once held a monopoly on the production, curation, and editing of cultural content and scientific knowledge now had to contend with everyone else who had access to the internet (Weinberger, 2011).

At the heart of this shift in power is what Yochai Benkler describes as the networked information economy. Drawing on Habermas’s idea of the public sphere, or the means by which collective societal concerns converge and are expressed (Habermas, 1991), Benkler describes how the networked information economy provides new opportunities and possibilities for

these collective concerns to be expressed and communicated amongst members of society (Benkler, 2006). In a networked public sphere, the cost of communicating one's ideas out to a wide audience is considerably less than in a mass media model, where single hubs of access to large audiences are guarded by the high costs of operating a newspaper or television station. With the advent of the internet, tools like blogs, emails, and discussion forums significantly reduced the cost required for someone to not only publish their ideas and concerns, but reach a wide audience. As Benkler points out, in the networked public sphere we are less likely to be passive readers of content; instead we can respond to what we read, and react to what we experience, find other people who are also concerned and take action to address these concerns (Benkler, 2006). The role that the architecture in the networked information economy plays in this shift from consumer to creator has been documented as an integral part in social movements (Costanza-Chock, 2014), actions against large institutions such as the case of the Catholic Church's priest abuse scandal (Shirky, 2008), the creation of cultural content by fan fiction communities and amateur remixes of music and movies (Jenkins, 2006; Lessig, 2008), grassroots journalism (Gillmor, 2008), and the production of free and open source software (Benkler, 2006).

In bypassing the traditional publication infrastructure, people also bypass the credentials needed to participate in the production of knowledge and culture. People are no longer required to possess degrees or certifications from educational institutions in order to participate in aspects of scientific research, the development of software, or the writing of encyclopedic articles. The idea of low barriers to participation was a reflection of changes in the social barriers to participation as much as the shifts in technical barriers that people once faced.

Keeping with this idea that low barriers to participation points to curbing the requirements needed to participate, extensive research exploring the motivation of volunteers and growth of open source projects has found that low barriers to participation in such projects are integral to their success because newcomers do not want to wade through extensive tutorials or training before they can start having an impact on the project (Anthony, Smith, & Williamson, 2007; Benkler, 2002; 2006; Crowston, Jullien, & Ortega, 2013; Forte & Lampe, 2013; Raymond, 1999; Schweik & English, 2007). The imagery of low barriers to initial participation has framed core assumptions in research on the experience of newcomers to open online communities, suggesting a free form experience where the newcomer makes sense of a project on their own terms (Preece & Schneiderman, 2009). Newcomer learning is characterized by a process of starting at the edge of a new participatory platform—the periphery—observing what others do, and seeking feedback from others as the newcomer gradually moves away from the periphery toward a more central role as an embedded and valued contributor (Bryant et al., 2005; Ducheneaut, 2005). The emphasis on low barriers to participation has also promoted the idea that, compared to institutionalized models of newcomer onboarding in firms where newcomers go through formal training experiences, participatory platforms cannot institute traditional approaches to newcomer onboarding (Farzan et al., 2012; Kraut et al., 2011). As a result, researchers look to strains of organizational socialization research that speak to how individuals make sense of new settings on their own as a way to contend with environments that often do not impose institutionalized socialization tactics (e.g., Ahuja & Galvin, 2003; Burke, Marlow, & Lento, 2009; Qureshi & Fang, 2010)).

Despite the excitement about the low barriers of participatory platforms, the past several years have seen a growth in research that pits the rhetoric of openness against its reality, reassessing what openness and participation means in the context of participatory platforms. As Darin Barney and his colleagues point out, “While numerous participatory media projects rely on a colloquial understanding of openness—simply allowing anyone to participate—in practice, openness is operationalized distinctively as an endeavor” (Barney et al., 2016: 26). In the context of social media platforms like Facebook and YouTube, new media scholars like Tarleton Gillespie have examined this endeavor in the way the platforms intervene in the experience of the user (Gillespie, 2015). Scrutinizing the rhetoric of open participation, Gillespie notes that all platforms have edges that encourage participation but also define the conditions under which this takes place. Such conditions are “practical, technical, economic and legal, and they stray far from the hands-off neutrality suggested by the ‘platform’ rhetoric” (Gillespie, 2010, p. 358). Also focusing on the network of technical, legal, and economic conditions that define participatory platforms, Langlois (2013) suggests that the governance of social media platforms channels the agency of participants based on such conditions and therefore has implications for how we define communication in society.

The rhetoric of openness has also been scrutinized by drawing sharp distinctions between peer production and crowdsourced models of production. Where peer production projects reflect a form of participatory production in which volunteers contribute both to the production of the product and the social and technical means of production (e.g., Wikipedia, Debian Linux), the crowdsourcing model is defined by a top-down approach to task coordination where the tasks are predetermined by a small group of experts and the volunteers

are engaged in work that does not require any collaboration (Brabham, 2013; Forte & Lampe, 2013). Examples of crowdsourcing range from websites where people can post and vote on t-shirt designs to be printed (Howe, 2006), to scientists putting up data for volunteers to annotate (Wiggins & Crowston, 2011).

Despite their distinction from crowdsourcing platforms, peer production platforms like Wikipedia and free and open source software projects like Linux have gone down the inevitable path of evolving from bottom-up nonhierarchical models of organization to more routinized, hierarchical, and bureaucratized models of coordination (Butler, Joyce, & Pike, 2008; Kelty, 2016; Shaw & Hill, 2014). Peer production models are often synonymous with ideas of self-determination, where participants not only define what they want to do, but how they want to do it. Scholars have pointed to examples of peer production projects exhibiting the qualities of recursive publics, where the volunteers also involve themselves in the creation and maintenance of the very platform infrastructure that affords their participation (Kelty, 2008). In examples of peer production, the ideas of low barriers to participation and the broader excitement of participatory culture have painted platforms like Wikipedia or Debian as examples of direct democracy, where, despite the presence of a charismatic leader, there are no formal leaders dictating what work should be done and all decisions are made on consensus (Benkler, 2006; Coleman, 2013). While peer production platforms like Wikipedia proclaim that anyone can participate, a growing body of scholarship is recognizing that there is a well-defined body of policies and guidelines that volunteers should be aware of if they want their work to stick, and that emergent roles and the privileges that accompany them point to hierarchical characteristics of organization (Butler et al., 2008).

The emergence of functional roles and hierarchies, for example, have been shown to create a hierarchy in Wikipedia, where different roles have unique editing privileges intended to help users uphold and perpetuate policies and norms of participation (Arazy, Nov, & Ortega, 2014; Arazy, Ortega, Nov, Yeo, & Balila, 2015; Butler et al., 2008). Pushing the argument about emergent hierarchies to an even further extreme, a study of 683 projects on Wikia.com revealed that, with few exceptions, they trended toward oligarchic models of power concentration, where “the self-selecting and early-adopting few assert their authority to lead in the context of movements without clearly defined institutions or boundaries” (Shaw & Hill, 2014, p. 233). Extending the work on emerging hierarchies in the governance of peer production projects, scholars have also examined the emergence of algorithmic governance on Wikipedia, whereby the task of upholding particular guidelines and policies are delegated to bots that detect activity deviating from established projects standards, make the necessary corrections, and in some cases, warn the offending users (de Laat, 2015; R. S. Geiger, Halfaker, Pinchuk, & Walling, 2012; Halfaker, Geiger, & Terveen, 2014; Halfaker, Geiger, Morgan, & Riedl, 2013a; Müller-Birn, Dobusch, & Herbsleb, 2013).

The shifts in governance models described above have amounted to an increase in what can be described as forms of gatekeeping. The ongoing work to uphold the standards of participation of Wikipedia has made it harder to participate (Halfaker, Geiger, Morgan, & Riedl, 2013a; Jemielniak, 2014), with some describing the ongoing efforts of boundary work where participants dedicate a great deal of effort to determining what content is allowed to stay and what must be rejected (Ford, 2015). Others have described “regimes of socialization” (Geiger et al., 2012) or “sociotechnical gatekeeping” (Halfaker, Geiger, Morgan, & Riedl, 2013a), where

algorithms relentlessly patrol the activities of new users to make sure that their work aligns with established standards of participation. The increasingly oppressive nature of defending the standards of Wikipedia has led some to revise Wikipedia's famous motto of "the encyclopedia that anyone can edit" to "the encyclopedia that anyone who understands the norms, socializes himself or herself, dodges the impersonal wall of semi-automated rejection, and still wants to voluntarily contribute his or her time and energy can edit" (Halfaker et al., 2013, p. 20).

Recognizing these challenging pathways to participation, researchers have both explored and designed support features that help newcomers learn the standards and have more success with their contributions on Wikipedia (Halfaker et al., 2014; Morgan, Bouterse, Walls, & Stierch, 2013; Mugar & Schilling, 2015; Narayan, Orlowitz, Morgan, & Shaw, 2015).

While the experience of a newcomer is always driven by their own volition and learning is still defined in part by their willingness to observe existing activity and experiment with making contributions, descriptions of "sociotechnical gatekeeping" and the growth of newcomer support features suggest that the periphery of participatory platforms, like the broader governance structures, have evolved beyond an open space for exploration and experimentation to a highly contested and negotiated space where new forms of governance structure and practice are deployed. As the two vignettes at the start of this chapter suggest, newcomers can jump into making contributions immediately, however their participation is situated and in some cases constrained by the needs and goals of the respective projects. In the same way that the idea of openness on participatory platforms has been tempered by a recognition of the moderation features of YouTube and the governance structures of Wikipedia, the concept of low barriers to participation at the periphery of participatory

platforms must also reflect the conditions of participation that reflect how the endeavor of openness is performed.

1.3 Examining the Conditions of Peripheral Participation

The purpose of this dissertation is to revisit how we define the periphery of platforms and the perceived low barriers to participation. To do this, I work to reconcile the growing recognition of the conditions of participation on participatory platforms with the perspective of low barriers to participation in research on newcomers to peer production and citizen science projects. To unpack the conditions of participation at the periphery of participatory platforms, this dissertation takes as its site of investigation the construction of a newcomer's agency on the platform. Using a newcomer's agency as the point of departure directs the analysis toward the constraints that are imposed on the newcomer and how they negotiate such constraints. Focusing on the constraints that a newcomer confronts helps to reveal and trace the relationships that newcomers have with platform features, other users, and policies that play a role in shaping how a newcomer learns about and contributes to the ongoing practice on the platform.

In Chapter 2, I begin my investigation of the conditions of peripheral participation by reviewing existing scholarship and the underlying theories and concepts that drive research on newcomers to participatory platforms. Looking to research on organizational socialization and learning that has influenced this investigation, I examine how the phenomenon of newcomers to work and social settings has been studied, emphasizing how the distinction between individual and group learning has been conceptualized as well as reviewing the foundations of the concept of peripheral participation while pointing to its advantages and drawbacks when

applied to contexts of online participatory platforms. My review of the research on newcomers to participatory platforms, emphasizes three key themes in the literature, all of which prioritize the experience of the individual in making sense of new settings while mostly playing down the role of institutional constraints and the presence of nonhuman actors, focusing instead intersubjective means of learning.

To move past a uniquely humanistic perspective of the newcomer experience, I propose the use of a grounded theory research design that is sensitized using the theoretical technology of Estrid Sørensen's forms of presence (Sørensen, 2009, 2013) as a way to pay attention to the sociomaterial configurations of newcomer practice, attending to the actors (both human and nonhuman) that play a part in the constraints and affordances of newcomer participation. By drawing on Sørensen's work, the analytical focus on the newcomer experience shifts from looking at either top-down institutional tactics of organizations or bottom-up individual tactics of newcomers to thinking about the characteristics of relationships newcomers have with other members and platform features and the effects of these relationships as they relate to different opportunities for learning and participation. Focusing on the different ways learning and participation are made available allows for the exploration of how the authority of existing practices in particular settings are imposed on learners, and, therefore, how the practices that define platforms are perpetuated across time and space.

In the third chapter I describe the research design and methodology used to illustrate a sociomaterial perspective of the newcomer experience. Here I describe the two cases that serve as the sites of research. The first case is Wikipedia, a mature peer production project where an evolving governance structure has worked to redefine what was once described as an

individual sense-making journey for newcomers (Bryant et al., 2005) into a peripheral experience that features tutorials, template messages, and semi-automated editing tools that shape participation. The second case is Planet Hunters, a crowdsourced citizen science platform that features a well-defined periphery of participation, giving little opportunity for a newcomer to wonder what their role in the project is and how to execute the task at hand. Both cases are presented as extreme case comparisons in that they are technically defined as being bottom-up versus top-down models of volunteer engagement, with the former offering more roles for volunteer-led governance and the latter not offering any such opportunities. Data collection is deployed as an ethnographic study. It including 18 months of participant observation and 36 interviews with experts, newcomers, and project leaders across both cases, with the data analyzed using a grounded theory approach sensitized by Sørensen's forms of presence so as to emphasize attention to the relationships with actors (both human and nonhuman) that play a part in defining the opportunities for newcomer participation and learning.

The fourth and fifth chapters describe the themes from my findings that describe the tactics deployed to manage the periphery of participation and how newcomers negotiate these tactics. In the fourth chapter I describe points of entry, a concept that reveals explicit tactics that project leaders and experts deploy in order to lay claim to the periphery of participation, shaping the way in which newcomers learn and contribute. For example, formal points of entry describe explicit tactics across both cases that are designed to capture and direct the attention of newcomers toward spaces in the project that are saturated with the authority of project experts and leaders. In some cases, this is observed as tutorials that give newcomers the opportunity to practice contributing without impacting the ongoing activities of the project, or

to ask questions of experts who are tasked with responding based on particular protocols of interaction. In these examples, newcomers are brought into spaces of participation where they are not only fed standardized information, but are fed by those imposing their authority do so within a tightly constrained environment as well. The theme of ad-hoc points of entry describes a simultaneously premeditated and reactive strategy used by experts to control participation at the periphery of projects. In ad-hoc points of entry, project experts develop a series of algorithms and libraries of template messages that lay waiting to detect and engage newcomers around specific actions. Over the course of their initial experience contributing to a project, a newcomer will receive a combination of different template messages addressing particular issues with their work. While the sequence of messages that a newcomer receives is unique to their experience, the actions that they engage in and the messages that are delivered to them are part of an established strategy for contending with newcomers.

Also in the fifth chapter, I describe the concept of inclusion and exclusion, which demonstrates how newcomers negotiate constraints and affordances of participation and how these negotiations factor into their work being accepted or rejected from the platform. The process of a newcomer's work being accepted and included in a project can be understood as whether or not one's contributions are valued by more established members. Thought of in this way, inclusion can be broadly understood as a political phenomenon, defined by the way a newcomer is related to established experts of a community that actively decide whose work is valuable or not. However, where work by Ducheneaut (2005) and others focus on the intersubjective characteristics of this political dynamic, I describe examples of how this relationship and determination of value by experts is performed not only by human actors, but

with nonhuman actors as well. For example, I observe how a newcomer's work is framed and informed so that their opportunities for participation are limited to a select number of choices that mostly align with approved modes of contribution. In the theme of exclusion, I describe how newcomer work will be rejected if it does not incorporate the use of legitimate and required objects and subsequently, how newcomers who are rejected will retreat to operate outside of, or in the margins of, the platform where they renegotiate their approach to participating, either attempting to align their work with the standards of practice or to challenge them.

Based on the findings, I propose in the sixth chapter a framework for describing how the periphery of participation can be experienced both from an individually motivated and directed experience and from a tightly constrained one as well. I describe this framework as a taxonomy of encounters where we observe newcomers operating in a self-guided experience as the existing literature describes, but also in moments of guided and targeted encounters. Guided encounters describe explicit tactics to frame how a newcomer learns and how they participate. These exist as well-defined spaces on the platform that newcomers participate in to learn and contribute. Targeted encounters, on the other hand, describe tactics that are both reactive and premeditated, where algorithmically assisted tools detect the activity of newcomers and institutionally defined responses to newcomer activity are deployed.

What this taxonomy of encounters suggests is that the periphery can be at once an open space for exploration and experimentation and also a well-managed space where the newcomer must negotiate a series of constraints and affordances that actively play a part in their participation. By showing how the periphery can be both an open and constrained space,

the newcomer experience is depicted not uniquely as an active newcomer making sense of a passive organization during their encounter. Instead, by examining the periphery as a managed space, the newcomer experience is described as a series of encounters between the newcomer and the authority of experts and leaders of the platform that constrain how a newcomer not only learns to participate, but how they contribute to the project as well.

1.3.1 Significance

By examining how the periphery of participation can be a managed space, this research offers scholars and practitioners alike an opportunity to reimagine how they approach their work. For researchers and practitioners, this work addresses the challenge of holding the two seemingly dissonant concepts of institutionalized newcomer onboarding and ad-hoc participation together and seeing how they can coexist. As the second chapter will explore in more detail, institutionalized socialization tactics, or the process of onboarding newcomers in a group and providing standardized learning material (Jones, 1986; Van Maanen & Schein, 1979), has been shown to help new members respond to a range of situations in a homogeneous and consistent manner (Jones, 1986), yet with a need for low barriers to participation and an ad-hoc and highly diverse group of participants, how do participatory platforms achieve the conditions and outcomes that institutionalized socialization tactics achieve? By examining the production of newcomer agency and the opportunities for learning and participation, this research helps to advance a conversation about how similar constraints of institutionalized socialization tactics are achieved in contexts that are distinct from traditional corporate settings. In showing how these two seemingly disparate concepts can be brought together in practice, this work shows how the idea of the individualized newcomer experience misrepresents and avoids many of the

features and forces that play an active role in their experience at the periphery of participatory platforms. In particular, this work will bring into relief the role of nonhuman actors in the newcomer experience, building on a growing conversation about their role in the learning experience of newcomers (Halfaker, Geiger, Morgan, & Riedl, 2013a; Mugar, Østerlund, Jackson, & Crowston, 2015) and the broader governance of participatory platforms (Geiger, 2011; Geiger & Halfaker, 2013b; Geiger & Ribes, 2010; Müller-Birn et al., 2013; Niederer & van Dijck, 2010). Lastly, this work will also contribute to the broader conversation about the conditions of participation on participatory platforms, identifying the work and constraints that go into defining conditions of openness (Barney, Coleman, Ross, Sterne, & Tembeck, 2016; Kelty & Erickson, n.d.; Tkacz, 2014)

For practitioners, this research demonstrates approaches to managing the periphery that work toward goals of organizational socialization tactics while also recognizing the challenges of an ad-hoc and heterogeneous pool of participants. Where previous work, geared toward practitioners, situates the work of managing newcomers within the assumption that users must be treated as individual information seekers making sense on their own terms (Kraut et al., 2011), this work emphasizes what can be described as institutionalized tactics for newcomer onboarding, providing a standardized set of content at specific points throughout a newcomer's experience. Furthermore, this work also advances a practical understanding of how newcomers negotiate conditions of participation at the periphery, and in some cases challenge, resist, and subvert the conditions of participation. Such acts of resistance are, in some cases, important parts of how newcomers find their place and purpose in a project and can also help to challenge systemic biases on a platform, allowing the platform to grow and

become more inclusive. In highlighting examples where newcomers resist normative practice, this work advances an understanding for practitioners of how to preserve and design for conditions of participation that accommodate and encourage moments of resistance.

1.4 Conclusion

In this chapter I describe a growing recognition amongst scholars that the concept of participation on participatory platforms is not a general concept, but a complex endeavor that varies from one context to the next. How platforms frame opportunities for participation has gained recognition within descriptions of governance practice, highlighting the extensive and complex institutional models that define practice for volunteers on projects ranging from free and open source software projects to crowdsourced citizen science projects. However, the attention to the impact that such institutionalized practice has on governance has not changed broader perceptions of how we describe the conditions of participation for newcomers on participatory platforms. In this chapter, I propose an outline of a study that moves our understanding of participatory conditions at the periphery from one that positions the newcomer as an individual information seeker making sense of a passive platform, to a broader taxonomy that points to the different ways a newcomer negotiates a complex institutional framework of practice that shapes their opportunities for learning and participation. Described as a taxonomy of encounters, I highlight different moments in which newcomers encounter the constraints on their participation imposed by the authority of platform experts and leaders while also emphasizing how newcomer negotiate such constraints.

Chapter 2: Complicating the Assumption of Low Barriers to Participation for Newcomers

2.1 Introduction

The phenomenon of people donating their time and energy to open online participatory projects is supported by low barriers or costs to initial participation (Benkler, 2002; Raymond, 1999). Yet, despite these low barriers to entry, such projects have quality standards that new participants need to understand in order for their contribution to be consistent with existing work on the platform. How then do platforms navigate this tension between maintaining low barriers to participation while also informing newcomers of the standards that define the practice of the platform? This tension between maintaining low barriers to participation and standards of practice has, with few exceptions, been overlooked, with researchers focusing primarily on the experience of how newcomers navigate their new environments.

The focus on the self-directed nature of the newcomer experience and the importance of low barriers to participation has led to widely held assumptions that, because platforms cannot impose any extensive onboarding processes on new volunteers, the newcomer experience is necessarily an individualized one, where newcomers jump into action and figure out how to participate on their own (Choi, Alexander, Kraut, & Levine, 2010; Kraut et al., 2011; Preece & Schneiderman, 2009). While the overarching experience of newcomers can be described as informal and individualized, in contrast to the institutionalized new employee onboarding processes found in corporate settings, there is a growing awareness that

participatory platforms actively define the conditions of participation at the periphery. For example, a newcomer to Wikipedia is often inundated with template messages about how their work does not fit standards of practice, or their work may be rejected altogether, while newcomers to crowdsourced citizen science platforms often use tools to do their tasks that have been calibrated by the scientists running the project in such a way that constrains the actions of the participant. The growing recognition that the leaders and experts of participatory platforms shape the conditions that define how newcomers learn and contribute suggests a need for a hybrid perspective of the newcomer experience. This hybrid perspective can help account for the increasingly evident newcomer onboarding tactics defined by experts and leaders of online participatory projects while also considering how such constraints exist alongside the self-directed experience of newcomers.

To investigate how participatory platforms maintain low barriers to participation while also steering newcomers toward an understanding of standards that define the ongoing practice on the platform requires analytical flexibility that does not exist in current conceptualizations driving existing research. Responding to this need for a flexible analytical approach to newcomer research, I propose the use of Estrid Sørensen's sociomaterial perspective on learning, which examines how varying configurations of human and nonhuman actors have different effects on a learner's agency in an educational setting. For example, Sørensen describes how the sociomaterial configuration of students sitting in chairs facing the teacher standing next to a chalkboard produces the effect that the teacher has authority over the students, whereas the configuration of students sitting in a circle with the teacher singing a song together creates a collective experience, with no one person standing out as the leader. In

this example, it is the attention to the sociomaterial configurations of chairs-students-chalkboard-teacher or students sitting in a circle, that reveal how the agency of the student is constructed in a particular setting. As I will argue, this sociomateriality provides the analytical flexibility required to make sense of a newcomer experience where they are at once free to explore but are also faced with varying constraints and affordances of the platform that inform how they learn and participate. By using a sociomaterial approach to examine the configurations of newcomer participation at the periphery of these platforms and identifying the effects on the agency of newcomers, I argue that we are afforded the flexibility to reimagine how we describe the way in which participatory platforms perpetuate standards of practice despite low barriers to participation.

In this chapter I begin by reviewing the literature on learning and organizational socialization that has acted as a source for key assumptions driving existing research on the newcomer experience to participatory platforms. With this foundation in place, I review research on the experience of newcomers to participatory platforms, highlighting key themes and moments that motivate a need to consider a hybrid perspective for the newcomer experience. I conclude the chapter with a review of Sørensen's empirical work, highlighting how her methodological approach, inspired by sociomaterial theories, can help reframe existing research as well as articulate research questions for new investigations.

2.2 Foundations for Research on Newcomers to Participatory Platforms

At the heart of research on newcomers to participatory platforms are concepts and theories stemming from scholarship on organizational socialization and learning. The objective of this research is to examine how people enter into a new social or work setting and move from a

state of being uncertain about the norms and processes of interacting with coworkers and doing work to becoming proficient. For example, the deep ethnographic work of John Van Maanen explored the experience of cadets in a police academy and how they moved from a state of viewing their new setting as a foreign land to becoming well versed in the cultural expressions and practice of being a police officer (Van Maanen, 1973). For Van Maanen and others, research on organizational socialization and learning is focused on how people develop an understanding of and become fluent in the principles that shape how people in a specific organization interpret and interact with each other and new situations. From an organizational perspective, this question is important as it considers how continuity of organizational culture and work can be achieved in the face of new members who are not familiar with the culture in question.

By reviewing key concepts from the organizational socialization and learning literature, I highlight the foundations that not only ground research on newcomers to online participatory platforms, but also point to the sources of ideas that have led existing research to overlook the ways in which participatory platforms navigate the tension between low barriers to participation and define the conditions for newcomer activity. I begin by reviewing concepts that have encouraged researchers to view the newcomer experience as either individualized or institutionalized; I then review concepts around how newcomers utilize individual strategies to navigate new environments, and I conclude with a review of a learning theory that has shaped how researchers conceptualize low barriers to participation and the conditions of participation and learning at the periphery of participatory platforms.

2.2.1 Individualized Versus Institutionalized Socialization Tactics

How organizations approach the onboarding of new members has been described by the tactics used to deliver information that define what being a member of an organization means (Jones, 1986; Van Maanen & Schein, 1979). Researchers have examined how varying tactics for influencing newcomer learning have different outcomes regarding newcomers' certainty or uncertainty about their position and purpose in an organization (Ashforth, Sluss, & Harrison, 2007).

Integral to how researchers have framed the learning experience of newcomers to participatory platforms is Gareth Jones's framework describing institutionalized versus individualized socialization tactics (Jones, 1986). The grouping of institutionalized and individualized tactics describes the content and the context of the information delivered to newcomers and their relationship to the subsequent predictability of how newcomers will react to new situations (see Table 2.1).

In terms of the context in which information is delivered, institutionalized tactics reflect formal and collective tactics, where newcomers are segregated from existing members (formal) before they can participate with existing members and all receive the same information (collective). Similar to what we might observe in a traditional classroom with students reading from the same textbook and doing the same assignments as instructed by the teacher, formal and collective tactics are intended to ensure that a group of newcomers will all adopt a homogeneous approach to responding and reacting to new situations, ensuring that their behavior is predictable and in line with existing standards of practice. The individualized grouping of tactics that reflect context of learning are, on the other hand, described as informal

and individual, where newcomers are not segregated from the existing population of members (informal) and no one newcomer receives the same information as another newcomer. In this context, the behavior of newcomers to new situations is less predictable because of the heterogeneity of how and what information is delivered.

The tactics for content in Jones's framework reflect the pedagogical strategy for learning, focusing on whether or not a newcomer is clear about the sequence of what they will learn. On the institutionalized end of the spectrum, Jones describes fixed and sequential tactics, where a newcomer is both aware of what they will learn and when they will learn it. Like a well-defined curriculum and syllabus, fixed and sequential tactics around the content of what is to be learned helps newcomers understand their progress in the experience of learning how to be a productive member in their new setting. On the opposite end of the spectrum are variable and random tactics around content, where a newcomer is not aware of what they will learn or when. Like informal and individualized tactics, variable and random tactics also lead to heterogeneous and unpredictable responses by newcomers to new situations.

The dichotomy of how newcomer learning experiences are executed has been integral to describing what the newcomer experience looks like in a setting that must maintain low barriers to participation. Because participatory platforms run the risk of losing new members if they require too much of volunteers before they can start participating, the newcomer experience has been described as falling largely on the individualized end of Jones's framework, with no prescribed curriculum for learning how to participate and with immediate participation without first having to go through training. However, as the latter sections of this chapter will describe, the clean dichotomy of individualized versus institutionalized tactics does not

accurately represent some of the emergent examples of how participatory platforms navigate the tension of maintaining low barriers to participation while also framing the newcomer experience to create more predictable behavior.

	Institutionalized	Individualized
Context	Collective Formal	Individual Informal
Content	Sequential Fixed	Random Variable

Table 2.1 Summary of Socialization Tactics (Adapted from Jones 1986)

2.2.2 Proactive Tactics

With the driving assumption that the newcomer experience is primarily an individualized experience, researchers have looked to the concept of proactive tactics in the organizational socialization research to describe the different approaches that newcomers take to elicit information about and make sense of their new environment. Miller and Jablin (1991) describe newcomers using such tactics as direct and indirect questioning, testing limits to elicit a response, observing and unobtrusively gathering information, and disguising information seeking as conversations.

Testing various proactive tactics in relationship to newcomer productivity, Morrison (1993) finds that proactive tactics predict increased task mastery, acculturation, social integration, role clarity, and job performance. Paying attention to the relationship between information sources and behavioral outcomes, work by Ostroff and Kozlowski (1992) comes to similar conclusions regarding proactive tactics and socialization outcomes, finding that

newcomers relied on a variety of information sources for information gathering and that different sources had varying importance for such outcomes as job satisfaction, organizational commitment, decreased stress, and intentions to quit.

Many online communities do not exhibit institutionalized socialization strategies as they are defined in Jones's framework. Researchers have used work by Morrison (1993, 2002), Ostroff and Kozlowski (1992) and Miller and Jablin (1991) to explore the information-seeking strategies of newcomers in such online settings as organizational listservs (Ahuja & Galvin, 2003), FLOSS development communities (Qureshi & Fang, 2010), and usenet forums (Burke, Kraut, & Joyce, 2010).

2.2.3 Legitimate Peripheral Participation

One theory that is used extensively in research on the experience of newcomers to participatory platforms is Lave and Wenger's theory of legitimate peripheral participation (Lave & Wenger, 1991). Under this theory, work and social spaces are envisioned as comprising an essential core group of members and practices and a group of less important members and practices at the periphery. Legitimate peripheral participation (LPP) addresses the conditions for learning that help newcomers to a community move from the periphery of a community toward a more central role as entrenched and valued members of a community. Central to the theory of LPP is the idea that newcomers operate on the periphery of a community, a setting where low barriers to participation make it easy for a newcomer to observe existing practice and make small contributions of their own. The idea of peripheral participation and the low barriers to observation and participation have indeed been instrumental to scholars in describing the space and conditions for newcomer learning on participatory platforms. For

example, LPP can be used to describe the peripheral conditions of an open source software project, where a new contributor might begin by observing how existing members write and talk about software while also making small contributions by filling out bug reports. By observing ongoing work and conversations about work, and making small contributions that do have major implications to the broader functionality of the project, a newcomer is given “an opening, a way of gaining access to sources of understanding through growing involvement” (Lave and Wenger, 1991, p. 37).

Studying how communities provide access for newcomers to engage in practice helps researchers understand learning trajectories of members as they relate to the production and reproduction of a community's practice (Østerlund & Carlile, 2005). For example, much of what Lave and Wenger focus on when studying the activities of newcomers is how they are given access to participate in and observe daily routines. Focusing on how newcomers have access to observe ongoing practice, Lave and Wenger describe a scenario from their research where apprentice meat cutters did not have access to expert butchers to observe them in their work. In this example, Lave and Wenger talk about the layout of the workspace where the experienced meat cutters are behind a wall, out of the newcomers’ sight . This lack of access for observation resulted in the new meat cutters having more difficulty learning how to engage in more involved and important practices (Lave & Wegner, 1991). Building on this theme of access to practice, research on newcomer participation in open source software production has shown that a lack of access to observe ongoing practice is a major obstacle for newcomers’ learning how to participate (Hannebauer, Book, & Gruhn, 2014).

While peripheral participation has helped to explain how newcomers learn in settings with low barriers to participation, (e.g., Antin & Cheshire, 2010; Bryant et al., 2005; Halfaker, Keyes, & Taraborelli, 2013b; Mugar, Østerlund, Hassman, Crowston, & Jackson, 2014; Preece & Schneiderman, 2009), researchers, with few exceptions, have not taken on a more nuanced approach to examining the sociotechnical conditions that make observation and participation possible at the periphery of platforms. For example, how do platforms reveal and make transparent the ongoing activity, or how do platforms make various forms of participation available to newcomers? The sociotechnical conditions of participation on these platforms are deliberate decisions by those who create and manage their infrastructure, yet opportunities to contribute and observe at the periphery are conditions that are seemingly taken for granted. As the following section will show, there is a growing body of research suggesting that, while newcomers face low barriers to initial participation and must seek out information on how to participate, the peripheries of participatory platforms are in fact well managed and intentional spaces that play a part in shaping how newcomers learn and contribute.

2.2.4 Moving Beyond Individualized Learning at the Periphery

Theories of organizational socialization and learning have been integral to how scholars frame the conditions of the newcomer experience to participatory platforms. While the framing of the newcomer experience as an individualized experience at the periphery of a platform has helped in examining newcomer learning in unique and novel organizational settings, concepts like individualized socialization, proactive tactics, and peripheral participation are grounded in configurations of work and practice defined by conditions that are distinct from those of online participatory platforms. While participatory platforms indeed resemble traditional hierarchical

forms observed in traditional firm-based face-to-face models, the voluntary, distributed, and asynchronous nature of work, as well as the infrastructure that supports it are different. Saying this is not meant to invoke an artificial dualism between a world that exists in a digital sphere and one that does not, rather it is intended to suggest that there are unique and distinct affordances and constraints in the participatory platform setting that support social formations that concepts developed outside, prior to, or without consideration of such affordances may struggle to fully capture. As the following section will describe, there is a growing body of research on the newcomer experience that recognizes the limitations of current conceptualizations of individualized and institutionalized tactics and low barriers to participation and the ways they do not accurately capture how platform experts and leaders manage the periphery of participatory platforms.

2.3 Research on Newcomers to Participatory Platforms

The question of how newcomers learn to contribute in settings that have low barriers to participation is a central question to understanding the success of online participatory platforms. Like any organizational phenomenon, the perpetuation of a core practice is integral to the long-term success and stability of the project, and ensuring that new members are integrated into existing practice is an essential part of that success. Building on the theories and concepts described in the previous section, researchers have produced valuable insight into what this experience looks like. However, the superimposition of these concepts onto online environments is becoming increasingly problematic. In particular, how do we describe management strategies that achieve the outcomes of institutionalized socialization tactics but do so using individualized tactics? In this section I review three themes from research on

newcomers to online participatory platforms and highlight the growing evidence of the ways in which the conditions of participation at the periphery challenge existing understandings of newcomer socialization and learning.

2.3.1 Feedback

Building on the concept of proactive tactics, scholars have examined the role that feedback plays in the newcomer experience. Broadly, feedback has been shown to encourage continued participation beyond newcomers' earliest contributions (Burke et al., 2009; Choi et al., 2010; Joyce & Kraut, 2006). However not all feedback is created equal, and in some cases, feedback can be the source of a newcomer leaving a project altogether.

Feedback can have an affirming quality, pointing out to newcomers that their contributions are valued and that the community will benefit from them in some way (Arguello et al., 2006; Zhu et al., 2013; Burke, 2007; Zhu, Zhang, He, Kraut, & Kittur, 2013), while on the other hand, feedback can be negative and can discourage newcomers from continued participation, often having damaging effects to the volunteer pool of a community (Halfaker, Kittur, & Riedl, 2011; Steinmacher, Silva, Gerosa, & Redmiles, 2015). For example, researchers have looked at how the reversion of a newcomer's edit on Wikipedia can have both negative and positive consequences for newcomers, with some newcomers becoming discouraged and leaving the project after their work was removed, while other newcomers return to improve on the work that was removed (Halfaker et al., 2011; Zhu et al., 2013).

To unpack the implications of different types of feedback types on newcomer participation, researchers have tested how the content of messages can impact subsequent participation by newcomers (Faulkner, Walling, & Pinchuk, 2012; Geiger et al., 2012; Singh &

Kathuria, 2012). For example, research has shown how feedback with language that is personalized to the particular user results in a higher rate of retention than feedback that simply provides a directive on what the newcomer needs to do but does not feature any personalized content (Faulkner et al., 2012; Geiger et al., 2012). Similar research has considered the difference between negative and positive tone in language, with findings pointing to higher rates in retention for those newcomers that receive messages with positive language (Singh & Kathuria, 2012).

Recognizing that the environments which newcomers find themselves in can often be hostile toward new members (Halfaker et al., 2011), scholars have also looked at the context in which newcomers seek and receive feedback. In the case of Wikipedia, Morgan et al. (2013) created the Teahouse, a safe space for newcomers to seek out support and learn more about participating in Wikipedia. Here newcomers can feel free to ask any questions they have with some assurance that they will receive polite and helpful feedback. Comparing newcomers who did and did not use the Teahouse, researchers find a significant difference in continued participation, with Teahouse users staying with Wikipedia for a longer period (Morgan et al., 2013). Looking at the context of feedback from the perspective of those who give it, researchers have explored how various platform features on Wikipedia frame newcomer activity in both a negative and generalized light, avoiding a more nuanced and welcoming tone that recognizes that newcomers make mistakes and don't intentionally damage the project through incorrect contributions (Halfaker et al., 2014). To redress this, Halfaker et al. (2014) created a tool that detects newcomer edits and rates them on a scale from potential vandalism to innocent mistakes. To reflect the varying motivations for incorrect work, the tool also offers

the user a range of template messages that cultivate newcomers who made mistakes in good faith and conversely, sternly notify those editors who are there to cause trouble.

Much of the research that has been conducted on the newcomer experience in online settings has focused on online discussion groups and peer production settings. In both cases, formal training is not required of newcomers before they can participate, demonstrating that there are no institutionalized newcomer onboarding experiences in place. This point is indeed emphasized in some of the research and can be viewed as part of the motivation to focus on feedback as a tactic for newcomers to make sense of their new settings as well as for existing members to help newcomers become acclimated to the standards of practice. Because of the lack of institutionalized newcomer onboarding procedures that define the research settings, the focus on feedback emphasizes the individualized dimension of socialization described in Jones (1986) as well as the proactive tactics described by Miller and Jablin (1991).

While the research on feedback is described as a necessary condition of the individualized newcomer experience on open online platforms, some of the research on feedback complicates the dichotomy of individualized and institutionalized socialization tactics suggested by Jones (1986). As the research by Choi (2010), Gieger et al. (2012), Morgan et al. (2013) and Halfaker et al. (2014) suggest, the individualized experience of newcomers receiving feedback on Wikipedia is tied to emergent institutionalized tactics regarding how to welcome newcomers. For example, Choi et al. (2010) identify themes in how members of different content projects interact with newcomers, such as approaches to assigning tasks or inviting them to join the content project. The work of Morgan et al. (2013) also suggests attempts at creating a space on Wikipedia where clearly established norms of how to interact with

newcomers are promoted and upheld. In the work of Halfaker et al. (2014), we see algorithmically driven tools that have standardized the detection of particular forms of behavior and provide options for template responses for such behavior. For Geiger et al. (2012), the role that fully and semi-automated tools play in facilitating the connection and interaction between existing members and newcomers suggests a “Regime of Socialization,” or an overarching context that frames the deployment of individualized socialization tactics. Such regimes of socialization and emergent approaches to responding to newcomer feedback complicate the distinction between individualized and institutionalized socialization in that they work to provide a common experience for newcomers, with nearly 80% of new editors receiving a template message as their first form of feedback on Wikipedia (Geiger et al., 2012).

2.3.2 Building Relationships

Participatory platforms are not devoid of politics, and newcomers that wish to move beyond making small contributions toward making more impactful contributions often come up against the political reality of projects. Understanding how newcomers establish relationships with experienced members is another prominent theme in research on newcomers to participatory platforms.

As a new member moves from making small contributions toward making larger and more impactful contributions to a project, they may face the phenomenon of social gatekeeping. In examples of social gatekeeping, new members must demonstrate their value to and build relationships with experienced and recognized members of the project who vet, endorse, and support the newcomers. Newcomers demonstrate value to the community in a number of ways. They may draw on “joining scripts” or protocols that they use to demonstrate

their value to the community (Krogh, Spaeth, & Lakhani, 2003). Such scripts involve making direct requests to be given new status in a project that allows them to make types of contributions that they do not have access to. Other joining scripts that attract the attention of experts include providing autobiographical testimonials and posing direct questions, both of which are correlated with a higher likelihood of getting a response from expert community members (Arguello et al., 2006; Burke, Joyce, Kim, Anand, & Kraut, 2007). Through experimental methods, researchers have found that making group oriented membership claims, or demonstrating a commitment to the goals of the project, is the most effective way for newcomers to garner the attention of established members (Burke et al., 2010). An even more direct path toward demonstrating their value is ongoing participation in the forums of a project, talking about the work in a way that highlights the newcomer's knowledge about the work in question (Fang & Neufeld, 2009).

While demonstration of work may suffice on some platforms, other researchers have observed that newcomers must also receive the endorsement of expert contributors, who make the case to other established members that the newcomer has the potential to be a valuable member to the project (Coleman & Hill, 2005; Ducheneaut, 2005). Establishing relationships with experts can lead to different trajectories of participation, where, regardless of the expertise that a newcomer brings to the project, the relationships they build with experts can result in varying timeframes for moving from peripheral to core participation, with some newcomers getting fast tracked to core participation and others taking more time (Qureshi & Fang, 2010).

Whether the newcomer is described as deploying scripts to garner the attention of existing members or proving their worth by demonstrating their competence as coders in a F/LOSS community, the newcomer experience in the literature on relationships building is described as individualized. Drawing on the proactive socialization literature (Ashford & Black, 1996; Gruman, Saks, & Zweig, 2006; Miller & Jablin, 1991; Saks & Ashforth, 1997b) adds to this perspective of an individualized experience with underlying assumptions that a newcomer does not have access to any formal onboarding experience and that their successful socialization is a product of their information seeking. This research also draws on the theory of legitimate peripheral participation, emphasizing individual trajectories of participation that are defined by changing relationships with experienced members. While the newcomer experience is often a product of an individual's own exploration and work, the idea of joining scripts, endorsements, and other more formal requirements described in this research suggest there are indeed common experiences that tie the experiences of newcomers together in these projects, drawing them toward commonly accepted approaches to doing work. Such examples complicate the dichotomy between individualized and institutionalized newcomer socialization, suggesting that while newcomers may need to build relationships on an individual basis in order to become part of a community, the steps toward building such relationships exhibit institutionalized procedures that create shared experience for many newcomers.

2.3.3 Access to Practice

Drawing on the conditions for learning described in Lave and Wenger's theory of legitimate peripheral participation, researchers have examined the different ways platforms make practice and observation of practice available to newcomers at the periphery. While participatory

platforms are characterized by low barriers to participation, the theme of access to practice offers valuable insight into how the experts and leaders of participatory platforms curate the newcomer experience, defining how they learn and participate in such a way that reflects the goals and ideals of the project.

Access to Participate in Practice

With relatively few exceptions, newcomers can make changes to articles on Wikipedia even as unregistered users. Newcomers can start off by making small edits like correcting spelling or grammar before they move on to making more substantial contributions like editing articles on project policy (Bryant et al., 2005). Similarly, newcomers to F/LOSS projects can contribute by submitting reports about fixes that need to be made in the code, called bug reports (Østerlund & Crowston, 2013; Wang & Sarma, 2011).

While starting off with small contributions reflects the learning experience of many newcomers, participatory platforms like Wikipedia do have features that resemble tutorials. One prominent example is the Wikipedia Adventure, where newcomers are guided through making edits to a mock article that exists only in the tutorial space, separate from the rest of Wikipedia (Narayan et al., 2015). Similarly, the citizen science project Planet Hunters features a tutorial that all newcomers are required to take that provides a guided and simulated experience of contributing to the project (Mugar et al., 2015; Østerlund, Mugar, Jackson, Hassman, & Crowston, 2014). Operating as a separate entity to the Wikipedia community, the Wikipedia Education Initiative draws newcomers to Wikipedia through college classrooms, where students are required to go through a fixed curriculum that not only teaches students

how to contribute to Wikipedia, but shapes the process of their work throughout the course of a semester (Lampe, Obar, Ozkaya, Zube, & Velasquez, 2012).

Access to Observe Practice

Often described as lurking, newcomers start out by observing how others participate before they make their first contribution (Bryant et al., 2005; Preece & Schneiderman, 2009; Preece, Nonnecke, & Andrews, 2004). Researchers explore how the design of a platform makes available examples of varying forms of practice for the newcomer to observe (Bryant et al., 2005; Preece & Schneiderman, 2009). For example, the edit history and the syntax viewer for an article on Wikipedia provides examples of what participants are contributing to an article and the code that is involved in making those contributions.

In some cases, newcomers face obstacles to learning when they do not have access to observe the practice of other participants (Hannebauer et al., 2014). In such cases where there is limited access to observe practice, newcomers may look to other resources to find examples of conventional participation. On Planet Hunters, a crowdsourced citizen science platform, newcomers are not able to see the contributions of other volunteers and therefore often rely on the comments left by volunteers that describe the work they did (Mugar et al., 2014). In addition to looking at comments about participation, newcomers to Planet Hunters also look to curated examples of participation, where the scientists that run the project pull together examples of work that reflect project goals for new contributors to examine (Mugar et al., 2015).

While the research on the role of access to observe practice is rooted in the idea of observing live participation, a growing body of research suggests that platform experts and

leaders are curating examples of work that newcomers can observe (Mugar et al., 2015; Narayan et al., 2015; Østerlund et al., 2014), demonstrating attempts at shaping the newcomer experience in a way that reflect institutionalized socialization strategies, where all newcomers get the same experience

2.3.4 Complicating the Dichotomy of Socialization Tactics and Low Barriers to Participation

The application of theories from organizational socialization and learning theory to online settings, while useful, does come up against obstacles as the shape of online production evolves and mutates into different phenomena. As this review of literature suggests, the dichotomy of individualized and institutionalized socialization and LPP, which has framed much of the research, does not map precisely to the phenomenon of the newcomer experience on participatory platforms.

Broadly, the research demonstrates how newcomers do have an individualized experience where they begin making small contributions, observing ongoing practice and interacting with existing members. However, in this experience, newcomers do encounter both content and contexts that are aligned with institutionally sanctioned definitions and modes of participation, constraining a newcomer's agency as it relates to learning and contribution.

Examples like those provided by Geiger et al. (2012) suggest that while newcomers to Wikipedia must learn on their own, they are confronted with a regime of socialization or standardized approaches taken by project members to contend with work by newcomers that do not fit acceptable forms of practice. This regime of socialization suggests a learning experience that does not cleanly fit in either end of the individualized-institutionalized

dichotomy in that it both accommodates an individualized learning experience while also executing an institutionalized approach to providing feedback to newcomers. Mugar et al. (2015) similarly highlight how access to observation on Planet Hunters is curated, with newcomers being presented a vision of ongoing work in the project as determined by the leaders of the platform. In this example, while newcomers may start participating immediately, doing so outside of a cohort, the context of their learning is collective in that all newcomers are receiving the same information through the curated examples. In such an example, we observe how the distinction between institutionalized and individualized socialization tactics becomes murky.

From shaping how they contribute to a project, keeping newcomers separated from the main project while they learn, to observing ongoing participation through the lens of project leaders who provide curated examples of participation, the low barriers to participation are indeed complemented by a well-defined newcomer experience that guides them toward the interests of the leaders and experts of the platforms. The examples highlighted in this chapter point to how current concepts used in research on the newcomer experience do not have the analytical flexibility needed in order to reconcile what is at once an individualized and institutional experience. In the following section, I propose the use of a sociomaterial theoretical perspective that examines the relational conditions of human agency and the ways it might help define both how experts and leaders define the conditions of peripheral participation and learning as well as how newcomers negotiate such conditions. By using this sociomaterial perspective, I suggest that we can pivot away from the view that the newcomer experience is uniquely informal and community driven, toward a hybrid conceptualization of

learning that oscillates between poles of individualized and institutionalized newcomer experiences.

2.4 Reimagining Opportunities for Learning and Participation

In order to reimagine what the newcomer experience looks like on participatory platforms, it is important to take a step back from thinking about what an individual does to learn or what an organization attempts to do for newcomers, and instead reframe the question by asking how opportunities for learning are made available to newcomers.

As the research in the previous section has highlighted, there are a range of opportunities on participatory platforms that define how newcomers can learn about and contribute to a project. For example, a newcomer might start off making small contributions to Wikipedia and then find themselves being recruited to interact with friendly experts in the Teahouse, or a newcomer, after asking for code-committing privileges to an open source software project, might find themselves appealing to experts and demonstrating their value to the project. As I argued toward the end of the previous section, these examples cannot be taken for granted in that they reflect explicit attempts by the leaders and experts to define the conditions of participation at the periphery of platforms.

By focusing on how opportunities are made available, the empirical focus shifts to the situation in question and the conditions that reflect the affordances and constraints that contribute to the experience of the newcomer. The idea of investigating how opportunities to participate in learning are made available to people is motivated by a growing conversation described in the first chapter that scrutinizes and investigates what participation really means in the broader phenomenon of digital participatory culture and how platforms work to

constrain and define the way people can contribute toward ends defined by platform experts and leaders. While the motivation to reimagine what the peripheral conditions of participation look like is well established, what is needed is an empirical framing of how to approach this work in such a way that accurately reflects what can be described as a hybrid of institutionalized and individualized socialization tactics. To do this I turn to the field of Science and Technology Studies, and in particular, Estrid Sørensen's ethnographic investigation of education in a blended learning environment (Sørensen, 2009). In her work, Sørensen examines how the agency of a student across various classroom situations is constructed based on what she describes as the configuration of relationships students have with both human and nonhuman actors in that setting. For example, Sørensen draws a sharp distinction between the agency of a student in a setting where they are in a classroom using the internet to participate in a collaborative project that occurs in an online virtual world, versus moments when students are sitting at their desks, facing the teacher who is giving them instructions on a chalkboard. In the case of the online virtual world, a student is able to escape the teacher's authoritative gaze and can do whatever they wish, whereas when they are sitting at their desk in the classroom, the student cannot escape a teacher's control. In each example, Sørensen examines the patterns of relationships that emerge between the human and nonhuman entities (e.g., chalkboard, desk, textbooks) in that setting and how they all play a part in constructing various characteristics in the agential constraints and affordances of the students.

This question of how agency is constructed in a classroom setting is relevant to research on the newcomer experience and the goals of research on organizational socialization and learning in that they are all focused on the question of subjectivity. By investigating subjectivity,

Sørensen is interested in the question of the social and material forces that converge upon and shape how people navigate, negotiate, and engage the world. Subjectivity, or the idea of the subject as something that is perpetually constructed, is relevant to the question of organizational socialization and learning in that these topics are also concerned with how people negotiate and position themselves within existing modes of operation. Therefore, to examine how subjectivity is performed also concerns the concept of agency, or the constraints and affordances that an individual navigates as they move through the world.

Before defining how Sørensen examines the construction of opportunities for learning, it is important to first briefly reflect on the scholarly lineage of her work in Science and Technology Studies (STS) so as to understand the overarching methodological and ontological perspectives that motivate her research and in turn, influence the research in this thesis.

[2.4.1 Science and Technology Studies, Actor Network Theory, and Sociomateriality](#)

From explorations into the production of scientific knowledge in a laboratory to the creation of particular pieces of technology, STS scholars show that the appearance of stable scientific fact or a standard artifact is the outcome of ongoing and active social negotiations (Sismondo, 2008). For example, how a scientist observes nature and reports on their findings is a process that takes place through negotiations between scientists in a lab, reflecting the lab's culture and politics (Cetina, 1999; Latour & Woolgar, 1986; Traweek, 1988). Similarly, the design of a bicycle as we know it today can be unpacked by tracing a series of political power plays, failed designs, the availability of materials, and a strong network of consensus amongst various actors that has led to what we now view as a standard bicycle design (Pinch & Bijker, 1984). Beyond a focus on technology and science knowledge, the constructivist perspective of STS has expanded

to take on such issues as classification systems (Bowker & Star, 2000) the boundaries of scientific disciplines (Gieryn, 1983), and financial markets (Callon, 1999). For STS scholars, the world that we observe is never a matter of fact, but a matter of an ongoing active process of social and material relationships that converge to produce what we see in front of us. In short, STS can be said to focus on the production of standards and norms across varying contexts (Sismondo, 2010) as well as the controversies that challenge the stability of such norms and standards.

A prominent theoretical and methodological approach in STS research that is used to examine the constructed nature of phenomena is actor network theory (ANT), which starts with the premise that the observed agency, form, and attributes of actors, either human or nonhuman, and the observed related phenomena are a function not of inherent qualities of the actors but of the networked relationship between the actors. ANT, therefore, holds that there are no distinct social or technological elements that shape each other; rather, social and technical elements should be analyzed as being equally influential in a network of human and nonhuman actors. ANT also assumes that social actors build networked relationships with other actors in order to achieve particular effects. Thus, to describe a social phenomenon is a process of tracing the network of relationships between actors, both human and nonhuman, and the ways in which such relationships align to produce particular effects. Such networks consist of heterogeneous actors, ranging from material equipment to institutional norms embedded in written policy. The heterogeneity of the network is important to note as it is reflective of ANT's position that both humans and technology should be treated symmetrically when analyzing the impact that either has in the network.

In his work on the creation of the diesel engine, Latour describes how Rudolph Diesel initially thought that he could build an engine for any type of fuel, assuming that all fuels under sufficient pressure will ignite. In creating this engine, he assumed that an alliance with any type of fuel would work, however, as Latour describes, this alliance with any type of fuel was betrayed when fuels did not act the way he had hoped. As a result, Diesel had to create a new set of alliances in order for his engine to succeed (Latour, 1987). What this example demonstrates is that the alliances, or network of relationships, were integral to how we understand the construction of Diesel's engine.

Perhaps one of the most valuable analytical assets of ANT is that it helps attend to the role of materiality, or nonhuman actors in the organization of social phenomenon. Understanding human activity at scale often requires understanding how people delegate agency to nonhumans and how humans and nonhumans affect each other in these relationships (Sismondo, 2010). Using anecdotal examples such as speed bumps in a road, Latour (1991) describes how norms that can be upheld by human interaction, in this case a traffic cop monitoring the speed of vehicles, can be translated into the design of technologies that in turn reflect such norms when they are connected with human action. In another example, Latour describes the design of European hotel keys as a reflection of how the work of a hotel manager asking their guests to leave their keys before they depart the hotel is delegated to the large and bulky weight attached to the key:

Customers no longer leave their room keys: instead they get rid of an unwieldy object that deforms their pockets. If they conform to the manager's wishes, it is not because they read the sign, nor because they are particularly well-mannered. It is because they cannot do otherwise. (Latour, 1991, p. 105)

For Latour, the hotel key example is a description of how social demands are translated to technology and how the network of relationships between the hotel manager, the guests, and the weighted key converge to form a particular outcome. Other examples used by Latour to describe this networked relationship between technological and human actants include descriptions of alarms that remind drivers to put on their seat belts in a car. As described by Latour, the alarm reminding him to put on his seatbelt is reflective of a societal norm about wearing a seatbelt delegated to technology (Latour, 1992). The example given by Latour demonstrates how social agreements can be delegated to technology and in turn how human actors interact with the technology in the perpetuation of particular effects.

By paying attention to nonhuman actors, ANT unveils how materiality plays a role in the construction of human agency. As ANT analyses reveal, the more we delegate specific social agreements to technology, the more we create situations where materiality affects how humans operate in the world (Sismondo, 2010). Indeed, ANT is as much a methodological proposition as it is an ontological one. To consider phenomena as co-constructed with the participation of humans and nonhumans points to what can be described as a sociomaterial ontology, where we view phenomena as the performance of social and material discursivity.

It is this sociomaterial ontology that motivates the work of Sørensen who takes this approach to her research on how technology factors into the configurations that define the learning experience of students in the classroom. Sørensen justifies her motivation to take a sociomaterial approach to her research by pointing out that education and learning researchers often look at the role of technology after they have investigated the conditions that define how children learn. Instead, Sørensen wishes to examine how technology plays a part in the

conditions that define the settings and experience of learning. Sørensen notes that perhaps the theories we have about learning are such because “we have certain learning materials in mind when we account for learning, or at least that the learning materials in use influence the formation of learning and affect our thinking and theorizing about education in general” (Sørensen, 2009, p. 7).

Building on Lave and Wenger’s theory of situated learning, Sørensen’s research looks at the various ways opportunities to participate in learning are made available to people. Sørensen motivates her theory based on two key concerns with assumptions in Lave and Wenger’s theory: The first issue is with the assumption that learning and knowledge are performed exclusively by relationships with other humans. Speaking to the humanist perspective of learning perpetuated by Lave and Wenger (1991), Sørensen points out that, by focusing on the idea that knowledge and learning are performed by a set of relations among persons and activities in the world, they overlook the possibility that situated knowledge may vary depending on the different materials or nonhuman actors involved in that setting. By “rendering materials irrelevant it is possible to insist that knowledge as part of a set of relations among persons, activity, and world takes only one form” (Sørensen, 2009, p. 92). The second issue is with Lave and Wenger’s assumption that learning takes place along a trajectory. This imagined trajectory, along which we chart learning and the changing relationships with a community of practice, describes learning as being part of a well-defined education system. However, as Sørensen notes, “learning practices are rarely concerned with the educational process as a whole, but rather directed toward continuing and completing the particular practice in question” (Sørensen, 2009, p. 172). By focusing on learning as being part of a

trajectory of changing relationships, Lave and Wenger (1991) neglect how individual moments of learning practice each have varying configurations of relationships and therefore reflect various ways that opportunities for learning are available.

To explore the different sociomaterial configurations of relationships that define opportunities for learning, Sørensen departs from the traditional focus of ANT on stabilized networks of actors and instead aligns herself with a more contemporary movement in ANT scholarship that examines how configurations of actors vary from context to another. For example, Law and Mol (2001) focus on the configurational variance of objects, or the mutable mobile, defined as a condition in which the network that defines an object changes depending on the setting. In their analysis of the Bush Pump, a water pump used in Zimbabwe and Namibia, they point out that the definition and functionality of the object adapted itself as it moved through different contexts, serving different purposes as it found itself aligned with a range of different actors from one context to the next. Describing the pump in contrast to Latour's immutable mobile (1990) Law and Mol consider the shifting relationship of the pump, or the configurational variance, as it moves through different settings. Law describes examples like the Bush Pump as a fluid object because it is involved in ad-hoc adaptation based on new settings (Law, 2002). Drawing on the work of Mol and Law, Sørensen suggests that ANT analyses look less at the individual components, such as the technologies, people and practices and relations between the components, and instead focus on the patterns and characteristics that emerge from the relationships between actors and the effects that these patterns produce (Sørensen, 2009).

To analyze the patterns that emerge amongst actors across different contexts, Sørensen builds on Lefebvre's (1991) work on the production of social space, described as spatial imaginaries. For Sørensen, the use of spatial imaginaries works to describe containers or formations of human activity that are created through a web of human and nonhuman relations (Sørensen, 2009). These descriptions of relations in space describe such aspects as "the relations among the parts; the stability of the space and its dissolution, displacement, mutation, and demarcation; how differences and similarities emerge; the norms of the space; which form the space takes" (Sørensen, 2009, p. 76).

In describing the characteristics of space, Sørensen examines presence, a term that reflects the characteristics of "spatial arrangement of social and material entities through which certain ways of participating are made available" (Sørensen, 2009, p. 138). By exploring how various configurations make participation available, Sørensen's approach affords an analytical flexibility that can help us look beyond strict notions of learning in institutionalized or individualized contexts (Jones, 1986) or contexts where learning is uniquely defined by relations with other humans (Lave & Wenger, 1991) to imagine new configurations and formations of learnings that can help make sense of how authority and structure can exist in settings where it traditionally seems difficult to impose.

2.4.2 Sørensen's Forms of Presence

Emerging from her observation of a blended learning environment, where students are engaged in learning across a traditional classroom setting and an online virtual world, Sørensen generates three spatial analyses that describe the characteristics of relationships amongst humans and nonhumans. Across these three spatial forms, Sørensen looks at such aspects as

“the relations among the parts; the stability of the space and its dissolution, displacement, mutation, and demarcation; how differences and similarities emerge; the norms of the space; which form the space takes” (Sørensen, 2009, p. 76). By describing the characteristics of space in the blended learning environment, Sørensen defines varying forms of presence, or how social actors perform in such spaces, and is able to demonstrate how learning takes various forms depending on different forms of presence. Based on her findings, Sørensen develops three forms of presence: collective, authority-subject, and agent centered (see Table 2.2). Each form of presence examines the configurations and characteristic of relationships that learners have with other humans and nonhumans and the different ways learning takes place.

	Collective	Authority-Subject	Agent Centered
Limitations	Blurred demarcation	Boundaries	Discontinuities
Interpersonal relations	Symbiotic	Mutual	Shifting between intimacy and isolation
Power relations	Entangled	Characterized by dominance and subjection, rejection, restriction	Characterized by equality, affirmation, allowances
Authority	No authority	Fundamental, ubiquitous	Procedural, last step, influencing the next
Ways of learning	Collective mutation	Imitation, transmission	Active collaboration, participation

Table 2.2 Forms of Presence (adapted from Sørensen, 2009: 173)

Collective Presence

Sørensen draws on Johan Asplund’s (1985) definition of a collective, which comes from his description of medieval peasant society where participants in a collective were directed toward each other and not toward something apart from them in either space or time (Sørensen, 2009:143). In a collective “There was no clear boundary between the one and the collective and

hence no individual stood out from the crowd” (Sørensen, 2009, p. 143). Sørensen uses this idea of the collective to describe the relationships between students at a moment when they are standing in a circle and singing a song together in the classroom. In this example, she describes how the relations among the students and teachers were:

...constituted through the common singing and through letting their eyes and bodies meet...the ubiquitous sounds of the song, the continuously traveling gazes, the eye contact, and the smiles performed connections among pupils. They drew the singing together. By mutually drawing one another together, the song, traveling gazes, eye contact, swaying bodies, and smiles performed a collective. (Sørensen, 2009, p. 142)

In collective presence, learning is most similar to the definition of situated learning, where knowledge and learning are performed by people working together on tasks that resonate with the core identity of a community. In the example of students singing, learning is a matter of everyone converging around a common way of doing a task together, with knowledge being produced when everyone is in sync, achieving consensus, singing the same words, and humming the same tune together. For collective presence, the attention of the learner is directed to other learners such that the relationship between actors does not produce any single individual who acts as an authority determining the direction of any other actor. The power dynamics in collective presence are entangled in the act of everyone working toward the same goals and, similarly, with limitations of activity being defined by this collective consensus.

The emphasis on joint engagement in practice in collective presence is most aligned with existing descriptions of a newcomer’s experience as a trajectory of participation where new members become increasingly embedded in a project, strengthening their relationship with members and tasks of the project in question. Collective presence’s emphasis on shared experience reflects Lave and Wenger’s description of situated learning, where access to

observing the work of others as well as getting feedback from other participants about shared project goals help to align the newcomers with project standards and objectives.

Collective presence is already reflective of existing descriptions of how learning takes place on participatory platforms, however it does offer an opportunity for examining the overlap between institutionalized and individualized socialization practices. For example, as I describe in my review of the literature, research focuses on the importance of observing salient examples of participation as being crucial to newcomer learning. Just as important is the feedback from existing members. While such examples are situated within an informal setting, where the newcomer is part of the project and making contributions, the feedback and mentorship they receive from existing members resembles key features of institutionalized socialization tactics, such as investiture tactics, where newcomers receive feedback and mentorship for their work. Observing ongoing work also reflects a feature of collective socialization tactics in that without access to observe activity, newcomers struggle to learn how to contribute (Hannebauer et al., 2014). By reflecting on the relational characteristics of collective presence, the description of the newcomer experience in online communities provides insight into the ways that institutionalized and individualized tactics overlap to support newcomer socialization.

Authority-Subject Presence

Sørensen draws on Althusser's concept of interpellation, or the means by which ideology works to reproduce state power (Althusser, 1971). For Althusser, interpellation is an action, a moment in which people recognize themselves as subjects to a particular ideology. In a moment of interpellation, Althusser proposes that we are called to by an authority, a police officer for

example, and in the act of turning around and recognizing ourselves as being called to, we respond and become subject to that authority, immediately defined by conditions that they have imposed on us. Relevant to Sørensen's use of interpellation is how Barney et al. (2016) build on the idea of interpellation to describe conditions of participation. Describing interpellation as an ideological hailing, we find ourselves operating within a unique and established set of participatory conditions when we are called upon to participate within and become subject to a particular set of ideological constraints (Barney et al., 2016). For Sørensen, interpellation helps to describe those moments when opportunities for participation and learning are defined by a distinctly authoritative presence, where two opposites are separated by distinct regions of participation, related and co-constituted to create conditions where one is an authority and the other is subject to that authority.

In the previous description of students singing a song as a form of collective presence, their attention was directed toward one another, with no one person standing out as a leader or authority in the setting. In the following example of another song that the students sang in the class, the interpersonal relationships and attention shift. In her description of students singing an alphabet song, Sørensen describes how the students are all sitting in their seats, not facing each other but instead facing the front of the classroom, with their attention converging on the teacher at the front of the class, who is writing the letters down on the blackboard as the students recite them. Sørensen describes how the students are all related not only by the fact that they are all looking at the same letters on the same blackboard, but by the matched rhythm of the song they are singing which is coordinated with the emergence of the letters as the teacher writes them. "Due to the coordination of the rhythm of the song and the emerging

letters on the blackboard, a rather strong one to many relationship was performed in which several elements were precisely calibrated to contribute to the same pattern of relations” (Sørensen, 2009, p. 143).

Unlike the conditions in collective presence, the attention of the students is not fixed on one another, rather they are all fixed on one object, the blackboard-teacher, which stands out from the rest of the bodies in the class as an authority directing the activities of students.

The letters on the blackboard were the center of attention. The teacher and the emerging visual materiality of the letters she was writing on the blackboard co-constituted one single and central geographic place to which the pupil’s attention was drawn. (Sørensen, 2009, p. 141).

This focus creates an internal separation among the students, with one person (the teacher) standing out and dictating the moves or activities of the students. This focal point is where authority exists because the students are orienting and matching their behavior to the commands that emerge at the location of the blackboard and teacher. By creating this internal separation, a division is created in the group, establishing the “here” and “there” for the student’s lines of attention that go from their desks to the location of the teacher and the blackboard at the front of the classroom.

By describing the creation of a here and there in the lines of attention between the students and the teacher, Sørensen defines two distinct regions of participation in the classroom, each associated with established, approved, and homogeneous sets of activities, events, and objects. One region is occupied by the teacher who stands at the front of the classroom in control of the chalkboard, opposite the other region occupied by the students,

sitting at desks oriented toward the front of the classroom where the teacher and the blackboard reside.

Participating in the performance of these two regions is the blackboard, which is “saturated with authority, drawing attention to what was said and done, and to the individual who said and did.” (Sørensen, 2009, p. 148). This regional technology is what helps to produce a boundary between the two regions, which “kept them at a distance from each other, while at the same time they constantly and dynamically co-performed each other as subjects and authority” (Sørensen, 2009, p. 164). Another factor that performs the distinction between the two regions is that participants from these regions seldom overlap, with students occasionally being called up to the blackboard but then being quickly ushered back to their seats.

The restriction of activity in the performance of authority-subject presence is also achieved in the way that the teacher allies herself with the textbooks and other classroom material to create conditions for a homogeneous environment of participation. By assigning the students the same assignments from the same textbook, she can follow and track the activity and progress of the student with a great degree of certainty and predict what they are doing in the classroom. In addition to supporting predictability of the students’ activities, the teacher’s alliance with the textbooks also promotes predictability and homogeneity in the knowledge that students are learning. In authority-subject presence, learning is described as a process of imitating and applying previously tested and approved knowledge from the textbooks. The textbooks promote this homogeneous and predictable knowledge transfer because, in relationship to the students, they are immutable, with students only being able to imitate and apply the content of the textbook to their work because they are unable to change its content.

In light of the existing research on newcomers to online communities, authority-subject presence offers an opportunity to reframe our understanding of the dichotomy between individualized and institutionalized socialization as well as the concept of low barriers to participation. Looking to the work of Geiger (2012) and Halfaker (2014) described earlier in the chapter, the examples of semi-automated tools on Wikipedia used to detect specific behavior and subsequently provide feedback in the form of a template suggests that a newcomer's action already exist within a well-defined region of participation that experienced members are able to predict. In being able to predict the actions of newcomers, existing members have also predetermined the types of feedback that newcomers should receive so that their subsequent actions can be more aligned with existing standards of work. The role of these algorithmic tools in creating a predictable environment of participation along with the templated feedback suggests that, while the socialization tactics are deployed in an informal setting where the newcomer is already participating in the project, the feedback they receive based on their predictable actions draws a parallel to collective socialization strategies, where newcomers receive a common experience so as to create common responses to specific scenarios of participation.

By sensitizing the analysis of the newcomer experience with the relational characteristics of authority-subject presence, focus is placed on the ways the attention of newcomers is gathered and directed toward locations “saturated with authority” and how distinct regions of participation are performed, revealing how the agency of a newcomer is constrained and how institutional practice is perpetuated in settings of ad-hoc and distributed participation.

Agent-Centered Presence

Whereas Sørensen uses Althusser's description of interpellation to define how subjects are produced in relationship to an authority, Sørensen draws on Anthony Giddens's concept of an agent as a way to describe how individuals have causal influence and can exert power and make a difference on their surroundings (Giddens, 1984). In the context of an online virtual world that students at Sørensen's research site were participating in, the idea of being an agent shone through in her field notes.

In the virtual world, students took part in creating the world by constructing buildings as well as the identity of their avatars. The creation of buildings and avatars was done through a combination of copying and pasting URLs and images from the web into the virtual world environment. Students were not given any particular instructions for what URLs or images they were supposed to collect and integrate into the environment; rather, their exploration was motivated by their respective interests. The teacher would at times try to direct the activities of the students however, because of the immense size of the virtual world, it was often only possible to be in contact with only a few students at a time. Being in contact with a student meant the teacher had to be physically co-located with a student in the classroom, standing over their shoulder looking at their monitor, or co-located in the virtual world as an avatar next to a student's avatar. Because the teacher was only able to be in contact with a few students at a time in either the virtual or physical world, the teacher was never able to get an overview of what all the children were doing at once. As a result, unlike the classroom setting where teacher and students were in a constant relationship, students and teacher in the virtual world were sometimes connected and sometimes separated.

This fluid relationship between the students and the teacher did not allow for the teacher to predict how the students would participate in the virtual environment. As a result, the activities in the virtual environment were motivated primarily by the student's interests and went in directions the teacher did not anticipate. This fluid relationship between student and teacher and the inability to predict how participation takes place stands in contrast to description of authority-subject presence in the classroom where the teacher holds the attention of all the students who face her throughout the entirety of the class session. Furthermore, the teacher has a command over the activities the students are engaged in as they all work from the same textbook.

By glancing down at a page in a pupil's exercise book, the teacher got an immediate impression of what the child was doing and how far he had progressed in the book. ...The exercise books defined a clear standard for the sequence of the children's work. Second, all pupils exercise books were in principle identical. Thereby, the teacher knew not just what one pupil was doing but what all pupils were doing. (Sørensen, 2009, p. 162)

Because the teacher could not command the attention or control the activities of the students, no boundaries, regions, or focal points were created as in authority-subject presence. In the performance of agent-centered presence, where students were free to pursue their interests, the only authority that is performed is the way in which students follow each other's lead, building on the previous work of other students. In the example of the students participating in the virtual world, learning is distinct from the examples of authority-subject and collective presence. Here Sørensen refers to the idea of bricolage (Lévi-Strauss, 1966), describing how students piece together elements of their participation as they move through the virtual environment. They try one thing and then another, making connections and bringing disparate components together. This playful exploration is not guided by an outside authority or the

collective, but is a gradual process of participation. It is a process where the last step influences the next and thus gradually mutates over time. This form of learning contrasts with the type performed in authority-subject presence, where the students imitate and replicate authoritative knowledge, as well as with collective presence, where learning is defined by a group consensus.

2.5 Using Forms of Presence to Reframe Existing Research

By focusing on the individual motivations to participate and the aggregate of resources drawn on for learning and participation, the form of agent-centered presence offers a valuable analytical flexibility when studying newcomers to participatory platforms. As research suggests, learning to participate is not only a matter of drawing on resources that exist on the platform in question, but also involves drawing on resources that exist within the learner's broader domain of interests (Mugar et al., 2015). Therefore, we must focus on how a newcomer moves back and forth between different learning resources and how those resources factor into their participation. Similarly, I suggest here that this bricolage form of learning is not only reflective of how a newcomer learns by drawing on outside resources, but also how they build their own learning experience by drawing on a range of resources that exist within a platform and oscillate between different resources throughout their experience.

By focusing on what may seem like a meandering path of participation, we can identify moments where different encounters with learning resources have different effects on participation. For example, if we look at the idea of regimes of socialization proposed by Geiger et al. (2012), we see how newcomers start off participating and contributing on their own volition, but eventually encounter moments where they are confronted with template

messages generated by bots designed to detect particular aspects of contributor behavior. When confronted with messages from bots, newcomers are made subject to the demands outlined in the messages and encouraged to respond to the instructions if they want their work to stay on Wikipedia. In this sequence, the newcomer moves from performing agent-centered presence to being positioned in authority-subject presence, subject to the authority of platform experts who have developed and aligned themselves with templated feedback and algorithms for classifying participant behavior along platform guidelines. In this example, we see how the newcomer experience, while ultimately driven by the motivation of the user, does confront moments where they are made subject to the authority of experts on the platform, showing how the definition of a newcomer's agency changes from one moment to the next. In showing these moments where newcomers are drawn into positions of subjecthood, we see how platforms are able to at once allow for the flexibility of low barriers to participation while also reining in newcomer behavior to adhere to established standards of practice. Such an example also demonstrates the role of materiality, where the algorithms and template messages that factor into a newcomer's experience reflect social agreements among experts about what standards of practice look like delegated to technical infrastructure so that the standards can be upheld at scale.

By drawing on forms of presence, we are equipped with a lens that helps us identify the sociomaterial construction of conditions of participation at the periphery of participatory platforms. In doing so, the analytical focus on the newcomer experience shifts from looking at either top-down institutional strategies of organizations or bottom-up individual strategies of newcomers to thinking about the configuration of relationships newcomers have with other

members and platform features and the effects of these relationships as they relate to different opportunities for learning and participation. By focusing on the different ways learning and participation are made available, forms of presence encourage an approach to exploring how the authority of existing practices in particular settings are imposed on learners, how learners negotiate these constraints on their agency, and therefore how such practices are perpetuated across time and space. Shifting the analytical focus away from the dichotomous lens of socialization research, this research can explore the enactment of institutional (dis)order as it is performed by different configurations of relationships amongst relevant actors, both human and nonhuman and also consider how these arrangements are not mutually exclusive in the newcomer's experience. With these analytical advantages in mind, I propose the following research questions:

- RQ1: How do platform experts and leaders define the conditions of learning and participation on the periphery of platforms?
 - RQ1a: What role do nonhuman actors play in defining the conditions of participation and learning at the periphery of platforms?
- RQ2: How do newcomers negotiate the conditions of participation on the periphery of platforms?
 - RQ2a: How does the agency of newcomers vary throughout their experience on the periphery of participatory platforms?

By shifting this focus to the possibility that the newcomer learning can be described as oscillating between collective, authoritative, and individual performances of participation, this research can explore more precisely how the newcomer experience on participatory platforms reflects an overlap between the traditional dichotomy of individualized and institutionalized socialization as well as account for the role of materiality in the newcomer experience. In doing so, this research can explore the broader question of how platform experts and leaders

maintain low barriers to participation while also constraining newcomer activity so that it meets particular standards of participation. In exploring this question, I will examine the varying conditions and opportunities for participation and learning at the periphery of participatory platforms and how newcomers negotiate these conditions. By answering these questions, we may be able to move beyond the conceptualization that the periphery of participatory platforms is defined by low barriers to participation, and instead attend to the guardrails that actively shape how newcomers learn and contribute.

Chapter 3: Research Design

3. 1 Research Design Overview

Conducting research on newcomers to participatory platform is as much a question of the individual newcomers' experience as it is one of the context in which the newcomer participates. As the questions in the previous chapter point out, to reimagine the experience of peripheral participation requires knowing both how expert members and leaders of participatory platforms define the conditions of participation and how newcomers negotiate these conditions. The focus of my research however is not dichotomous, it is not focused on knowing the peripheral conditions and the newcomer experience as separate units of analysis, rather my focus is on the nexus of the peripheral conditions and the newcomer.

Overcoming the duality of analyzing either the structure or the individual in the social sciences has a long tradition in the practice perspective in sociological and anthropological research. The practice perspective is broadly concerned with the phenomenon of social order and how it is achieved. Unlike other traditions that take either an individualistic approach, looking at how individuals make sense of their new settings (e.g, ethnomethodology, symbolic interactionism) or a structuralist perspective, considering macrostructures that shape how people interact, the practice perspective looks at fields of practice, or the site of activity where structures and individual sense-making tactics converge (Schatzki, 2001). The field of practice is understood as the site of shared understanding of social activity, or social order, where various components and aspects of that site participate in the establishment of order (Schatzki, 2001).

Here, the unit of analysis examines how different components, both human and nonhuman, participate in the effect of stabilizing or destabilizing a particular practice.

Practice-based studies have focused on such topics as the production of scientific knowledge (e.g., Cetina, 1999; Latour & Woolgar, 1986) or the use of medical health records in coordinating communication in a hospital setting (Østerlund, 2007). In these studies, researchers focus on the in situ activity of people, examining not only how people work and interact with each other in the setting of their practice, but also how nonhuman actors, like documents or research instruments, participate in practice. Such studies use ethnographic research methods, which also have a long tradition of use in anthropological and sociological studies that focus on the production of cultural meaning. In the context of studying technology in the workplace, ethnography has been used in computer supported cooperative work (CSCW) research, where ethnographic methods are deployed to understand the situated use of technology, extending the analysis beyond a consideration of the dichotomy of user and technology and focusing instead on broader contextual conditions that are implied in the user experience (Gould, 1988; Hughes, Randall, & Shapiro, 1993). Building on this tradition, I use ethnography as a way to explore my research questions, treating the periphery of participation as a field of practice, a site of research for exploring the production of mutual or divergent understandings of practice and the convergence of components, both human and nonhuman that participate in various forms of sociotechnical (dis)order in the practice of open knowledge production.

Drawing on ethnographic methods for data collection, I also use techniques from grounded theory (Corbin & Strauss, 2008) to analyze my data (explained in detail in section 3.4).

Grounded theory represents an inductive approach to qualitative data analysis that is situated in the tradition of pragmatist and interactionist philosophy, focusing on the action and interaction between entities at the site where meaning is produced (Corbin & Strauss, 2008). The goal of grounded theory is to generate new theory through the analysis of data rather than to use preexisting coding schemes. While this inductive strategy implies approaching data analysis without preconceived notions, more recent descriptions of grounded theory recognize the role of the theoretically sensitized researcher that uses existing concepts to drive their questions and attention in their analysis (Clarke, 2005). Going beyond theoretically sensitized analysis in grounded theory work, I base my analytical approach on what Sørensen describes as a form of analysis that is neither “theoretical nor empirical, neither inductive nor deductive; instead it is methodological” (Sørensen, 2009, p. 13). This methodological mode of research is not intended to produce certainty; it is however used in settings where a researcher wishes to explore and imagine new configurations of practice that allow “new forms of technology, knowledge, presence, and learning to emerge” (Sørensen, 2009, p. 13). The goal of a methodological mode of research is to draw on and create theoretical technologies (Dewey, 1929), where concepts are not seen as the building blocks to a theory, but as tools that help make particular studies possible. In the case of Sørensen’s study on the materiality of learning, she draws on a range of different theories that help sensitize her analysis to looking at practice in particular ways. For example, drawing on the idea of performativity from such scholars as Barad (2003), Sørensen focuses the analysis of her field notes on a series of questions that examine “what is achieved through an arrangement of interrelating parts (Sørensen, 2009, p. 28). In this case, Sørensen does not engage in deductive testing or extension of an existing

theory of performativity, rather she is using it as a way to identify examples of how, in the case of her research, materials participate in the educational practice. Subsequently, the goal of her analysis is to produce new theoretical technologies that assist further studies on the materiality of learning.

This methodological mode of pragmatist research is particularly useful for my research question in that my sites of investigation suggest novel ways of human organization and arrangement that are distinct from traditional firm- or state-based models of human organization, and in particular, traditional conceptions of newcomer socialization in organizational settings. Exploring such settings requires an analytical flexibility that current conceptualizations of newcomer socialization do not provide; therefore, exploring this question of newcomer behavior would benefit from taking on new forms of investigation.

As I outline in Chapter 2, forms of presence as a theoretical technology is useful in the analytical flexibility that it provides compared to existing theories of newcomer socialization that frame the newcomer experience as either institutionally constrained or individually determined. This is important to note because the newcomer experience on participatory platforms often complicates the traditional dichotomy of newcomer socialization in organizational contexts. Drawing on actor network theory described in Chapter 2 and scholarship on subjectivity, or how people come to be through social, discursive, and material processes, the theoretical technology of forms of presence helps approach agency not as something that entities possess, but as a field of forces at the site of research that construct agency (Sørensen, 2013).

From an empirical standpoint, the study of agency from a sociomaterial perspective focuses the attention of the researcher on the configurations of relationships between human and nonhuman actors, the characteristics of these relationships, the effects of agency based on these relationships, and how these relationships and effects change across different contexts of participation. Drawing on the three forms of presence, I explore how, for example, a newcomer's experience oscillates between moments exploring the platform on their own terms and then finding themselves subject to the authority of rigid constraints imposed by platform leaders and experts that have delegated their authority to platform features, or, how the effects of institutionalized socialization may be achieved in contexts that do not resemble a firm-based model of organization. By drawing on the flexibility of a sociomaterial approach to conduct research, forms of presence as theoretical technology help to advance how we make sense of newcomer socialization in online settings, observing how newcomers move between moments of rigid and fluid participation. Furthermore, a sociomaterial approach accounts for the role of nonhumans in the experience of newcomers, helping to demonstrate novel ways in which institutional forms are perpetuated over time in settings where opportunities for learning to participate are not always contingent on interactions between humans but instead rely on interaction between humans and objects (Mugar et al., 2015).

By drawing on the forms of presence in my analysis, I am not engaged in a deductive testing of Sørensen's forms of presence, rather I am using them as sensitizing objects to consider different possibilities for relational characteristics that perform particular effects of human agency in different contexts.

With the epistemological underpinnings of my research in place, the following sections of this chapter describe both of the research settings in detail, how and what types of data I collected, and how I approached the process of analyzing the data using Sørensen's forms of presence as a theoretical technology.

3.2 Research Setting

The sites of research are two participatory platforms that can be defined as open online knowledge production platforms, each contributing to the production of knowledge in different forms and doing so using contrasting approaches for involving volunteer labor. The models of participatory platforms and the scholarly understanding of this phenomenon have both evolved, and the idea of openness has been tempered by varying conditions that define how people participate (Barney et al., 2016; Kelty & Erickson, n.d.). Two prominent models of labor on participatory platforms are peer production and crowdsourcing, which are fundamentally different in the way we understand the governance of projects and in who ultimately sets the goals and manages the operation of the platform (Brabham, 2013).

In the case of peer production models, there is the theoretical possibility that anyone can move from a position of being a newcomer to eventually taking on a managerial role in the project, defining goals and building tools that help volunteers get there. On the other hand, crowdsourcing projects exhibit a distinct barrier of participation between the volunteers and the leaders of the project that define goals and procedure. For example, in a crowdsourcing project like Planet Hunters, a volunteer may become a power user, classifying tens of thousands of data points, contributing countless comments in the social spaces of the platforms, and finding new and innovative ways to do the primary task of the platform;

however they will never have the opportunity to redefine the goals of the project and change processes of participation. The power of defining the goals and modes of participation is reserved only for the founders and experts that have built the platform.

Drawing on the logic of extreme case study comparison (Yin, 2014), choosing two contrasting models in the broader phenomenon of online participatory platforms will help to generalize my findings across many contexts of open online knowledge production, demonstrating value to both a scholarly and practical understanding of how the periphery of participation is managed and how newcomers negotiate the periphery across a wide range of settings.

By investigating two separate cases using ethnographic methods, it is also important to point out that the boundaries of the two research sites are not tightly defined by a specific location as one might find in traditional ethnographic investigations of laboratories in science and technology studies or anthropology. In my research, I situate myself across multiple settings, from participating on the platforms using my web browser to sitting face to face in a room with the software developers and scientists that are building the platforms. This approach to ethnographic research has been described as multi-sited ethnography, where the researcher focuses not on a phenomenon as it exists in a discrete physically bounded location, but as it appears through connections and circulations across many sites (Burrell, 2009; Hine, 2007; Marcus, 1995).

[3.2.1 Wikipedia](#)

In 2000, Jimmy Wales launched NuPedia, a free online encyclopedia written by experts volunteering their time. The project vetted the quality of the contributions using a peer review

model, where experts volunteer their time to review and provide feedback on the work of other experts before a final product is published. Despite this new and innovative model for content creation, the project did not gain momentum. It was not until then editor and chief of NuPedia, Larry Sanger, adopted a new piece of software that the momentum, direction, and philosophy of the free encyclopedia endeavor would change dramatically.

In 2001, at the insistence of a friend, Sanger introduced a new software platform developed by Ward Cunningham in 1995 called Wiki. The Wiki software is a website technology that provides an editable web interface and keeps a history of all the changes made to the page. The software was introduced as Wikipedia, a platform for generating feeder articles for NuPedia (Jemielniak, 2014), allowing anyone, expert and amateur alike, to write new and edit existing articles by simply using the Wiki software. After only a few months of implementation, it became clear that the momentum in attention for content creation favored Wikipedia, and in 2003, the NuPedia project ended, having produced only 24 articles in three years while volunteers on Wikipedia had generated over 150,000 articles in two years.

Since 2001, volunteers have combined to produce over 30 million articles across 286 languages.¹ On its front page, Wikipedia is described as the encyclopedia that anyone can edit and some of the most recent data points to a volunteer base of over 71,000 active editors.² Among many tasks that editors take on, some include starting new articles, copyediting content, adding references to existing articles, adding images and videos, and combatting

¹ <http://en.wikipedia.org/w/index.php?title=Wikipedia:About&oldid=593407408>

² <http://en.wikipedia.org/w/index.php?title=Wikipedia:About&oldid=593407408>

vandalism. Despite concerns over the quality of an encyclopedia that anyone can edit, Wikipedia was found to rival the quality of Encyclopedia Britannica (Giles, 2005).

With its growth in volunteer and article size has also come a shift in its position as an authoritative source for knowledge on the web. As Heather Ford points out, searching for a topic on Google will not only turn up links to Wikipedia as some of the top results in the query, the knowledge graph feature on Google summarizes the Wikipedia article content on the right hand side of the Google search interface (Ford, 2015), suggesting that Google treats Wikipedia as a knowledge authority by highlighting its content outside of search queries. Furthermore, the growing authority of Wikipedia is seen in the growing recognition amongst academics and government officials that Wikipedia is an important space for the representation of their ideas, findings, and positions (Ford, 2015; Teplitskiy, Lu, & Duede, 2015).

This growing position as an authority for knowledge on the web makes it an important site of struggle for how knowledge is represented, making what was once hailed as a disruptor of traditional gatekeepers of knowledge (Weinberger, 2011) a gatekeeper in its own right (Ford, 2015). As an emergent gatekeeper of knowledge representation, Wikipedia exhibits a tension between the rhetoric and practice of openness and as such presents itself as a viable site of research to explore how conditions of newcomer participation are defined. In the remainder of this description, I identify a range of sociotechnical conditions that define how content is produced on Wikipedia and within these conditions, how the shifts in process and growth in power of Wikipedia has also led to struggles with retaining new participants, a key motivation for using Wikipedia as a case in this research.

Wikipedia falls under the broader definition of open source (Brabham, 2013) but is more specifically understood as what Yochai Benkler describes as commons-based peer production (Benkler, 2006; Benkler & Nissenbaum, 2006). Benkler (2006) defines commons-based peer production as a mode of collaboration over sociotechnical infrastructures amongst thousands of people, creating goods ranging from software to news media, and coordinating their work without the use of market pricing or managerial hierarchies. In commons-based peer production, the means for production are shared (e.g., the technical platform for collaboration) as is the content (e.g., software, encyclopedic articles). In many cases, people are motivated to contribute as volunteers based on prosocial signals, or a desire to contribute something to the common good rather than responding to market or managerial signals. While this characteristic of individual autonomy and operation outside the traditional coordinating signals of markets or firms may reflect the dominant reality of many Wikipedia editors, it is important to acknowledge that Wikipedia does contend with and navigate the realities of paid editing³ and does operate in larger institutional settings that dictate what work is to be done.⁴ Despite these exceptions, Wikipedia does exhibit unique characteristics in terms of how work is coordinated, with a heavy emphasis on shared social norms and awareness of rules and policies.

In principle, peer production models are defined as exhibiting egalitarian characteristics of coordination, with no single individual controlling the direction of the project, participants working on what they want, and volunteers contributing to the broader governance of the project (Benkler, 2006). With the exception of open source software projects that operate on

³ <http://en.wikipedia.org/w/index.php?title=Wikipedia:About&oldid=593407408&oldid=731889348>

⁴ https://en.wikipedia.org/w/index.php?title=Wikipedian_in_residence&oldid=735347167

more explicit and traditional hierarchical models (Crowston & Howison, 2005) peer production models like Wikipedia can be described as relying on a social framework of social norms, peer review, rules, and technical constraints (Benkler, 2002). Social frameworks reflect the community-driven governance of the project, and feature extensive rules and guidelines intended to frame the production of content and how volunteers interact with one another.

Central to understanding how content is produced on Wikipedia are the “holy trinity” of policies on Wikipedia: *Neutral point of view*, *Verifiability*, and *No original research* (Reagle, 2010). Neutral point of view reflects a need for content to be written in a balanced way reflecting all sides of a topic. While seemingly impossible, Reagle suggest that this policy strives to create an epistemic stance of inclusion, where viewpoints, right or wrong, are accounted for. Verifiability and No original research address the need for attribution of sources to statements. In short, if a statement about a topic is made and there is no published source to confirm the statement, it cannot be included on Wikipedia. Also worth mentioning here is *Notability*. Notability is a guideline that strives to draw the line between what content can and cannot be included on Wikipedia. Generally, this guideline is enforced around the availability of reliable sources on the topic, and, as I will describe in later chapters, is a contentious space between new editors and experienced editors, with the former often pushing the definition of what counts as notable against the latter’s interpretation of the guideline. Relating to how editors interact with one each other, personal conduct policies like *No personal attacks* work to promote a productive and collaborative atmosphere, mitigating what some have described as

the inevitable devolution of conversations on internet forums⁵. Another core conduct policy that highlights the peer production characteristics of work on Wikipedia is that of consensus decision making. Here, the consensus policy defines how editors work together to come to specific editorial decisions (Reagle, 2010), with a particular focus on ensuring that all viewpoints are included in the decision making process. Of particular relevance to this research is the behavioral guideline *Don't bite the newbies*. Here, the text from the guideline page describes how newcomers often make mistakes but do so in good faith, without intention of malice toward the goals of Wikipedia. As such, experienced Wikipedians should not get angry at new editors. Such a guideline is important in the content of internet forums in that new members often feel discouraged and leave due to negative feedback about their work or comments (Zhu et al., 2013).

Wikipedia is a self-governing community, relying on its volunteers to enact and enforce the many guidelines and policies, of which I have only defined a fraction. In order to enforce these guidelines and policies, a class of users and roles have emerged that hold unique editing privileges over the majority of volunteers on Wikipedia (Butler et al., 2008), displaying what has been described as a quasi-hierarchy (Jemielniak, 2014). One of the more visibly distinct roles on Wikipedia is that of the administrator, who, unlike a registered user, has the privilege to block and unblock accounts, as well as delete articles and restore content. The ability to block users and delete articles is an important part of enacting the governance of the platform. For example, many new users may create articles that are not deemed notable based on article

⁵ A reference to Godwin's Law, an assertion by Mike Godwin that as conversations grow longer on internet forums, the likelihood of someone being called a Nazi or Hitler increases.
https://en.wikipedia.org/w/index.php?title=Godwin%27s_law&oldid=740213632

creation guidelines, therefore requiring the actions of an administrator to delete them.

Administrators are also often called upon to block users from Wikipedia due to disruptive behavior. Such power is, of course, not something that any user should wield, and as such, receiving such privileges is done through an extensive process, Requests for Adminship, where experienced editors are nominated or self-nominated and must make a case for why they should have such privileges.

While all editors on Wikipedia are involved in upholding policies and guidelines by fighting vandalism and ensuring articles meet notability standards, the actions of humans in maintaining order are complemented in no small way by the work of semi- and fully automated bots programmed to change content as well as detect and alert users of actions that may go against article editing guidelines and policies. The prominent role of bots in the governance of Wikipedia has been described as algorithmic governance (Müller-Birn et al., 2013), emphasizing that the growth and scale of Wikipedia has depended on the presence of nonhuman actors automating some tasks and assisting human editors in others (Geiger & Ribes, 2010; Niederer & van Dijck, 2010). While the formalization of practice and efficiencies of bots supporting quality control can be perceived as a community coming of age (Morgan, Gilbert, McDonald, & Zachry, 2014), the tension between the rhetoric and practice of openness has been observed in the action of bots, impacting the most precious resource that any open online community requires: new volunteers.

Recent research has shown that such efficiency has been accompanied by a crippling of the growth in volunteer participants (Halfaker, Geiger, Morgan, & Riedl, 2013a). In particular, the tools that support efficient reversion of bad edits have consequently targeted newcomers

who, given their new status in the community, are not fully aware of the norms for contribution. As Halfaker et al. (2013) point out, the increase in rejecting newcomer edits has led to a decrease in the survival of newcomers in Wikipedia. With the success of open collaboration projects highly correlated with the retention of new participants (Ducheneaut, 2005; Schweik & English, 2007), the significant decline in newcomer retention is not only a cause for concern for the sustainability of the project, it also brings into focus the tension between the rhetoric and practice of openness on Wikipedia, highlighting the role of gatekeeper played by both bots and experienced Wikipedians (Jemielniak, 2014).

3.2.2 Planet Hunters

Planet Hunters is an online platform that engages volunteers in the analysis of data from the Kepler space telescope in the broader scientific endeavor of finding new planets. In this work, volunteers analyze the light output of stars measured by the Kepler space telescope, looking for dips in the light reading that may represent a planet passing between the telescope and the star. By looking at the light readings and marking light curves that may show evidence of a planet, volunteers engage in data reduction (Wiggins & Crowston, 2010), where they sift through millions of data points, identifying those few pieces of data that may merit further investigation by expert scientists.

Started in 2010, volunteers on Planet Hunters have made over 20 million classifications, identified 34 potential planets, and made one confirmed discovery of a new planet. By supporting scientists in data reduction work, volunteers are engaged in authentic scientific practice by contributing to a necessary part in the production of scientific knowledge (Jason Reed, 2012). Such engagement of volunteers in the production of scientific knowledge is a form

citizen science, or public participation in scientific work (Bonney & Shirk, 2007; Wiggins & Crowston, 2015). Examples of citizen science come in many shapes and sizes, with varying conditions of participation defined for volunteers. In some case, volunteers work alongside scientists to define and carry out a community-based scientific agenda (Wandersman, 2003) while other projects situate volunteers within a narrow set of tasks defined by researchers. Planet Hunters aligns more with the latter definition, using a top-down model where scientists situate volunteers within discrete boundaries of contribution to process of producing scientific knowledge.

Planet Hunters is part of a broader suite of citizen science projects on the website Zooniverse.org that are focused on data reduction across a wide range of scientific disciplines. Zooniverse was founded by Oxford physicist and BBC television show host Christopher Lintott, who in 2007 started Galaxy Zoo, a project designed to help scientists classify characteristics of galaxies shown in images taken by the Sloan digital sky survey telescope. At its inception, Galaxy Zoo set a record for classifying over 750,000 images (Wiggins & Crowston, 2010), leading to more projects and scientists adopting the data reduction model used at Galaxy Zoo. Like Galaxy Zoo and other projects at the Zooniverse, Planet Hunters works on a consensus model, where multiple volunteers look at the same image, with promising images receiving high consensus being passed along to scientists for further analysis. This model of human perception for identification of scientifically relevant data in images has been shown to be highly precise (Delaney, Sperling, Adams, & Leung, 2007) and is still more successful than computational approaches to image recognition in such contexts. Like many projects in the Zooniverse, Planet

Hunters relies on advertisements in popular science magazines and mentions on television shows to drive interest in participation.

The Zooniverse is an organization made up of staff from Oxford University and the Adler Planetarium in Chicago. Supported by various scientific funding agencies, the staff at the Zooniverse are tasked with working alongside scientists who have access to data to develop the digital platforms that will engage volunteers in the task of data reduction. The team of scientists behind Planet Hunters is a team of astrophysicists from Oxford, Harvard, and Yale. This team of researchers and software developers define the nature of the task that volunteers will engage in and the online interface where the work is done. In Planet Hunters, the scientists and software developers have created an interface that asks volunteers to look for the presence of transiting planets by annotating light curve images taken of stars by the Kepler space telescope. Data is presented to participants through a classification interface that asks a series of questions related to the characteristics of the light curve. Beyond making classifications through the primary interface (see Figure 3.1), volunteers can also leave comments up to 140 characters in length about their work on the talk interface. In the talk interface, comments range from questions about the work to statements about what a volunteer observed in the classification interface. In addition to the talk interface, the discussion feature, which does not have any character limitations, affords experienced volunteers the opportunity to talk at length about different data objects. Here one can observe more experienced volunteers engaging in extensive analysis of data using their own set of tools (Hassman, Mugar, Østerlund, & Jackson, 2013).

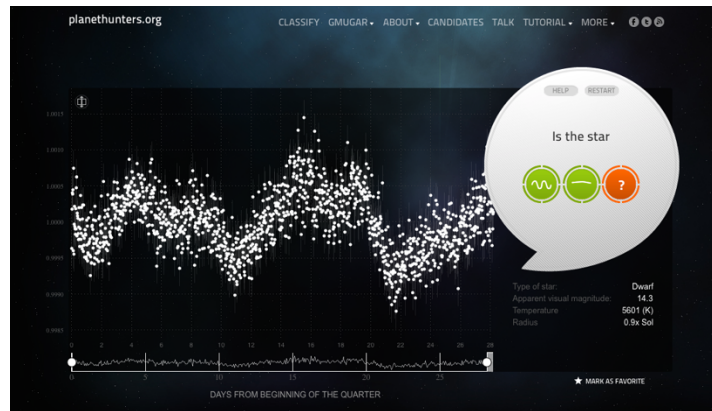


Figure 3.1 Planet Hunters Classification Interface

Unlike Wikipedia, Planet Hunters is built from the top down by scientists to support their research goals (Wiggins & Crowston, 2011). Resources for learning how to participate are also defined by the scientists running the project. Such resources include blog posts from the science team, help features that remind participants how to identify transits, and videos from science team members about how to participate (Østerlund et al., 2014). Science team members are engaged in the project to answer questions participants may have as well as to ensure that conversations in the forum reflect factually accurate information. Science team members also designate active volunteers as approved moderators to help with answering questions and promote civil conversation in the social spaces of the project.

Beyond the rare instances of being asked to be a moderator, there are no formal roles for participation other than being a volunteer, although research has shown that volunteers may develop unique participation patterns that resemble tasks specializations, for example uniquely participating in the talk spaces of the project (Jackson, Østerlund, Maidel, Crowston, & Mugar, 2016). To this point, while participation is predominantly limited to the goals of the project enacted through the features of the classification interface designed by the science

team, it is not uncommon for divergent themes of participation to emerge where volunteers contribute to the project using means other than the classification interface to analyze data for characteristics other than transiting planets. Unlike Wikipedia, while such emergent pathways of participation may result in unique volunteer-led subprojects within the platform, these subprojects do not alter the broader trajectory and goals of the project defined by the science team. For example, while some prominent members have been invited to the annual ZooConference, where developers and scientists meet up to discuss their projects, there is no evidence of volunteers becoming part of the science team and defining the broader aims of the projects. Such influence is reserved only for those who possess doctorates in relevant scientific fields, are staff at partner institutions, or are Zooniverse staff.

In the case of Planet Hunters, participation as a newcomer at the periphery of a project involves receiving explicit instructions on what to do and how to do it. This well-articulated space of participation stands in contrast to the descriptions of what the newcomer experience is like in peer production settings like Wikipedia, where the newcomer starts out observing ongoing activity as a way to figure out how they will contribute to the project (Bryant et al., 2005). It is the contrasting condition of peripheral participation that makes a project like Planet Hunters a particular compelling case to study when considering what participation looks like at the periphery of online participatory platforms.

3.3 Data Collection

Ethnographic research is a process of immersion in the culture of the research site, building relationships with and learning about the daily practices of people you seek to know more about using a combination of observation, interviews, and analysis of artifacts and archival

material. While ethnographic research has its roots in anthropology where researchers are physically co-located with their research subjects, the past decade has seen an increase in the amount of scholarship where researchers conduct ethnographic investigations of online environments and virtual worlds (Boellstorff, Nardi, Pearce, & Taylor, 2012), engaging in what is described as virtual ethnography (Hine, 2000) and trace ethnography (Geiger & Ribes, 2011). While there were a few instances in which I was physically co-located with my research subjects, the majority of my research relied on using techniques of virtual ethnography, observing available textual traces of participation and interviewing site participants (Hine, 2000). In particular, observations relied on a technique known as trace ethnography, a form of observation tailored to online environments where observation of participants is performed by recreating an experience through histories of a user's participation as they exist in server logs. While a trace ethnography approach is a powerful technique for revealing the experience of participants on an online platform, my experience has shown me that it is only as good as the data points of user activity captured by the platform. Where one platform may have a wide range of data points that explain different facets of the user experience, another platform may have only a few. Therefore, as I will explain later in this section, in cases where trace data was not as rich, in terms of what it reveals about user activity, using different data collection techniques became particularly important for painting a robust picture of the newcomer experience.

My strategy for determining who to interview and observe in each case was driven by theoretical sampling (Corbin & Strauss, 2008). In grounded theory, theoretical sampling describes a process where the ongoing analysis of data motivates subsequent decisions on data

collection. Using this approach, analysis begins as soon as data collection begins, rather than waiting for data collection to end, with emerging concepts from the data analysis defining subsequent moves for sampling. In using theoretical sampling, a researcher samples for concepts, rather than people, looking for examples in the data to show how concepts vary in different settings (Corbin & Strauss, 2008). While I will provide a more detailed description of the analytical process later in this chapter, theoretical sampling was accomplished by applying open coding and memoing to the transcripts of my interviews and field notes. Emergent concepts helped to inform what I looked for in subsequent field observations as well the direction and emphasis of the semistructured interview protocol I developed.

	Planet Hunters	Wikipedia
Total number of interviews	17	19
Interviews with Newcomers	13	15
Interviews with Experts	4	4
User Accounts Observed	26	27
Number of Field Note Pages	50	54

Table 3.1 Summary of Data Collection

At the heart of ethnographic research is the question of gaining access to a research site. In ethnographic research, the purpose is not to show up as a researcher, ask questions, then leave. Rather, a researcher must take part in and observe the “daily activities, rituals, interactions, and events of a group of people as a means of learning the explicit and tacit aspects of their life routines and their culture” (DeWalt & DeWalt, 2002). In the context of open online knowledge production communities, initial access as an ethnographer is, in most cases,

not as complicated as gaining access to observing the daily lives of street gangs (Whyte, 1995) or observing and participating in a police academy (Van Maanen, 1973), rather all one must do is visit the online platform and start contributing. However, as with any form of ethnographic field work, building relationships with gatekeepers is invaluable and takes time and commitment to the field site in question. In the case of my two research sites, it was my long-term relationship with senior members of both research sites as well as a formal relationship as a grant-funded researcher that helped me gain access to key informants and server data.

My access to key informants and data on Wikipedia came in the form of long-term relationships I have had with the community since 2009, when I interned with the New York City chapter of the Wikimedia Foundation. In this position, I developed curriculum and outreach initiatives designed to encourage video contributions to Wikipedia articles. As an intern, I developed friendships and working relationships with experienced and visible members of the Wikipedia community as well as senior members of the Wikimedia Foundation. As I describe in detail in the findings chapters, in 2010, I served as a campus ambassador to the Wikimedia Foundation at Syracuse University, developing curriculum to support article editing in college classrooms. During the time that I collected data for this dissertation, I worked concurrently as a design researcher on a Wikimedia Foundation-funded research grant to create a new mentor matching system for new editors. I was tasked with conducting exploratory research to map the current field of newcomer support resources, interviewing newcomers about how they used different features to make sense of their new settings. This was a fortuitous alignment with the goals of my dissertation, and I therefore used the opportunity to collect data for both this study and my work as a grantee of the Wikimedia Foundation.

Despite having a strong network of relationships with foundation staff and well-known editors in the community, and working on a Foundation-funded grant focused on improving the experience of newcomers, alignment with gatekeepers did not result in the type of access to potential interview subjects as it might in ethnographic work in traditional anthropological or sociological research field sites (DeWalt & DeWalt, 2002). The community of editors on Wikipedia is a large and shifting landscape and knowing important people does not necessarily mean they know the people you want to talk to. Indeed, my focus on newcomers exacerbated the problem that the traditional role of a gatekeeper alleviates.

While observing participant activity on Wikipedia is only a matter of looking at their publicly available edit history, attempting to talk with them is more challenging. In my early attempts at gathering interviews, I prepared a recruitment letter that positioned me as a researcher from my home institution working on a grant funded by the Wikimedia Foundation (see appendix item B). This yielded few responses from potential subjects. Through conversations with fellow ethnographic researchers about my challenges trying to recruit interview subjects, I realized that my recruitment letter positioned me as an outsider to the community of editors. Furthermore, while I cannot know for certain the reasons why people did not respond to my interview requests, the idea of reciprocity in ethnographic research may hint at other possible reasons for the initial lack of response. Reciprocity suggests that for an ethnographic researcher to gain access and become a participant in a field site, they must indicate what they are giving back to the community (DeWalt & DeWalt, 2002). Indeed, in my initial letter, by positioning myself as an outsider, I was not giving any sense of how my research might benefit the respondent and the broader Wikipedia movement. My second letter took

reciprocity and positionality into consideration and shifted the emphasis from my position as an institutionally affiliated researcher to emphasizing instead my being a longtime contributor who is also conducting research (see appendix item B). As soon as I shifted the emphasis of my positionality as a researcher and the value of my work to the community, I began to find more people to interview.

In the case of Planet Hunters, my access to the community was defined as a National Science Foundation grant-funded researcher working in collaboration with the Zooniverse.org at the Adler Planetarium in Chicago, Illinois, and at Oxford University in the United Kingdom. In this capacity, it was easy to reach out to staff working on the development of the platforms or the science teams behind the different projects. Gaining access to server logs was also easy as this data was already defined as an integral component to the collaboration. Like Wikipedia, the landscape of contributors to Planet Hunters is also constantly in flux, so having established relationships with the staff at Zooniverse and the science team of Planet Hunters did not create easy access to contributors. With the exception of the science team setting up interviews with moderators on Planet Hunters and an in-person interview with an active Planet Hunters participant at a Zooniverse conference, finding newcomers as well as more experienced members to interview required a process of refining technical and social parameters for interview requests. While I will speak to this process in more detail later in this section, searching for newcomers also involved the way in which I positioned myself as a researcher. As with my initial interview subject recruitment on Wikipedia, the tone of my letter positioned me as a researcher collaborating with the Zooniverse. In this case I was given an email address “research@zooniverse.org” that helped lend credibility to my claim to be a researcher, valued

and approved by the project. While this initial approach worked with finding newcomers to interview, the approach did not have the same effect with expert members. In the case of finding experts to interview, I shifted my approach in a similar way to the changes I made in my recruitment strategy for Wikipedia. Rather than emphasize my position as a collaborator with the Zooniverse.org staff in my email, I emphasized my position as a participant in Planet Hunters who was also doing research. I felt comfortable doing this as I was actively making classifications and leaving comments. I also decided to drop the use of the official zooniverse.org email address and send messages through the Planet Hunters platform, using the personal messaging function on the user profile page. Like the changes I made to my approach with subject recruitment on Wikipedia, these changes to my recruitment approach on Planet Hunters resulted in getting more responses from Planet Hunters participants.

3.3.1 Participant Observation

Participant observation in ethnographic research requires researchers to take part in the activities and observe "the ways in which people interpret the world and organize their lives" (Hine, 2000, p.42). In much of what is described as ethnographic work, the researcher is physically co-located in their research setting, building relationships with people in their research site, observing the actions, and participating in the routines of their daily lives. In participant observation, data is generated through the creation of field notes, where the researcher writes about their experience and understanding of the context they are situated in (Emerson, Fretz, & Shaw, 1995). Over the course of my research, I generated 104 pages of observational field notes across my two sites of research.

My participation in the two research sites was akin to what any social scientist would do in ethnographic work. While I have a long-term relationship that precedes and extends beyond the purpose of this research, my time on Wikipedia for this project took place over 20 months, from May 2014 to February 2016. In my capacity as a Wikipedian, during this time I contributed to the creation of a newcomer support platform and worked as a Wiki-Gnome, making small copyedits and content updates, and adding videos and pictures to articles. In Planet Hunters, I participated for 26 months from September of 2012 to November of 2014, using the classification interface to annotate data from the Kepler space telescope. I also participated by leaving comments on talk pages when I had questions or when I thought I saw something of importance.

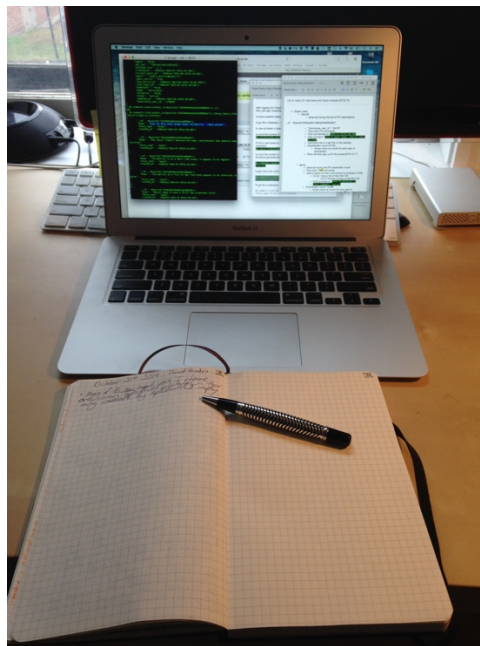


Figure 3.2 Observing and taking field notes of participant activity on Planet Hunters

Unlike physically co-located ethnographies, observation of activities at these research sites relied on techniques of virtual ethnography (Hine, 2000) and trace ethnography (Geiger &

Ribes, 2011), where observation involves reconstructing the experience of participants using available time-stamped traces of their activity as they appeared on the talk pages and server logs of Planet Hungers, and the edit histories of Wikipedia. While the trace ethnography approach has been successfully used in a number of contexts (Ford & Geiger, 2012; Mugar et al., 2014; Ribes, Jackson, Geiger, Burton, & Finholt, 2010), the approach necessarily varies based on the affordances of a platform, the complexity of the task, and the degree of attention that the platform's software developers have dedicated to capturing the spectrum of user activities. Indeed, there was a marked difference in the degree of transparency of user activity across Planet Hunters and Wikipedia. This affected the prominence of the role played by observation for each site as my field notes varied between the cases.

For Wikipedia, all edits made by a user when logged into their account are recorded and publicly available. Within this data point, a researcher can see what articles a volunteer worked on, what the content of their edit was, and if they used any special tools to make their edit. All of this is publicly accessible and can also be viewed through tools available on Wikipedia that run queries on user edit histories and summarize their activity across different dimensions, making it easier for the researcher to get a summary of a user's edit history activity. Furthermore, a publicly available SQL portal for running queries on Wikipedia activity is available along with extensive documentation about the different SQL tables and fields, which helps researchers understand what data they have access to. This publicly available data is a product of the design philosophy driving the Wiki software developed by Ward Cunningham, where the transparency of activities is a key component to supporting the distributed collaboration of editors (Reagle, 2010). The relative transparency of activity allowed me to

observe the history of 27 user accounts, documenting in my field notes what articles they worked on, how they were contributing to articles and other pages on Wikipedia, what conversations they were having, what tools they were using, what spaces they were participating in, and how their participation was changing over time. Recording this activity in my field notes involved a combination of manually writing notes, copying and pasting links and text from edit histories or conversations, and taking screen shots that I imported into the qualitative analysis software NVivo.

By contrast, distributed collaboration is not what drives the core mission of the Planet Hunters platform design. Publicly available traces of user activity are limited to comments they leave on talk and discussion pages. Access to activity logs of user participation beyond their comments requires a researcher to conduct queries of the server's database, where a researcher can access an individual's data annotation history, the comments they have generated, and the pages they have viewed. In my field notes, I recorded the history of their use of the social features of Planet Hunters and their classification activity. As well, I examined the chronology of their use of these features and, in the case of the social features, coded the comments they made so as to better understand how they participate in the project. Using data collected by running a combination of basic queries, I examined summaries of the classification and social activity of 26 users visible in database dumps that came from Zooniverse as well as reviewing publicly available traces on the Planet Hunters platform. My approach to taking field notes on Planet Hunters was identical to my approach for Wikipedia, using a combination of handwritten notes, screen shots, and cutting and pasting of textual traces (see Figure 3.4). One notable exception for the Planet Hunters case compared to Wikipedia was the opportunity for

co-located observation at two conferences in Chicago where the Zooniverse staff from Oxford and Chicago, the science team from various projects, and a select number of volunteers all met up to talk about the state of the Zooniverse. At these conferences, I had the opportunity to sit in on meetings with the science teams, platform developers, and staff. In this setting, observation took the form of taking handwritten notes. My presence as a researcher at the conference was disclosed from the very beginning, and my access to this space was based on my being a member of a team of researchers that was working in collaboration with Zooniverse staff.

Finally, observing participants in an online setting based on unique parameters of participation, in this case new users, requires various strategies to sort through millions of user accounts. While a trace ethnography approach could allow me to observe the early experience of any user on the project, no matter their tenure (experienced members, historically, when they were new users), I also wanted to interview current new users, therefore, finding users who had recently joined the project was important as I wanted to ensure that they could, with some degree of accuracy, reflect on their experience as a newcomer when I interviewed them. Therefore, finding accounts to observe was bounded by temporal conditions. On Planet Hunters, I focused on finding newcomers that had been with the project for no more than a month but had made at least 10 contributions. By ensuring newcomers had made at least 10 contributions, I was able to avoid collecting those accounts that had been created but were inactive. For more experienced users, I looked for participants that had made 1000 classifications, a number that emerged in pilot interviews as being representative of a volunteer that was comfortable with and knowledgeable about the classification process. On Wikipedia, I

used a similar approach, looking first for newcomers that had been with the project for a month but had made at least 50 contributions. As part of my role as a researcher on the Wikimedia Foundation grant, I worked with data scientists at the Wikimedia Foundation to develop queries that found newcomers who met these conditions, and who had used specific newcomer resource spaces.

During my early round of observation on Planet Hunters and Wikipedia, I started off by finding accounts (participants) to observe that fit the parameters of participation that fit my research question. However, after a poor response rate for interview requests for the handful of accounts I initially observed, my strategy shifted to contacting accounts that had turned up in my queries for *interviews* and then, prior to the interview, observing only those accounts that agreed to be interviewed.

3.3.2 Interviews

Interviews are a valuable data collection tool that help address aspects of participant behavior that observation alone cannot capture. For example, I used interviews to explore questions of motivation and the thought process behind the actions I observed on the platform. Such questions demonstrate the value of interviews for unpacking and describing aspects of social processes that observation alone cannot capture (Rubin & Rubin, 2005).

With the exception of the two Planet Hunters conferences that I attended in Chicago, interviews were conducted using a variety of internet-based communication technologies that best suited the needs of the respondent. In my recruitment email I gave people the option of doing a video call using Skype or Google Hangout, a call with just audio, or a text-based interview on the platform of their choosing. Different approaches revealed different constraints

and affordances for the process of interviewing. In the case of video calls, I was able to make, albeit limited, observations of the respondent's setting. For example, in one interview, I noticed that the respondent had a glass of wine with them. When I mentioned this, they pointed out that this was part of their regular ritual of sitting down at night and engaging in work related to Planet Hunters. Such insights revealed aspects of practice that were not possible to make with audio alone. Some respondents preferred a more asynchronous approach, using the chat functionality of Skype or the sandbox on Wikipedia. In these settings, asynchronous modes of interviewing afforded me more time to think about each respondent's answers, examine specificities of their user history visible to me in trace data, and formulate follow-up questions.

Across the cases, I collected a total of 36 interviews, 17 in Planet Hunters and 19 in Wikipedia. In Wikipedia, 15 interviews were conducted with newcomers and four were conducted with experts, while on Planet Hunters, 13 were conducted with newcomers and four with experts. Synchronous interviews lasted between 50 minutes to an hour and a half while asynchronous interviews generated four to five pages of single-spaced text.

The semistructured interview protocol was designed to cover both experienced and new participants of the respective projects, with certain questions from the protocol being omitted, depending on the tenure of the user. The goal of the interview protocol was to generate a conversation around the participation habits of the respondent, how these habits had changed over time, what resources they draw on to do their work, what resources they draw on to make sense of the project, and how the use of resources changed over time (see protocol appendix item X). The style of questions reflects what Rubin and Rubin (2005) describe as sequence probe questions, where the researcher asks for step-by-step descriptions of activities. These

types of questions helped to elicit a picture of the different tools and people that were integral to the respondent's participation. Such questions speak to the practice perspective that drives this research, highlighting the convergence of social and material entities that define practice at both a micro and macro scale.

In my approach to interviewing, I drew on an emerging movement in qualitative research that combines trace data with traditional qualitative methods like interviewing and participant observation. For example, scholars have combined traces of activities as they appear on hand written documents with interviews of relevant subjects to illustrate specific practices (Østerlund, 2008), while others have brought together trace data related to the historical evolution of documents with interviews and participant observation as a way to target specific aspects of behavior that emerge from the trace data (Sawyer, Kaziunas, & Østerlund, 2012; Østerlund, Snyder, Sawyer, Sharma, & Willis, 2015). Another approach that is more closely aligned with my design is that of trace interviewing (Dubois & Ford, 2015) where researchers develop visualizations of a user's activity history and present it to their interview subjects during the interview process, allowing the subjects to interrogate and expand on the data in the visualizations. In the various forms of combining trace data with traditional qualitative methods, researchers experiment with different moments when the trace data and traditional qualitative approaches intersect. In my approach, I began first by using the trace data to write up a timeline summary of the user history that emphasizes what work they were doing, the tools they used, and the people they interacted with. With this reconstruction, I then conducted an initial interview with the trace data, applying my interview protocol to trace data reconstruction of the newcomer experience to answer questions as best as I could, which then

generated follow-on questions related to the protocol which I used during the interview, probing for clarity around context and detail regarding the newcomer's practice. By prompting the interview subject with examples from their past, including specific details about their participation, such as what tools they used and in what context they used them, the combination of trace data and interviews helped to address key validity issues related to interviewing methods like memory recall and self-bias reporting. Furthermore, it helped to triangulate my data, combining different data sources relating to the same phenomenon (Dubois & Ford, 2015).

After transcribing and analyzing the transcripts of my interviews, I developed a list of follow-up questions that I sent through email, generating an ongoing conversation with the respondent that allowed me to not only dig deeper into their answers, but also engage in a member-checking strategy, where I solicited feedback on emergent themes in my ongoing analysis.

3.3.3 Document Analysis

Part of the trace ethnography and virtual ethnography approach is to not only observe participants in online settings, but also account for the documents and artifacts that exist in these settings. In distributed work settings like Wikipedia, documents play an integral part in the coordination of activity, therefore accounting for them is an important part of understanding how meaning is produced and perpetuated (Geiger & Ribes, 2011). The same can be said about the role of documents on Planet Hunters, where FAQ documents about participation play an important part in the newcomer experience and must therefore be carefully considered when analyzing participant activity. As part of my data collection, I

accounted for the role of various documents as I became aware of them through interviews and observation. Prominent examples of documents in my analysis include the workflow charts that helped new article reviewers on Wikipedia make decisions about whether or not to accept the work of newcomers, or the help button on Planet Hunters, where the content written by the science team played an integral part of how newcomers dealt with moments of not knowing how to do the work of annotating data. Regardless of the top-down or bottom-up configuration of the two cases I examined, both involved a distributed body of contributors that actively relied on documents to make sense of their work, therefore documents played a necessary and critical role in how I understood the experience of newcomers across both cases.

3.4. Analysis

Analyzing data began as soon as I had my first interview transcript and field note from observations. As previously mentioned, grounded theory relies on the strategy of analysis throughout data collection so as to support theoretical sampling and eventual theoretical saturation. As I described earlier in the chapter, theoretical sampling is a technique where a researcher samples for emergent concepts. For example, during my data collection, I noticed an emergent theme in my interviews and observations that pointed to the role of semi-automated tools in newcomer participation on Wikipedia, therefore I made a point of seeking out more newcomers that had experience with such tools to extend the depth of my data on the role of semi-automated tools. The role of analysis throughout the data collection process is also integral to reaching theoretical saturation, otherwise described as knowing when data collection is no longer needed. Theoretical saturation is reached when a researcher is no longer

uncovering new concepts and the connection between concepts begin to stabilize in their ongoing analysis.

Analysis was done using the qualitative analysis software, NVivo. The NVivo software is designed to support grounded theory, allowing for easy rearrangement and grouping of emergent codes, writing and connecting memos to data and codes, as well as importing screen shots and various other artifacts that I captured from the research sites. NVivo was also useful in querying for key words that appeared in my field notes, transcripts, and memos, making the process of searching for quotes or events efficient. Furthermore, as my coding scheme evolved over time, NVivo was useful for revisiting data that had been collected toward the beginning of my project and recoding it using my updated coding structure, ensuring that all data was being viewed through the most current analytical lens.

Analysis in grounded theory draws on the technique of open coding, where a researcher looks through the raw data of transcripts and field notes and identifies concepts that stand for chunks of raw data (Corbin & Strauss, 2008). Within the concepts, a researcher looks for the properties of the concepts, or the characteristics that define how a concept stands for a range of examples in the raw data, as well as the dimensions of these properties, or how these properties vary (Corbin & Strauss, 2008). Identifying concepts in raw data is achieved by focusing on context and process, where context reflects the micro conditions or experiences that someone faces on a daily basis and the macro conditions, or the social, political, and historical conditions that inform the day-to-day experience. Process is then how someone negotiates and responds to these micro and macro conditions. In my research, paying attention to context and process was essential to understanding the intersection of the conditions that

platform leaders and experts create, how these conditions play a part in the experience of newcomers, and how newcomers negotiate these conditions.

In addition to looking at context and process in my data, my analysis also focused on aspects of the newcomer experience made salient by the theoretical technology of Sørensen's forms of presence (Sørensen, 2009, 2013). As I described earlier in this chapter, forms of presence orient a researcher's attention toward the sociomaterial configurations of practice and the effects of practice as performed by the agency of a participant as it relates to learning and contributing. Furthermore, forms of presence offer an analytical flexibility for considering how the configurations of a newcomer's practice change from moment to moment, allowing the researcher to accommodate the fluidity of a newcomer's experience as they move from moments where their participation is narrowly constrained to other moments where they are controlling the trajectory of the work.

Throughout the process of open coding, I engaged in constant comparison and memoing, two core techniques to grounded theory. Constant comparison describes the act of comparing incidents in the data with other incidents as a way to classify data. As I moved along with open coding, incidents that were conceptually similar to other incidents were grouped together to refine existing codes, extend the dimensional depth of the concept, or they were grouped together to achieve a higher level descriptive concept (Corbin & Strauss, 2008). As Corbin and Strauss point out, the act of constant comparison throughout the analytical process is what helps a researcher to build differentiations between concepts, understand the properties and dimensions that are unique to specific concepts, and to build up groupings of concepts that produce higher level categories. Constant comparison was also useful in that it

motivated and reminded me to revisit raw data that had already been coded with updated concepts that emerged in latter stages of analysis and data collection.

The act of constant comparison was often done in the context of writing memos. Memoing serves as an opportunity for a researcher to begin theorizing about the relationships between different concepts and categories as well as exploring the varying properties and dimensions of concepts as they appear across various examples in the raw data. In memos, a researcher engages in informal writing, freely exploring the broader significance of their ideas without having to commit to the final product of the memo. Memos are also a logistical strategy for keeping track of how you are making sense of the growing volume of transcripts and field notes. Writing memos throughout the data collection process helped to summarize my current thinking around emergent concepts and categories that represented the data I had at the time. In the memos I would write about specific transcripts and field notes as examples of the concepts and categories. In the latter stages of analysis, this helped to identify useful examples in my data to revisit for further analysis. Furthermore, memos were the first step toward broader theorizing about the findings and were important throughout the analytical process as they determined needs for theoretical sampling as well as identified the eventual moment of theoretical saturation.

3.4.1 Data Validity

Built into the analytical process are strategies that address the validity of data. Data validity is most commonly associated with a positivist epistemology, where quantitative methods are used to capture data about seemingly stable relationships between variables that are out there to be observed. Validity in such a case reflects an attempt to understand the extent to which

the data is trustworthy or credible (Lincoln & Guba, 1985), accurately representing what really exists. This is, of course, complicated slightly by the ontology and epistemology associated with qualitative research, where reality is viewed from the perspective of being pluralistic and perpetually reconstructed, not only from moment to moment, but also in the way that we situate ourselves as researchers in our attempts to represent phenomena in our data.

Nonetheless, qualitative research should not be immune to strategies and tactics that demonstrate how the statements made by a researcher in their findings reflect the phenomena they observed. Built into my research design are three techniques that helped support the validity of my data: constant comparison, triangulation, and member checking.

I used the technique of constant comparison to help me critique the emergent concepts that I attached to data. It challenged me to explore the concepts with more depth and also to see if and how they were different from other emergent concepts. Constant comparison was also a motivation for theoretical sampling where I would gather more data so as to explore the depth of concepts and their diversity, as well as their relationship to other emergent concepts.

Triangulation describes the technique of gathering data on a particular phenomenon using different data collection tools, helping to build coherence and justification for particular concepts. In my research, triangulation was accomplished by not only observing a newcomer's activity, but also interviewing them, helping to generate concepts that emerged across the two types of data (Creswell, 2009). Another valuable data point was analyzing the artifacts that played a role in the newcomer experience, paying attention to their history, stability, and position within the projects and how this was reflected in what I observed and heard from the newcomers that I encountered in my research. Finally, integral to the validity of my data was

member checking, where I would take emergent concepts and categories and follow up with people I had previously interviewed as well as known experts within the research sites (Creswell, 2009). This was usually accomplished by follow-up emails or video calls with newcomers and experts, where I would present some of the themes that were emerging in my research and probe for feedback about their accuracy in representing their experience with the project. In doing this I supported the validity of my findings, ensuring that my own bias and position as a researcher was not the sole driving force of the analysis and that members of the research sites also had a voice in how I would represent their experience and their community in my work.

3.5 Conclusion

This research used the techniques of virtual ethnography (Hine, 2000) and trace ethnography (Geiger & Ribes, 2011) for the collection of data across both digital and in-person settings. Interviews were conducted with newcomers and experts of the respective sites in both digital and face-to-face settings, while trace ethnography techniques were deployed to reconstruct the experience of participants using traces of their activity available through database queries and publicly available traces of activity on the platforms. Data analysis used inductive techniques of grounded theory, using constant comparison and memoing to explore emergent concepts in the data. While inductive techniques were used, analysis was sensitized using the theoretical technology (Dewey, 1929) of Sørensen's forms of presence (Sørensen, 2009, 2013), directing my attention toward the sociomaterial configurations of newcomer participation and the effects of the configurations as performed by the participation of newcomers. The analysis of the data began immediately after the first field notes and transcripts were produced,

supporting the process of theoretical sampling, where the direction of data collection is motivated by concepts that emerge from the analysis. Ongoing analysis was performed through the writing of memos where emergent concepts and relationships between concepts were explored, building broader theoretical categories that spoke to the questions driving the research and also determining when the data collection was reaching theoretical saturation. Quality of the data was supported through data triangulation, member checking, and constant comparison of concepts in the data.

Chapter 4: Points of Entry

4.1 Introduction

In 2005, Bryant, Forte, and Bruckman published their now seminal article that describes the trajectory of participation for newcomers to Wikipedia. In their work, the authors trace a trajectory of participant movement from a point where the individual made small contributions to the point where they were more invested in the maintenance of the community and became more aware of the tools, rules, and norms that shape the practice of the community. In this description, the agency of the newcomer is the focal point as they pick and choose what sources they will learn from and how they will participate on the platform. Indeed this description, grounded in Lave and Wenger's theory of legitimate peripheral participation (Lave & Wenger, 1991), still holds as a way of describing the changes in participation as newcomers progress from new contributors to sustained and knowledgeable contributors. It is the description of this seemingly informal and individual endeavor, where the newcomer is described as gradually figuring out the landscape of participation, that is more true of Wikipedia when it was four years old than it is now, 10 years after the article was published.

Since Bryant et al. published their article, the landscape of Wikipedia has changed dramatically, from one that was described as having low costs to participation (Lerner & Tirole, 2002) to one where newcomers are increasingly put off by the harsh environment of negative feedback and leave the project (Halfaker et al., 2011; Halfaker, Geiger, Morgan, & Riedl, 2013a). Furthermore, the broader governance of Wikipedia has been described as a bureaucracy,

indicating that much of the practice has evolved into a “complex structure of rules, processes, policies, and roles” (Butler, 2008, p. 1101).

In this chapter, I show how, across both Wikipedia and Planet Hunters, the periphery of participation is not simply a matter of showing up, observing, and making small contributions. Unlike the hands-off image of project governance that the notion of low barriers to entry suggests, both Wikipedia and Planet Hunters have a variety of features that inform and in some cases, guide the paths of participation for newcomers. What this chapter illustrates is that the notion of low barriers to participation has been met with a response that constructs formal and ad-hoc points of entry that actively vie to shape how a newcomer understands what it means to participate in a project. What I describe in this chapter is that both Wikipedia and Planet Hunters exhibit similar strategies that reflect how the concentration of power for governance also extends to features and structures at the periphery of project activity. All of the examples point to a variety of explicit tactics that experts and leaders deploy to lay claim to the periphery of participation, shaping opportunities for newcomers to learn and participate. In this chapter, I describe two dimensions in the theme of points of entry: formal and ad hoc.

4.2 Formal Points of Entry

To illustrate the formal dimension, I describe how the crowdsourcing platform Planet Hunters and the peer production platform Wikipedia exhibit similar strategies for shaping the experience of newcomers. While there are a myriad of newcomer support resources on Wikipedia compared to the handful of resources on Planet Hunters, each case demonstrates efforts by project leaders and experienced members to define and control the experience of newcomers as they attempt to participate and understand project standards. My analysis of the

formal points of entry across the two cases revealed two dimensions that reflect unique and explicit tactics for shaping the newcomer experience: *boundaries of participation and knowledge* and *routing newcomers toward authority*. As I will describe in this section, these strategies perform what Sørensen would describe as authority-subject presence, where participation is defined by newcomers having their attention directed toward information and instructions that are managed and defined by a group of leaders or expert members. The difference between the two dimensions however suggests different strengths of the authority in controlling how newcomers participate, where the dimension of *boundaries of participation* describes an experience where newcomers have no choice but to engage a specific set of activities and features, while *routing newcomers* describes an experience where newcomers are made subject to an authority but are not obligated to follow.

4.2.1 Boundaries of Participation and Knowledge

From the moment the URL for the online platform loads, the newcomer is either already situated or becomes situated within a narrowly defined region of practice. Instructions are given on what tasks the newcomer will engage in and how they will do the tasks. Mandatory training or tutorials give the newcomer an overview of how to contribute and reference materials that are close at hand should the newcomer have any uncertainty while they are participating. Instructions on what to contribute and training materials on how to contribute are developed and maintained by a group of project leaders that work for an organization, hired for their expertise on the subject matter of the project and their ability to convey the information needed to teach volunteers. In this setting, learning how to participate is a matter

of imitation, where newcomers move back and forth between contributing and referencing the materials created and managed by experts as a way to frame their contributions.

The above description speaks to the experience of newcomers using the Planet Hunter's tutorial and classification interface and newcomers who participate in Wikipedia in the classroom curriculums. In these examples, the convergence of clearly articulated instructions and learning materials performs authority-subject presence, with distinct regions of participation where experts define how and what work is done and newcomers are subject to the authority of the materials and instructions. These distinct regions of participation are defined by the predictability of activity that is supported not only by the reference materials and training programs that all newcomers who participate in these settings encounter, but by the instructions for participation that all newcomers receive.

In my description of Wikipedia in the classroom curricula and the tutorial and classification interface on Planet Hunters, I unpack how authority-subject presence is performed in the formal points of entry that define the boundaries of participation and knowledge. In the first example, I look at the emergence of a new organization dedicated to integrating Wikipedia editing into college classrooms and the experience of newcomers in the classroom settings. In the second example I describe the tutorial and reference materials on Planet Hunters and the role that this material plays in shaping the newcomer experience. In both examples, I describe how distinct regions of participation occupied by newcomers and experts, respectively, are performed and how newcomers do not have access to influence the region of experts. I also examine how newcomers are given very little leeway in how they

choose to learn and participate, emphasizing opportunities for participation that reflects Sorensen's description of authority-subject forms of presence.

Wikipedia in the Classroom

In the summer of 2010, the Wikimedia Foundation received a grant from a private family foundation to create a pilot program that engages students from public policy departments at American universities to edit Wikipedia articles about US public policy topics. Syracuse University, home to the Maxwell School of Public Policy, was one of the schools chosen to participate. In the summer of 2010, I transitioned from finishing my master's degree at New York University and an internship at the New York City chapter of the Wikimedia Foundation to starting my doctoral studies at the Syracuse University School of Information Studies. Given my experience with Wikimedia NYC, I was asked by the Wikimedia Foundation if I would help launch this new program at the Maxwell School of Public Policy. A few weeks after accepting the offer to launch the program, I was flown down to Washington, DC, for a two-day meeting on the George Washington University campus where I met with members of the Wikimedia Foundation, education experts, and other students and professors selected to launch the program at their respective institutions.

The meeting on the George Washington University campus consisted of reviewing a proposed curriculum designed by the education experts and foundation staff for introducing Wikipedia to new editors in a classroom setting as well as strategizing around how to merge the editing of Wikipedia articles with existing research assignments. Those of us who would launch the program were asked to modify the proposed curriculum, present new lesson plans, and give mock lectures about key themes relevant to new editors. Our work and presentations were

assessed by members of the foundation, expert Wikipedians, and the education experts. At the end of the two days, we all returned to our home institutions with a large binder containing a curriculum and sample lesson plans to help develop the final curriculum.

Back at the Syracuse campus, I used the content from the binder I had been given in Washington, DC, to develop a series of slide decks that would be used to introduce students who were new to Wikipedia to such topics as article quality standards, the five pillars of Wikipedia, and the role of the talk page and community interaction on article development. In the classroom, I presented the slides to the students and conducted live demonstrations of editing an article on Wikipedia. In addition to lecturing, I walked students through creating their new accounts and setting up their sandbox where they could practice making edits. As students prepared to edit articles, they added their name to a project page on Wikipedia that indicated their presence in Wikipedia as students in the public policy initiative. This project page also served as a hub to connect the students with experienced Wikipedians who had agreed in advance to volunteer their time as mentors, supporting the students as they made their first foray into making contributions to Wikipedia. Such mentorship not only proved helpful in teaching the students about how to edit, but also served as a political alliance for the students, validating their presence on Wikipedia in the face of editors who were not excited about the influx of new editors brought on by the public policy initiative.

At the end of the semester I was flown to the Wikimedia Foundation headquarters in San Francisco to meet with many of the people whom I had met with in Washington, DC, to debrief them on the first semester's experience and develop new material for the following semester. By the end of this meeting, standardized slide decks on teaching Wikipedia in the

classroom were developed and distributed to the growing ranks of professors who were interested in using Wikipedia in their classroom. Furthermore, I was also tasked with building a lesson plan to train experienced Wikipedians on how to teach Wikipedia to new editors in the context of a college classroom. By the end of the first year, the public policy initiative had engaged 816 students across 32 schools, introducing them to Wikipedia and guiding them through their initial contributions.⁶

Fast forward a few years, and the model for engaging college students in Wikipedia editing has extended far beyond students in public policy programs. The program has evolved into its own organization that has spun off from the Wikimedia Foundation to become the Wiki Education Foundation, specializing in connecting college classrooms to opportunities to edit articles by maintaining a curriculum and training infrastructure for such activities. As of the spring semester in 2016, there were 2,308 students across the globe participating in courses supported by curriculum and materials designed and maintained by the Wiki Education Foundation.⁷

Jane, a professor of nursing practice, decided to integrate Wikipedia editing into her classroom after attending a workshop at her college given by a member of the Wiki Education Foundation. At the workshop, the presenter passed out pamphlets that introduced people to what it means to edit articles on Wikipedia. Before bringing the activity of editing Wikipedia to her classroom, Jane decided to try out editing first. Jane described to me how the content of the pamphlet suggested that she begin by looking at similar articles to understand their

⁶https://outreach.wikimedia.org/w/index.php?title=Education/Dashboard/Wikipedia_Education_Program_Summary_Information&oldid=111977

⁷ <https://dashboard.wikiedu.org/explore>

structure and formatting. With a sense of how the article should look, she began to structure her article in her sandbox and then left a message on the article talk page indicating that she was planning to make changes to the article. Both the move of structuring her edits in the sandbox and leaving a message on the article talk page about her intentions to edit were suggested to her by content from the pamphlet she received at the workshop. From the pamphlet, she also learned that she could get feedback by adding the “Did you know” template, a process on Wikipedia that reviews early-stage articles and, if they qualify, pushes them to the front page of Wikipedia so that they gain more visibility.

In preparing to integrate Wikipedia editing into her course, Jane described to me how the Wiki Education Foundation provided a template for a course page on Wikipedia. Once she filled in the information, she was linked to course pages from past classes where she could see how other courses had been structured and how they integrated article editing into the class. Additionally, the course page provided a training curriculum both for her students and for her as the instructor. Jane described the training as videos that covered such topics as the pillars of Wikipedia and the basics of editing



Figure 4.1 Example of editing guide used in Education Program

Similar to the training provided for instructors like Jane, Kevin, a student in Jane’s class also had a newcomer experience where resources were made readily available to him so that he could make sense of how to make his first contributions to Wikipedia. In reviewing Kevin’s edit history, I find that his first edits to Wikipedia were part of a training module hosted by the Wiki Education Foundation (see Figure 4.2) which provides an overview of the core principles of contributing to Wikipedia and a technical tutorial on editing and some advanced topics, such as how to add images or use the “Did you know” review process described earlier. Before he started working on his first article, Kevin worked with his classmates, pulling references together and discussing how they would make improvements to their target article. As he started developing the article, Kevin would give and receive feedback on the article’s development with his classmates (giving feedback to other students’ work in the class was a

requirement outline by the instructor). In addition to using the student training module when he first started editing, Kevin actively referred to the course page on Wikipedia for his class which, in addition to listing the curriculum for the semester, also featured content such as cheat sheets on wiki syntax, tutorials, and pamphlets introducing the basics of Wikipedia. Here he would find answers to whatever questions he had about editing articles.

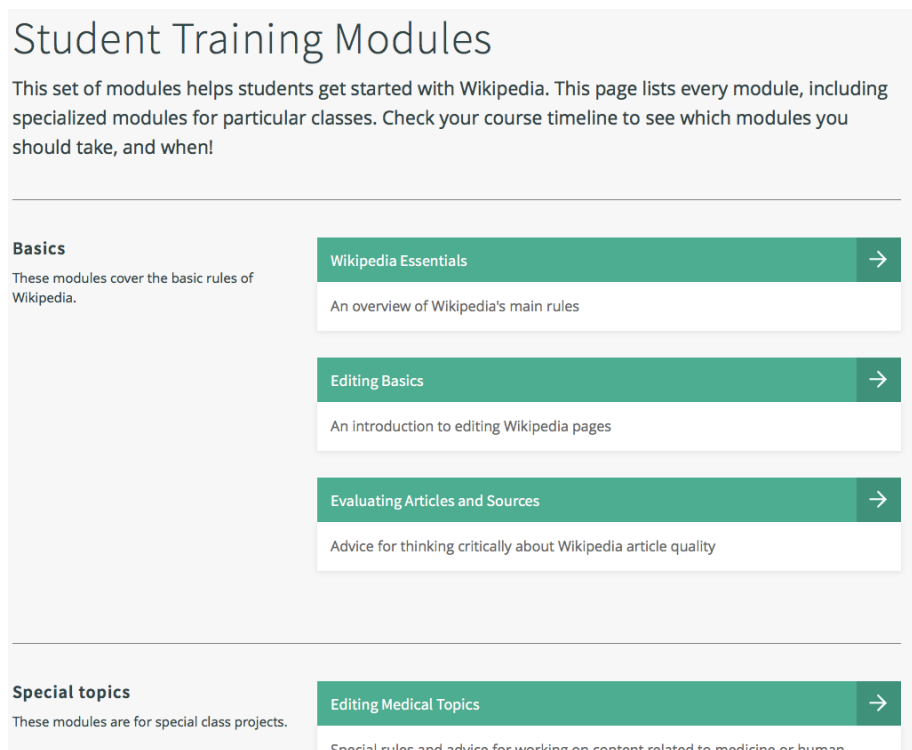


Figure 4.2 Wiki Education Foundation student training portal

Tutorial and Site Guide on Planet Hunters

Many newcomers to Planet Hunters learn about the project through their favorite science show or science-themed publication. Excited about the prospect of contributing to science, they will go to the Planet Hunters website which immediately presents them with an opportunity to start classifying planets. As an unregistered user however, clicking the “Start classifying” button

brings them to the classification interface with a tutorial layered over it (see Figure 4.3). In the tutorial, new users are guided through a sequence of pop-up screens that provide information about the data they will be annotating, how to use the different features of the classification interface, how the science behind planet hunting is observed in the interface, and finally, how to annotate the data by marking up a simulated light curve that has transit-like features. After completing this tutorial, a newcomer is set loose to annotate data.

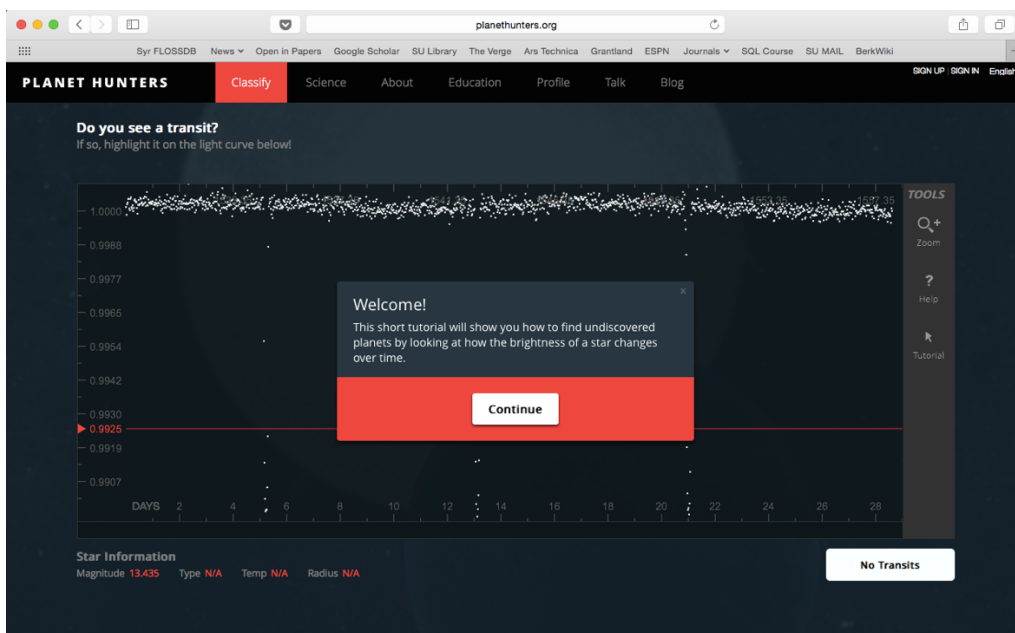


Figure 4.3 Screen shot of the tutorial layered on the classification interface

Interviews with newcomers revealed that the tutorial offered a good baseline understanding of how to approach the work of annotating light curves. Newcomer Janice noted, “I think it’s very clear...they indicate to you the process they have.” Similarly, Jim said “I just kind of followed the tutorials, I just went on them and kind of just went from there.” However, a more common opinion that I encountered in my interviews was that the tutorial

conveyed ideal settings, where the example of the transit reflected a large planet that was easily identifiable to the naked eye. As one user points out:

The tutorial is like looking for the nose on a clown's face, the data in tutorial reflects looking for massive Jupiter's that stand out, but what we are searching for are planets the size of earth which I am sure would be blurred in the glare of the stars...The tutorial gave an outline of what we are looking for but basically what we are looking for infinitesimally smaller.

(Interview with Lawrence, November 7th 2014)

Despite the concern about the lack of nuance in the pedagogical approach of the tutorial, the tutorial is perhaps better defined as a technical tutorial, describing how to use the interface for annotating light curves. Furthermore, while the tutorial may have shortcomings, as the subsequent accounts will show, the tutorial is not an isolated entity in the broader ecosystem of newcomer support tools, nor is it a feature that is used only once.

Pauline is an active participant with over 2,000 classifications under her belt. When I asked about her experience using the tutorial as a newcomer, she pointed out that she would go back and forth between the tutorial, doing a few classifications and then going back to the tutorial to look at examples.

Pauline: So I went back to the tutorial a lot to figure that out and that was basically it.

Question: Okay, so when you say you when back to it, would you do a couple of classifications and then refer back to it?

P: Yeah there was one that I could not figure out, I would go to the tutorial and look at the examples

(Interview with Pauline, September 13th 2013)

While not exhibiting the active back and forth that Pauline describes, Roger describes how he would use the tutorial as a refresher.

I might go back and look at some of the tutorials just to refresh my memories. I'm one of those guys that wants to do it right. If I can't remember something about the light curves I will go back and hunt through the tutorials to refresh my memory.

(Interview with Roger, September 18th 2013)

Complementing the tutorial is the help button, which allows a newcomer to examine a series of light curve examples curated by the science team (see Figure 4.4). Accessed through the classification interface, the help button played an important role in my experience as a newcomer to Planet Hunters. In my field notes I write about how, after not having contributed to Planet Hunters for a few days, the help button helped reorient me toward the work at hand. In particular, I describe how I move back and forth between looking at the data in front of me and reflecting on the examples, comparing features from the example to the data I need to classify.

In my interview with Patricia, I observe how she describes her work as a newcomer as actively drawing on the help button and tutorial whenever she is unsure of how to do her work. She describes a back and forth activity, moving between working on classification and referring to the help feature.

Well when you start looking over the images you can always have a click back on the help button, so you can have a few images where you know what you're doing and then you'll have one that will bring up something different and then you can always go back and really go through some of the quick tutorials then you can understand what you're looking at.

(Interview with Patricia, May 11th 2014)

Between the tutorial which newcomers are required to take, and the well-defined boundaries of project knowledge easily accessible by newcomers, the design of the platform creates a captive audience, making sure that all the knowledge they require to do the work is close at hand.

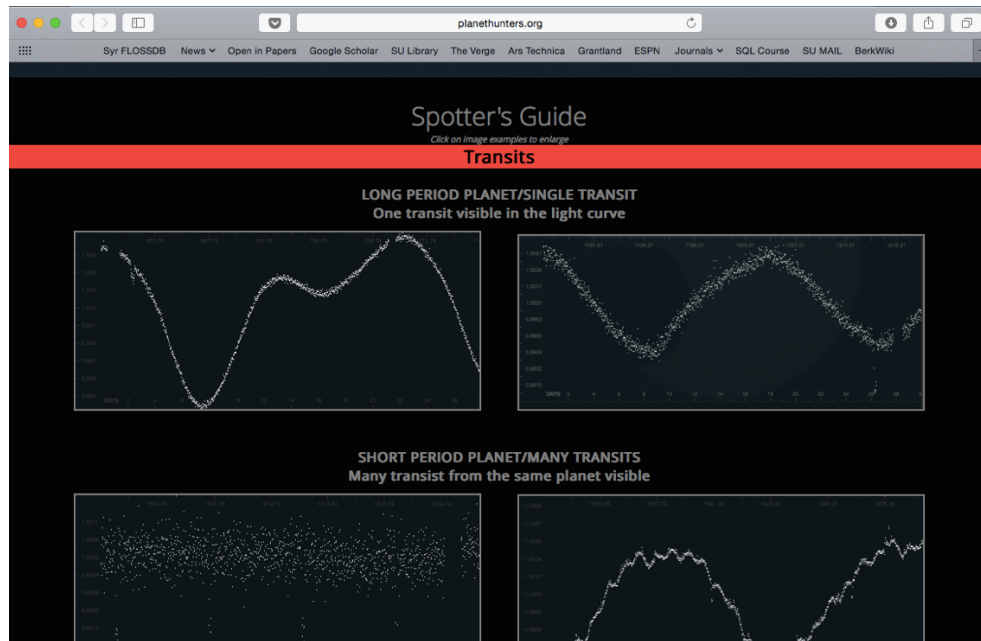


Figure 4.4 Help feature in classification interface

Like the help button, other valuable reference points authored by the science team are the “Science” and “Blog” buttons located across the top menu bar of the website. Unlike help, the science and blog pages cannot be accessed during the annotation of images. The science page features content that describes the mission of the project, describes the science of identifying transits, and an FAQ page, while the blog page features reports from the science team about the progress of the project as well as information to help volunteers learn how to contribute. Interviews revealed that the science page and blog are used as a reference for examples of different features in light curve images which allows newcomers to draw comparisons during the annotation task. These reference materials appear to be beneficial since participants may not always know what to look for; having exemplary images gives new participants the chances to learn what features are important during annotation.

In reviewing my field notes, I found that my experience was similar to that of other newcomers to Planet Hunters. For example, in one instance of scrolling through a blog post by a

science team member, I found a section titled "sorting the light curves" that focused on "flagging transit events." In this description, I found visual examples of what transit events looked like. This was my first experience viewing a clear description of a transit event. With a better sense of what a transit event looked like I felt more confident about how to move forward with annotating objects. The blog post also featured more examples of transit that provided me with a situated analysis of transits in a light curve. This also gave me a better sense of the other aspects of the data in the light curve that I needed to pay attention to.

Similar to my experience with the science blog, Roger, an experienced member, talks about how he came across a blog post that helped him better understand what characteristics in a light curve represent a transiting planet.

So in the beginning I started marking a whole mess of transits that I thought were there, and I thought, this is really hard. That takes a long time for a light curve; and then when I ran across this blog, I said, oh well, I hope I don't look at those because they are probably just apparitions in the optics. So I stopped doing that and I only mark a transit when there is at least three little white circles in the same time frame or very, very close to the same time frame. Like this one light curve I am looking at now, it's a quiet star and you can see that there are some dips below the main bunch of light dots that make up the light curve; but I would not call any of these a transit because there is only one in this day 24 or so, this one in day 25, this one in day 30, 33 there is one. I wouldn't call any transits, because there is only one little dot below the main light curve. So earlier, I would have marked them a[s] transits but I don't anymore...Because of that discussion on the blog."

(Interview with Roger, September 18th 2013)

Experiences like my own and Roger's are representative of the many conversations I had with other volunteers on Planet Hunters describing the important role that content written by scientists played in helping them make sense of the project. Such situated examples, while not discovered in the wild, were useful to new contributors in that they were more representative

of what volunteers might encounter than the examples provided in the tutorial or help features.

Authority-subject Presence and the Bounding of Participation and Knowledge in the Two Cases

The following key features of authority-subject presence are evidenced in the examples of newcomer engagement in Wikipedia in the classroom and with the Planet Hunters tutorial: predictability of actions, focusing of newcomer attention, defined regions of participation, and homogeneity of knowledge.

Both examples describe two unique and separate regions of participation. In one region, we observe that the staff at the Wiki Education Foundation and the scientists behind the Planet Hunters project have developed material that newcomers encounter in tutorials or reference material when they participate. The region of experts is inaccessible to newcomers in both projects. In Planet Hunters, the region of experts is occupied by scientists with doctorates in astrophysics, working as researchers in the astrophysics departments of prestigious universities. In the Wikipedia example, the region of experts is occupied by staff who have years of experience as Wikipedia editors and have subject matter expertise that is reflective of the different college courses that partner with the foundation.

The authority of the expert's regions over the regions of newcomer participation is imposed by the way the attention of newcomers is drawn to the knowledge resources and instructions developed by the participants in the expert region. On Planet Hunters, all newcomers focus their attention on the same tutorial, help guide, and set of instructions delivered by the classification interface. As I describe in the findings, newcomers often move back and forth between doing work and referencing the help guide or tutorial whenever they

are uncertain of their work. Similarly, all newcomers in the Wiki education project take the same training program and refer to the same reference material. Like the description of newcomers to Planet Hunters, descriptions of newcomers in the Wiki education programs illustrate a similar back and forth movement between doing work and referencing the guides created by the Wiki Education Foundation staff. By concentrating the attention of all participants on the same instructions, training, and reference materials, a one to many relationship is formed, where experts are able to command and control what all newcomers do and what resources they draw on when they are learning to contribute. This one to many relationship helps to create a stable, homogeneous, and predictable environment, where the actions of newcomers are aligned with the goals and standards defined by experts.

As a dimension of the points of entry theme, boundaries of participation and knowledge describe how a mature peer production project like Wikipedia and a crowdsourcing project like Planet Hunters have developed strategies that define how a newcomer learns and participates from the moment they begin participating. Newcomers in these examples are immediately presented with resources and directives that shape how they come to understand what it means to contribute to the project. In these examples, little room is given to a newcomer to figure out the project on their own terms or define how they will approach making contributions.

[4.2.2 Routing Newcomers Toward Authority](#)

Newcomer activity described in bounding of practice and knowledge illustrates an experience where the periphery of participation is locked down, with every aspect of participation from the beginning being defined. Routing newcomers toward authority, on the other hand, describes

how newcomers start out contributing on their own terms but are then subsequently routed toward newcomer support spaces. For some newcomers to Wikipedia, their actions within the first 48 hours of participation may trigger an invitation delivered by a fully automated bot, a software script or algorithm designed to detect specific characteristics of newcomer behavior and route them to tutorials or question and answer spaces. In other instances, a newcomer to Wikipedia that is creating a new article will immediately encounter prominent links that encourage them to submit their work to a queue to have their new article reviewed by other editors before it is published in the main space of the project. In either instance, this dimension of formal points of entry describes strategies used by expert project members and leaders to gather and direct the attention of newcomers toward liminal spaces where newcomers are made subject to the authority of expert members and receive directives or project knowledge and feedback based on protocols of interaction, workflows, and curriculums. In these spaces, authority-subject presence is performed, where experts work to place newcomers in settings where they can draw on and imitate approved knowledge about how to participate, encouraging a predictable and homogeneous region of participation.

In the following examples, I investigate three different strategies deployed on Wikipedia to gather and direct newcomer attention. In each example I describe how newcomers are situated in an environment of participation where only sanctioned and approved information and feedback is available to them, and in some cases, their participation in the project is separate from the main project, ensuring that they receive requisite information before they make live edits to articles on Wikipedia.

Hostbot

Within 48 hours of joining Wikipedia, any newcomer who has made at least five edits that have not been identified as vandalism by other Wikipedians has a high likelihood of getting an invitation from Hostbot to participate in one of two prominent newcomer support spaces on Wikipedia: the Wikipedia Adventure and the Teahouse.

Hostbot is a fully automated bot designed by Wikimedia staff and Wikipedian Jonathan Morgan. The purpose is to automate the process of inviting promising newcomers to support spaces so that they can get the answers they need and address any obstacle they may encounter. While the value of Hostbot was not addressed directly in my interviews, its importance in supporting newcomers was made clear when newcomers discussed the value of having found support spaces like the Wikipedia Adventure and the Teahouse after receiving invitations on their talk pages delivered by Hostbot. I will speak to both of the spaces in turn.

The Wikipedia Adventure

The Wikipedia Adventure was created in 2012 by user Ocaasi, now an employee of the Wikimedia Foundation and owner of a tutoring company. The Wikipedia Adventure (TWA) is a tutorial that guides newcomers through understanding the different ways they can contribute to Wikipedia, the policies and guidelines of participation, such as verifiability and neutral point of view, how and why to use features like the talk page, how to interact with other editors in a civil manner, and basic syntax like adding references and section headings. While the tutorial is completed using the Wikipedia interface, users are guided through an editing experience that focuses them on specific tasks, editing an article that is automatically created just for that user. Layered on top of the Wikipedia editing interface are pop-up windows that guide the user by

giving them instructions, directing them to interact with different features of the interface, or applying different concepts related to standards of editing and social interaction (see Figure 4.5). By engaging the tutorial, newcomers are not contributing to an actual Wikipedia article, but are instead removed from live article editing, focused on accomplishing the tasks of editing a training article based on instructions given to them by the tutorial.

My interviews revealed a sense of relief from newcomers that such a tutorial on Wikipedia exists. While most expressed that they could have probably figured out how to contribute without TWA, going through the tutorial expedited their comprehension of how to successfully contribute. As one newcomer pointed out, Wikipedia is not lacking instructions on how to contribute; it is just the task of finding and sorting through them that can be daunting.

Any time I've seen any sort of instructions on how to do Wikipedia there's so much information out there that there's too much, there's too much how to do it, and the Wikipedia Adventure is the newest you can get I've found to having a simple, plain instruction as to how to start out.

(Interview with Brianne, February 17th 2015)

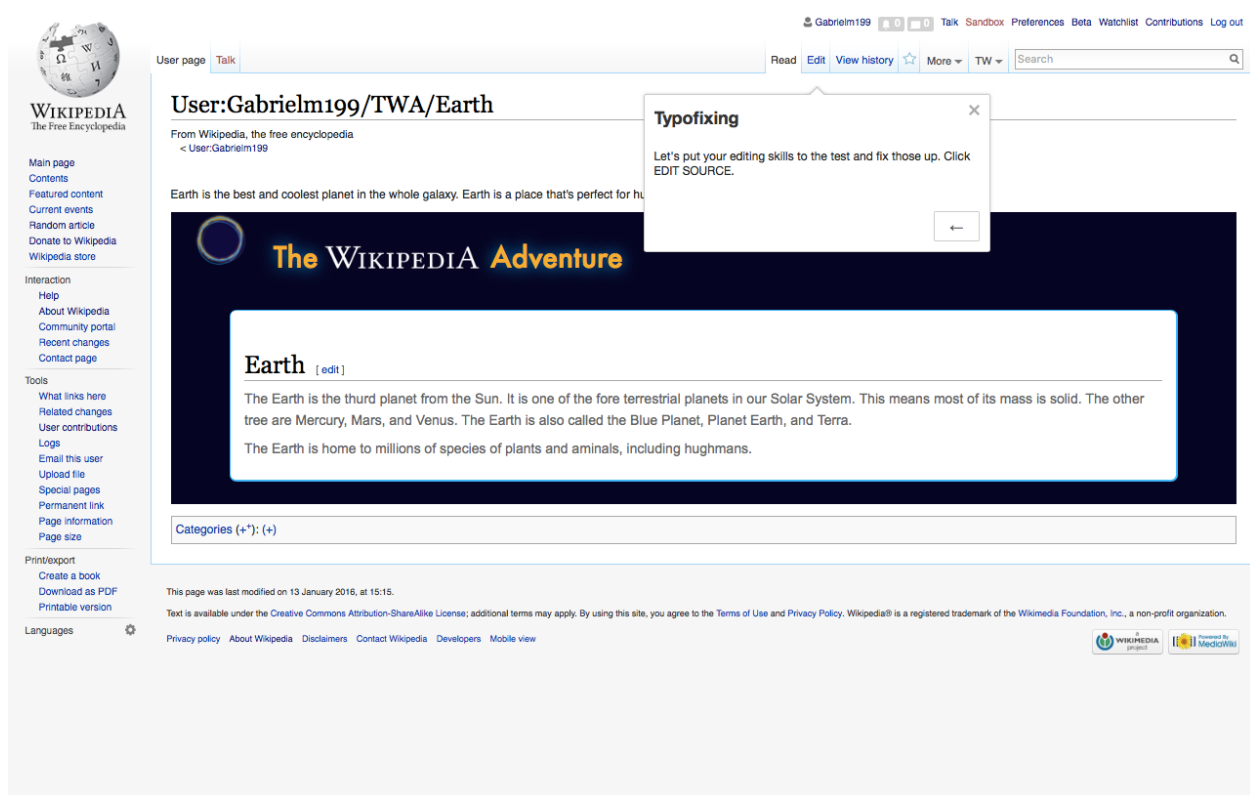


Figure 4.5 The Wikipedia Adventure with pop-up windows showing user how to edit content

Rachel was brought on as a volunteer at a museum library to update specific Wikipedia articles by drawing on the books from the library. Because she was new to Wikipedia, her supervisor directed her to the Wikipedia Adventure. Upon being directed to TWA, she focused all of her attention on it and completed it in a day without engaging in any other editing activity on Wikipedia. Prior to TWA, Rachel described to me how the whole editing interface and syntax on Wikipedia looked very complicated and intimidating, however after using TWA, she felt confident and no longer found all of the syntax in the editor to be overwhelming.

The coding seemed to be very complicated and I was trying to be really careful to not make a mistake, I was worried I mess up the entire article, but after going through the Wikipedia adventure I have a better grasp of what I am supposed to do

(Interview with Rachel, September 30th 2014)

Reflecting on what her experience would have been like had she not gone through TWA, Rachel suggests that having to take on the task of editing articles would have been difficult, but not impossible.

Without the Adventure initially it would have been a nightmare, I think eventually I would have been able to go through some sample pages and try to figure out what some of the format is...I would I would have had more trouble figuring out references, I wouldn't have known the standards regarding citation...it wouldn't have been impossible but it would have been more difficult.

(Interview with Rachel, September 30th 2014)

The Teahouse

Created in 2012, the Teahouse was designed as a space where newcomers can introduce themselves and “have their questions answered by patient, friendly Wikipedians, called hosts” (Morgan et al., 2013, p. 840). The idea of creating a friendly environment for asking questions is built around the broader recognition that asking questions as a newcomer in an online environment can be intimidating (Preece et al., 2004), therefore explicitly creating an environment that addresses this perception is important. Newcomers often find out about the Teahouse when they receive an invitation to participate from Hostbot on their talk page (see Figure 4.6). The effectiveness of the Teahouse for supporting newcomers has been demonstrated through research by Morgan et al. (2013) that shows newcomers who used the Teahouse contribute more to articles and discussion spaces and stay on as active editors longer than newcomers who did not go through the Teahouse.

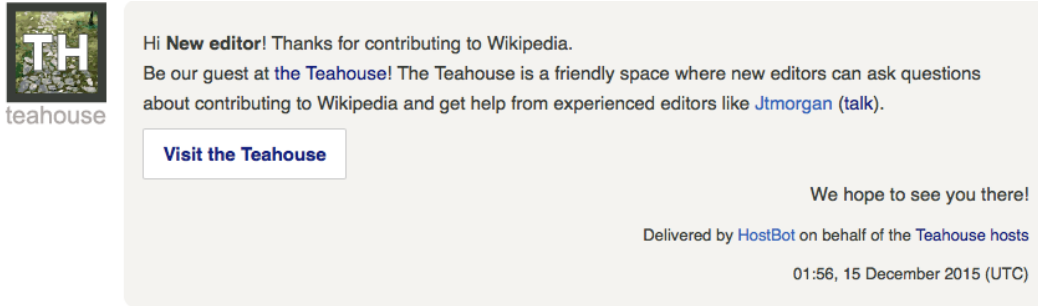


Figure 4.6 Invitation to the Teahouse delivered by HostBot

After observing activity at the Teahouse, I found that the hosts answering questions are Wikipedians with some degree of experience. For example, user Trevj had over 17,000 edits and user Cullen328 had over 39,000 edits. Despite the high edit count for these hosts, becoming a host is not bounded by any minimum requirements. To become a host, one must simply sign a pledge to uphold the methods of the Teahouse, which include, for example, being polite and patient and keeping explanations simple. Alternatively, one can simply answer a question that has been posted without creating a host profile. Through my observation of the Teahouse and an email exchange with its creator, I learned that there is no official approval process for hosts. Despite there being no initial barriers to participation, I observed moments where new users attempted to either be hosts or answer questions and were then subsequently called out by experienced Wikipedians for not having enough experience. As Jonathan Morgan, creator of the Teahouse describes, hosts will often revert answers provided by new editors.

Individual hosts may (and often do) revert new editors who create host profiles. Hopefully, this action is followed up with a polite explanatory note on the user's talkpage, encouraging them to learn the ropes of editing, and then come back and mentor others at the Teahouse. There was a thread about this recently on the Host Lounge: https://en.wikipedia.org/wiki/Wikipedia_talk:Teahouse/Host_lounge#Inappropriate_hosts

(Email exchange with Jonathan Morgan, January 18th 2016)

In following the link that Jonathan provided in our email exchange, I observe a conversation among active hosts at the Teahouse that addresses the presence of new editors that create host profiles. One user starts off the thread by asking if there is a way to address new editors creating host profiles, to which other editors reply that unless they have done something wrong, one should “AGF” or assume good faith, and just watch their actions and correct them on a case-by-case basis. Despite a few responses to this, another user chimes in, suggesting that the Teahouse adopt some minimum requirements for host profile creation and provides a draft of these minimum requirements. While the conversation does not indicate that new users creating host accounts is an epidemic, the thread does suggest that hosts’ participation in the Teahouse not only includes actively monitoring the advice that others are giving, but also involves attempting to define the characteristics of a competent host at the Teahouse.

Observing the archive of the questions asked at the Teahouse offers insight into the role that this space plays for newcomers. Questions range from newcomers seeking clarity about the notability policy after having their article deleted to technical questions about how to add a picture to an article. For example, one user asks a question about how they can find sources for an article that would be considered credible for an article about a television show. To this question, one of the hosts replies by first pointing the newcomer to the guidelines on reliable

sources and encourages them to join WikiProject Television to get a better sense of how established editors in this topic are defining credible sources. Another host jumps in and suggests that they look for trade journals like the *Hollywood Reporter* and avoid magazines like *US Weekly*. Such replies from hosts suggest the ways in which the Teahouse plays a part in aligning newcomers with resources for writing articles that are approved by experienced Wikipedians, therefore recreating and perpetuating the networks of alliances that define standards of article quality.

Articles for Creation and Article Creation Wizard

In May of 2005, an anonymous editor created a short biographic article on prominent political journalist John Seigenthaler that claimed he had been a suspect in the assassination of John and Robert Kennedy (Snow, 2005). Upon noticing the false information in September of 2005, Seigenthaler contacted Wikipedia founder Jimmy Wales to have the biography removed. While the call to Jimmy Wales solved the problem, Seigenthaler did not stop there. Seigenthaler wrote about his experience with Wikipedia in *USA Today* (Seigenthaler, 2005) and appeared on other media outlets denouncing Wikipedia as an unreliable source of information. The high profile exposure that called into question Wikipedia's values around anonymous editing has gone down in Wikipedia history as the "Seigenthaler incident," which encapsulated a shift in policy around anonymous editing. While maintaining that there was value in letting anonymous editors create articles, Wales responded to the public scrutiny of Wikipedia and, in December of 2005, ultimately made the decision to prevent unregistered users from creating new articles.

To mitigate the effects of this new barrier, Articles for Creation (AfC) was created, a project where unregistered users can request that registered users create an article for them.

Since then, AfC has evolved into a project where registered users can send in a draft of their article for peer review and approved drafts are given a stamp of approval for publication in the main article space. While users with unregistered accounts attempting to create an article must go through AfC, registered users creating an article are given prompts that lead them to the AfC process via the Article Creation Wizard (see Figure 4.7).

My interviews revealed that newcomers viewed AfC as an almost mandatory part of the user experience on Wikipedia. As one user described it, they recall using AfC as a result of stumbling upon it while simply following instructions.

I think that at some point in the process it said to do something like that and you know I was just kind of following rote instructions.

(Interview with Daniel, February 27th 2015)

Like Daniel, Brianne expressed coming across AfC as if it was something of a requirement for creating a new article.

It was one of those things where this is if you want to do a new article this is how you do it and I was oh okay. This seems to be a proper process, a proper way to do it and okay if you do everything properly and follow the procedure to do it and then put it up.

(Interview with Brianne, February 17th 2015)

The Article Creation Wizard uses a decision tree that asks a series of questions about the topic of the article, whether or not the editor has access to good sources, and if the article will be written with a neutral and unbiased tone. If the editor successfully reaches the end of the decision tree, they are given the option to write their article in a draft space that they can then submit for review by members of AfC. Reviewers on the AfC project draw from a set of

reviewing instructions articulated on the AfC project page⁸. Here, reviewers are provided with a workflow for reviewing articles that is broken down into two review sections: quick fail and content review. Quick fail focuses on determining if there are serious copyright issues or vandalism. If the article passes these criteria, reviewers move on to assessing the content of the article. In the content review, attention is first given to whether or not the topic is encyclopedic, then to whether or not the topic is notable, the author has used reliable sources, and whether or not the tone of the writing is neutral, amongst other criteria. When I reviewed twenty of the most recent rejected articles, the majority were rejected based on issues of notability. Indeed, in the detailed description of how to conduct a review, after getting past the quick fail criteria, notability is described as the “most basic standard of inclusion in Wikipedia.”

In my interviews and observations, I encountered newcomers who had their work rejected in the AfC process based on the standard of notability. In some cases, they battled through multiple rejections to eventually have their work accepted, while in other cases, they ended up avoiding the process completely. One of the examples of being rejected based on notability that I observed was for a newcomer I will call Harry. While I never had the chance to interview him, I was able to reconstruct his experience as a newcomer through the traces of participation available to me through his edit history and talk page activity. As soon as he had created an account, Harry set out to write an article about a contemporary artist. They immediately made a 7,000 character contribution that described the young artist’s life history, reflecting on the artist’s motivation to leave their home country, their success in America, and

⁸https://en.wikipedia.org/w/index.php?title=Wikipedia:WikiProject_Articles_for_creation/Reviewing_instructions&oldid=697304255

descriptions of their art work. The initial contribution did not feature a single citation, and after submitting the article for review, it was promptly rejected, citing that the article did not meet the minimum in line citation requirements for the biography of a living person.

First rejection on July 5th 2014: *(Declining submission: - Submission does not meet minimum inline citation requirements (afch-rewrite 0.8))* (undo | thank)

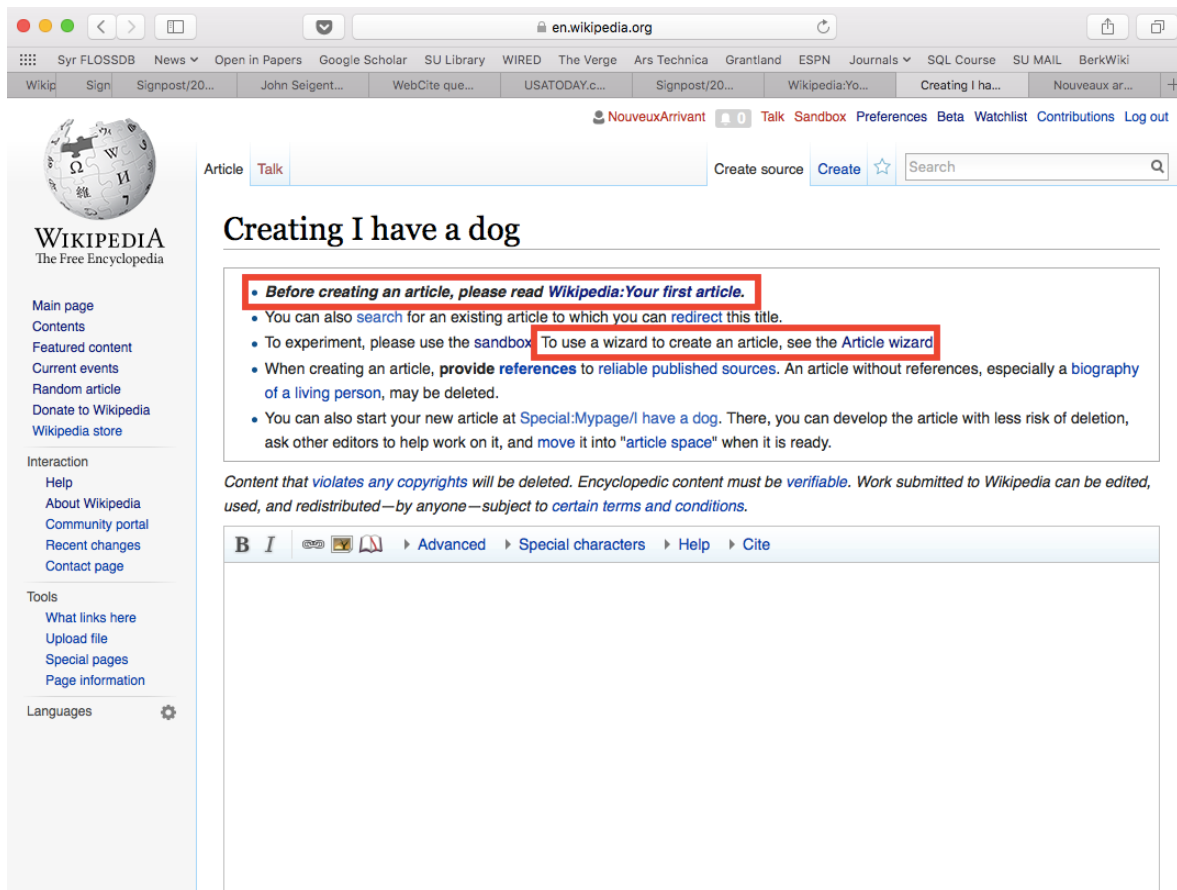


Figure 4.7 Example of creating an article that does exist with highlighted prompts encouraging user to read about creating an article or use an article creation wizard.

While notability is not mentioned in the reviewer's comments, citations are how the notability of a proposed article is determined, yet Harry does not appear to take this into consideration, as the second version of the article submitted for review is subsequently rejected after featuring only one citation.

Second rejection: 00:00, 10 August 2014 (+XXX) . . (*Declining submission: submission does not contain minimum citations (AFCH)*) ([undo](#) | [thank](#))

Finally, Harry not only takes the issue of citations into consideration, but he begins to solicit feedback on other ways to improve his article. One reviewer notes that the tone of the article is not neutral and appears to read like a promotional piece. Harry responds to this and makes significant changes to the tone of the article so that it focuses strictly on biographical fact. In addition to changes to the tone, he adds three citations and several external references. Yet the changes do not satisfy the reviewers and he is again rejected.

Third rejection: 00:00, 27 August 2014. (0,000 bytes) (+000) . . (*Declining submission: bio - Submission is about a person who does not meet notability guidelines (afch-rewrite 0.8)*) ([undo](#) | [thank](#))

In the days that follow, Harry appeals his case to his reviewers. Where some of the reviewers challenge the reliability of the sources he is using, he pushes back and makes an argument for the value of the sources he has used. In his argument, he states that he has eliminated nonneutral wording and emphasizes the independence and neutrality of his sources, further noting that he has eliminated any sources that were previously deemed nonneutral. Finally, he suggests that the criteria for inclusion on Wikipedia should also align with the criteria that well-known galleries used when they selected the artist in question. Despite his appeal, the reviewers reply that his argument does not change the way in which reviewers enact the general guidelines of notability. Determined, Harry makes more changes to the tone of the writing, adds a few more citations, and submits his article to be reviewed. On his fourth attempt, he is successful.

Fourth try= acceptance: (cur | prev) 00:00, 17 October 2014 m . . (7,371 bytes) (0) . .
(User__ moved page _____: Publishing accepted Articles for creation submission
(afch-rewrite 0.8)) (undo | thank)

Authority-Subject Presence in the Routing of Newcomers to Authority

The strategy of routing newcomers to authority describes strategies that experts on Wikipedia have deployed to create a stable region of participation among newcomers who could potentially disrupt and deviate from existing standards of participation. In all of the examples, the primary characteristic that reflects Sørensen's authority-subject presence is the gathering of attention from one region of participation to another. In all of the examples, I describe how two distinct boundaries of practice, one for experts and one for newcomers, is performed when the attention of newcomers is drawn by Hostbot to the Teahouse, or by a prompt in the editing interface to the Articles for Creation space. In these examples, a newcomer's attention is drawn to a region of expertise that works to create a predictable and stable environment by defining what knowledge a newcomer should learn or what feedback they need to receive in order for their work to meet participation guidelines and policies.

In the case of AfC, the project interface acts as both the boundary between newcomers and experts and as the location at which the attention of newcomers is gathered and directed to the authority of experts. The region of the reviewer is saturated with authority that is recognized by the newcomer and who makes themselves subject to the reviewer by granting them the authority to accept or reject their work. Furthermore, the authority of the reviewer's region is defined by rules of conduct, where the experts follow a prescribed reviewing process defined by flowcharts and other guidelines while newcomers, should they choose to, must follow the feedback given to them. The region of the newcomer is also defined by the

placement of their work in the draft space, a namespace on Wikipedia that indicates the work is not a live article but rather, is undergoing review by members of the AfC project.

Rejection and restriction are performed by the AfC process that responds to newcomers whose work is being reviewed. AfC guides newcomer participation by outlining what their contributions should look like. It provides a set of instructions that newcomers must adhere to if they want their work to be accepted. The actions of newcomers must keep pace with the directions of the reviewers if they want their work to be accepted. The reviewers deploy immutable objects like policy to inform the actions of newcomers and align the newcomers work with standards of practice, therefore making their work both more predictable and homogeneous.

Speaking to the broader question of formal points of entry, AfC presents itself as mandatory point of passage for newcomers looking to create articles. Many of the people I interviewed indicated that they were not aware of any other option outside of AfC when it came to creating an article. By the seemingly mandatory nature of AfC, its move to segregate newcomer work before it is approved, and the very act of approval to ensure that work aligns with existing standards of practice, AfC presents itself as a barrier for newcomer participation.

In the case of Hostbot, Teahouse, and the Wikipedia Adventure, Hostbot plays an integral role in drawing newcomers that have been defined as good faith editors by the scoring algorithm to newcomer support spaces. In drawing newcomers to support spaces, Hostbot focuses the attention of new editors on spaces that are saturated with authority. Such spaces are occupied by expert users who take it upon themselves to present newcomers with a curated set of practice standards or point newcomers toward such standards on a case-by-case

basis. Whatever the result, Hostbot actively positions newcomers to be subject to the authority of experts who promote standards of practice that they subsequently encourage newcomers to apply to their work.

Newcomer participation in the Wikipedia Adventure, one of the spaces saturated with authority to which Hostbot points users, performs what Sørensen would describe as authority-subject presence. Participation in TWA is performed in two distinct regions, one occupied by newcomers and the other by experts. The newcomer region is established by segregating newcomers not only from other users, but also by segregating them from the live project, placing them in a controlled environment where all newcomers receive the same instruction and apply their new lessons in the same way in a space that is separate from the live Wikipedia environment. TWA is designed to introduce newcomers to principles and techniques that the experts who created and manage TWA determine as being essential to successful participation. The second region, that of experts, is performed when newcomer attention is drawn to the TWA interface which, in the same way Sørensen describes the chalkboard in her classroom, is saturated with authority. By following the instructions delivered through the TWA interface, newcomer agency is constrained as they read and follow the instructions they are given.

Similar to TWA, newcomer participation in the Teahouse performs authority-subject presence. Here, a distinct boundary between a region of experts and a region of newcomers is performed. The Teahouse interface gathers the attention of newcomers to ask questions of hosts, or experienced Wikipedians. Here, hosts respond to questions by citing policies that inform newcomers about standards of practice. Most often, questions relate to issues of notability and why certain topics belong or do not belong on Wikipedia. In this case, hosts will

point newcomers to such immutable objects as policy documents. When a host does this, they create an alliance between themselves and the policy document, performing an authoritative region of practice that reaffirms their authority. Furthermore, they ask the newcomers to reference and apply these policies to their work so that their contributions can be aligned with standards of practice, helping to support a stable and homogeneous region of participation.

Authority-subject presence is also performed by the border protection that takes place on the Teahouse. Because there are no formal requirements in place to become a host on the Teahouse, hosts actively monitor the responses and the accounts, providing responses to ensure that newcomers are not crossing over into the region of experts and providing inaccurate information. Furthermore, the performance of this region as enacted through boundary protection is also evident in the growing conversation to establish requirements for being a host, stemming the flow of potentially unproductive comments from newcomers.

Looking across TWA and the Teahouse, and their respective relationships to Hostbot, I observe explicit strategies on the part of expert Wikipedians to immediately position good faith newcomers in relationship to the authority of established standards of practice. Whether this is performed by encouraging the newcomers to ask questions of experts or to take a tutorial, the assemblages that surround Hostbot, the Teahouse, and TWA work to situate newcomers within a homogeneous region of practice by aligning them with standards of practice that define work of acceptable quality on Wikipedia.

4.2.3 Conclusion: Varying Degrees of Constraint on Newcomer Participation

The theme of formal points of entry describes explicit strategies across both cases designed to capture and direct the attention of newcomers toward spaces in the project that are saturated

with the authority of project experts and leaders. In some cases, we observe tutorials that give newcomers the opportunity to practice contributing without impacting the ongoing activities of the project, or ask questions of experts who are tasked with responding based on particular protocols of interaction. In these examples, newcomers are brought into spaces of participation where not only are they fed standardized information, but those imposing their authority do so within a tightly constrained environment as well.

The two dimensions of formal points of entry, boundary of practice and knowledge and routing newcomers to authority describe different strategies that impose varying degrees of constraint on the newcomer's initial experience in a project. In the dimension of boundary of practice and knowledge, there is no way to circumvent these strategies, and newcomers are immediately made subject to the authority of experts and leaders from their very first experience with the project. On the other hand, routing newcomers to authority describes a strategy where they start off by jumping into participating and, if their actions meet particular criteria of an algorithm or a decision tree, they are subsequently invited to participate in a support space. The primary difference between the two dimensions, then, is that in the latter case, newcomers have a choice as to whether or not they wish to be made subject to the authority of experts and leaders, deciding whether or not to adhere to the feedback they have been given.

Across both dimensions and the respective strategies described in different examples, I observe different approaches for balancing the need for low barriers to entry against the need to achieve a particular degree of quality in the work of newcomers. While I do not present data on newcomer retention and work quality for all of the examples, the persistence of each

example across the cases suggests that, however imperfect some of the features may be, they exhibit some degree of long-term utility toward achieving the goals of a project, implying that some constraints on initial participation are, in fact, feasible at the periphery of project participation.

4.3 Ad-hoc Points of Entry

Formal points of entry describe features of platforms designed explicitly to engage newcomers in opportunities to learn more about how to contribute. While this accounts for the majority of the examples in my research, I also observed another feature on Wikipedia in particular that is actively used but is not designed to be a space where newcomer learning takes place. The emergent nature of this feature as a point of entry for newcomers led me to set it apart in my analysis from other features like tutorials and other help spaces where newcomers are invited to participate. In the following example, I describe how a particular feature on Wikipedia, coupled with a host of tools used by experts, created a distinct and prominent example of how experts lay claim to the periphery not by formal channels, but through ad-hoc modes of engagement.

4.3.1 Talking Through/With Templates

The talk page has emerged as a critical juncture between regions of participation for newcomers and experts. On the talk page, newcomers receive feedback about their work from experts who patrol recent changes to articles to ensure that such changes reflect content quality standards. When a message is left on a newcomer's talk page, their attention is gathered and directed there. Messages from experts often address concerns about the work

the newcomer has done. Such messages feature explanations about how their work does not fit with existing standards of practice as well as directives about how the newcomer should shape their subsequent work. While the role of feedback is, indeed, not a new finding in the context of research on Wikipedia, it is the catalyst for the delivery of feedback as well as the origin of the feedbacks' content that are of particular interest here. As I show in this example, the majority of the feedback received by newcomers arrives in the form of a template message, created and maintained by experts in spaces of the project that, while newcomers can technically make changes, they are normatively excluded from doing so. Furthermore, experts find opportunities to give feedback by using algorithmically assisted editing tools that detect work by newcomers that may not align with standards of practice. Examining the convergence of algorithmic tools that detect newcomer work, the standardized form of feedback created and maintained by experts, and the directing and focusing of newcomer attention toward instructions on how to participate all point to a convergence of relationships that produce what Sørensen would define as authority-subject presence.

The Wikipedia User Talk Page Bullseye: The Feedback Assault on User Talk Pages

The user talk page on Wikipedia is intended to facilitate social interaction between users for the purpose of working on articles. Indeed, one can find that users will have discussions about articles they are working on by leaving messages on each other's talk pages. This form of dialogue, however, is less common for newcomers, where it is more common to find a newcomer's talk page populated by template messages left by more experienced users.

Template messages on Wikipedia range from standardized welcome messages (see Figure 4.8), which provide an overview of help resources, links to policy pages, and a

description of different ways that newcomers can contribute, to more ominous messages indicating that a user’s work does not adhere to guidelines and policies and has therefore been either reverted or deleted. The content of template messages is stored in a unique namespace on Wikipedia, where each message has its own page where users can discuss the content and purpose of the message. Categories of template messages also have WikiProjects dedicated to the maintenance and use of the messages.

Templates are inserted into user talk pages by pasting a small string of syntax like the following six-word string used to warn about potential copyright violation: “`{{subst:uw-copyright|Article|Additional text}}`.” This six-word string then produces a 119-word message (see Figure 4.8).

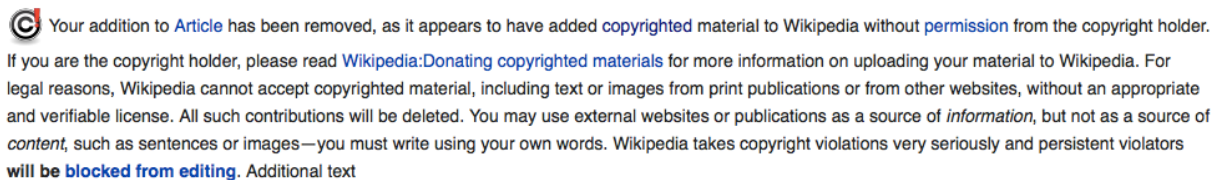


Figure 4.8 Text from the template message regarding potential copyright issues

Template messages can also be inserted into user talk pages using semi-automated editing tools that streamline the editing process by providing users with a drop down menu featuring lists of template messages (see Figure 4.9).

Research shows that the latter type of message reflects the norm for what newcomers find on their talk pages. For example, in 2011, almost 40% of all initial edits to a new user’s talk page were templates expressing negative feedback; any kind of praise to new users was almost nonexistent (Pinchuk, 2011). Adding to the seemingly harsh climate for newcomers, research

has also shown that by mid-2008, nearly 75% of first messages that users received were delivered by an algorithmic tool (Halfaker, Geiger, Morgan, & Riedl, 2013a).

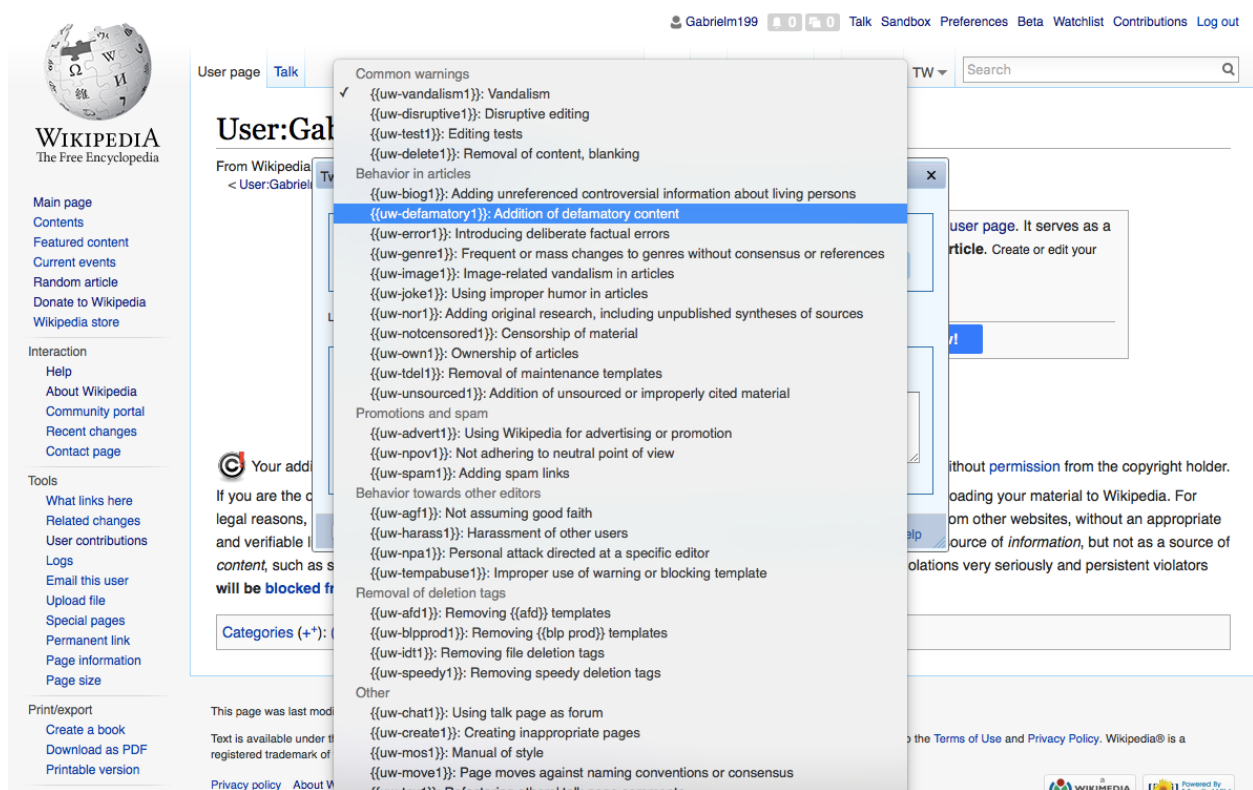


Figure 4.9 Twinkle tool showing drop down menu of template messages

Samuel, an experienced Wikipedian with over 8,000 edits, described to me how the user talk space for a newcomer is less a space for dialogue with other users than it is a space where a newcomer is told when they are doing something right or wrong.

For very new users the talk is the first and probably a unique place where we can communicate with them if there is any issues with any articles they'll be working on or you're able to put the learning template on the pages...maybe they wrote an article and it should be deleted or they wrote an article that was declined in the article for creation process.

(Interview with Samuel, February 17th 2015)

Because of the alarming regularity with which newcomers receive negative feedback on their talk pages, the apparent cultural norm is that a user talk page is where experienced Wikipedians discipline newcomers. Combined with the fact that over 75% of first messages on a newcomers talk page arrive in the form of a template (Halfaker, Geiger, Morgan, & Riedl, 2013a), the talk page of a new Wikipediaian presents itself as an important site of newcomer learning on Wikipedia. While there is extensive research highlighting the role that feedback plays for the performance and retention of newcomers to online communities, what I emphasize here is that the talk space, as a feature of the Wikipedia platform, has emerged as a space for shaping how newcomers learn and participate, and that much of the interaction between experts and newcomers that takes place in user talk is performed by experts either manually pasting template syntax, or using a semi-automated tool or fully automated bots that detect characteristics of newcomer behavior that merit a template message of some kind.

The overwhelming presence of templates on a user talk page is also evidenced in my observation of and interview with Jesse, a newcomer who joined in late August of 2014. For Jesse, seven of the first 10 edits on his user talk page were generated by templates. The first message he received was a welcome message (see Figures 4.8 and 4.10) left by a Wikipediaian using the semi-automated tool Twinkle. In this message, Jesse is encouraged to look at links that take him to pages that describe the Five Pillars of editing on Wikipedia, provide an editing tutorial, and outline the manual of style among many other resources relevant to newcomers. In my interview with Jesse I asked him to describe how the presence of this template message during his initial experience impacted his contributions to Wikipedia.

By reading how to create my first article I learned how to edit and by reading the five pillars of Wikipedia I learned how to stick to wiki policies in order to keep the created pages on the internet.

(Interview with Jesse, August 5th2015)



Figure 4.10 Welcome template deployed in the researcher's sandbox

A few days after the welcome message was placed on Jesse's talk page, another template message appeared, nominating an article he had created for "speedy deletion," a designation used to describe new articles that meet a specific set of criteria where discussion for deletion can be bypassed. That same day yet another message was left by CorenSearchBot, a fully automated bot that compares the content of new pages against web searches to determine whether or not new page content has been copied from existing websites. The message left by the bot indicates that its search revealed a high likelihood that the content of the new page was pasted from an existing website. When I asked Jesse about how he dealt with

receiving a speedy deletion notification and a copyright violation notice from CorenSearchBot, he described how the feedback forced him to not only develop the content further, but also directed him toward writing the article in his own words.

It made me reedit all the article I had written before the message. And from then on I tried to write articles in my own words.

(Interview with Jesse, August 5th 2015)

Despite a rocky start to his experience on Wikipedia, Jesse has continued to edit since August of 2014, receiving a “Did You Know” nomination for the first article he started working on. He has gone on to make over 1,500 edits to the main article space, with only 38 of his edits being deleted.

The User Talk Page and the Production of Subject

Unlike the formal points of entry, the user talk page is not a space designed explicitly for shaping the actions of newcomers. There is no prescribed path of actions that the user talk page forces newcomers to take, yet it has emerged as a critical juncture in their experience of learning how to participate. Between the consistency with which newcomers receive messages on their talk page and the standardized language of these messages, newcomers can expect to find content on their talk page that will help them get a baseline understanding of what it means to contribute. Whether the messages are of the welcoming sort, suggesting various resources for learning how to contribute, or feedback about their work, the talk pages of the users I observed and interviewed became libraries of template messages reflecting policies and guidelines that, for some users, helped them to become active contributors and for others, acted as reminders of the obstacles they could not overcome.

Existing research shows that user talk page feedback can lead to quality contributions over time by newcomers (Geiger et al., 2012). What my findings suggest is that the feedback newcomers receive is not simply a message delivered from an expert to a newcomer, rather it is a conversation between a newcomer and institutional knowledge codified in the templates that appear on their talk page. Wikipedians who deliver these template messages to newcomers take part in perpetuating a homogeneous region of practice by introducing these immutable objects into the newcomer's experience. The insertion of such immutable objects that reflect definitions and standards of practice into the newcomer experience suggests a different perspective to the image of a lurking newcomer to Wikipedia. Rather than newcomers seeking out information about how to participate, my findings show that their participation results in a library of project standards being broadcast to them on their user talk page.

While the feedback is reactive and tailored to the activity of the newcomer, this ad-hoc point of entry is supported by an alliance of actors defined by meeting the needs of project maintenance by addressing the actions of newcomers. As described in the section on formal points of entry, tools like Hostbot are designed to identify good faith editors and provide invitations to newcomer support spaces. Projects like the Welcoming Committee provide links to logs of new user accounts, welcome templates, and guidelines for interacting with newcomers. Similarly, semi-automated tools like Snuggle provide lists of good faith editors and welcome templates that the user can leave on their talk page. All of these actors are aligned to draw the attention of newcomers toward the region of template messages which reflect the authority and consensus of many expert Wikipedians around what the project standards are and how to communicate them. The alliance of actors working to draw the attention of

newcomers toward this region of practice, saturated with the authority of expert Wikipedians, performs authority-subject presence, where, like the blackboard in Sørensen's classroom, the talk page serves as a nexus between the region of expert practice and the region of newcomer practice. At this nexus, not only are newcomers focused on the authority of the experts, they must also pace their contribution activities with the directives articulated by experts in the template messages. As the Jesse's experience demonstrates, the messages on his talk page required him to apply the requests articulated in the messages to his work or else his contributions would be removed from Wikipedia.

The alliance between the talk page, the template messages, the fully and semi-automated tools that store the libraries of messages, and the users that deploy them demonstrate how experts lay claim to the periphery of participation through ad-hoc tactics in an attempt to perpetuate standards of practice. While this maintenance work is indeed reactive instead of proactive as are some of the formal points of entry, the assemblage of actors that perform this work is well organized by experts to actively make newcomers subject to their authority.

[4.3.2 Ad-hoc Points of Entry as a Both Premeditated and Reactive Strategy](#)

To summarize, the dimension of ad-hoc points of entry describes a simultaneously premeditated and reactive strategy used by experts to control participation at the periphery of projects. In ad-hoc points of entry, project experts develop a series of algorithms and libraries of template messages that lay waiting to detect and engage newcomers around specific actions. Over the course of their initial experience contributing to a project, a newcomer will receive a combination of different template messages addressing particular issues with their work. While

the sequence of messages that a newcomer receives is unique to their experience, the actions that they engage in and the messages that are delivered to them are part of an established tactic for contending with newcomers. Because of the standardized approach to both detecting and responding to newcomers, the examples of ad-hoc points of entry describe an authority-subject relationship, where the tactic entangles newcomers in stable, predictable, and homogeneous regions of participation shaped by the authority of experts.

It is worth noting here that I did find an emergent space for newcomer learning in Planet Hunters that paralleled my findings in Wikipedia. On the Planet Hunters talk page, newcomers described drawing on the comments of other users as a way to learn about how to participate. The participants I interviewed described how the comments provided a unique opportunity to see descriptions of how people would do work in the classification interface. While this was indeed an intriguing finding, describing an emergent feature used by newcomers to learn about how to contribute, it did not align with the broader theme of points of entry which describes how experts lay claim to the periphery of participation. While I did see occasional comments from the science team, they were few and far between, suggesting that there is no established approach similar to what I observed on Wikipedia to control the content that newcomers draw on to learn. Because of the lack of apparent tactics to control and define content that newcomers draw on in the talk space, I did not include this as an example of ad-hoc points of entry in my findings.

4.4 Points of Entry Conclusion

I have described different strategies that project leaders and experts deploy in order to lay claim to the periphery of participation, shaping the way in which newcomers learn and contribute. The image of the newcomer arriving at the periphery of the project, lurking and making small contributions on their way to becoming a more involved and impactful contributor, has served as the dominant conceptualization of newcomers to online collaborative spaces (Bryant et al., 2005; Preece & Schneiderman, 2009). In light of the examples in this chapter, this gradual approach to learning how to contribute may no longer be an accurate reflection of the newcomer experience to a mature peer production project like Wikipedia and a crowdsourced project like Planet Hunters.

My findings demonstrate that both Planet Hunters and Wikipedia have well-defined strategies and emergent tactics designed to place newcomers into a position subject to the authority of approved knowledge and standards of practice that must be applied to their work. For Planet Hunters, newcomers are required to go through the tutorial and are provided with easily accessible resources to refresh their understanding about project knowledge and objectives. In Wikipedia, new users are actively recruited to participate in newcomer support spaces where they can take tutorials, ask questions of experts, or have their new articles reviewed by experts. Furthermore, the feedback that the majority of newcomers receive on Wikipedia is template feedback, meaning that they are receiving messages that reflect broad consensus about how to communicate standards of project practice to new participants. The strategies in both cases also demonstrate how the projects often separate the newcomers from

the general population by giving them simulated work to do that has no impact on the project or separates their intended contributions for review before they can be included.

While these tactics, in the case of the peer produced Wikipedia, are reflective of a mature project, in a crowdsourced project like Planet Hunters, they are built into the core. With these findings in mind, the perspectives of the newcomer experience perpetuated by theories like the Reader to Leader Framework (Preece & Schneiderman, 2009) or Becoming Wikipedian (Bryant et al., 2005) are perhaps more fitting for early-stage peer production projects where project governance has not developed formal strategies or ad-hoc tactics to manage the periphery of participation. Finally, while there may be low barriers to creating an account on both of these projects, my findings suggest that low barriers to participation as a concept obfuscates the guardrails that route newcomers away from immediate contribution toward spaces where they are made aware of how work should be done.

Chapter 5: The Inclusion and Exclusion of Newcomers

5.1 Introduction

What does it mean for a newcomer to have their work accepted or rejected on a participatory platform? Research on F/LOSS projects highlights the role of newcomers establishing political alliances in order to have their work accepted (Ducheneaut, 2005; Krogh et al., 2003) while newcomers to Wikipedia often contend with having their edits reverted (Halfaker et al., 2011). In both cases, the acceptance or rejection of a newcomer's work is often mediated by a relationship between the newcomer and project experts and leaders, where the latter makes a decision about whether or not the newcomer's work is valued and will have an impact on the project. However, focusing on what amounts to interpersonal dynamics in the act of including or excluding the work of newcomers is deeply asymmetrical when exploring the newcomer experience in digitally mediated environments. Drawing on the relational approach to analyzing phenomena used by Sørensen, this chapter explores the inclusion and exclusion of newcomer work by focusing on the configuration of human and nonhuman actors when these moments occur. In particular, I look at how newcomers negotiate these existing configurations of practice, finding themselves in alignment or repeatedly finding themselves in tension with existing configurations, and in some cases challenging existing approaches to practice and trying to pave their own way.

Examining how a newcomer's work is included or excluded combines attention to the binary question of whether their work is accepted into a project or is rejected, along with a

more qualitative understanding of how a newcomer comes to understand their relationship with the goals of a project as well as with the tools and the people that define the infrastructure for participating in the work to achieve these goals. In this chapter I begin by describing what inclusion, or alignment with project standards, experts, and leaders looks like. Looking across the cases, I describe how, for example, algorithmically driven editing tools on Wikipedia frame the vision and voice of newcomer work and how the contributions of newcomers to Planet Hunters are processed to meet the needs of scientists. I then explore the theme of exclusion, where newcomer work is rejected and how, in such moments of exclusion, newcomers find themselves in spaces of the project where they appear to be in exile or in a refuge from the authority of project experts and leaders. Drawing on Sørensen's forms of presence, I unpack these various examples to describe the relationships among newcomers, project experts, leaders, and platform features, and how these relationships reflect the different ways newcomer agency is constructed at the periphery of participatory platforms. By exploring this question of the performance of newcomer work as being included or excluded, this chapter further explores the question of how participatory platforms manage the periphery of participation, focusing in particular on how newcomers negotiate and situate themselves in existing practice so that their work will be included.

5.1 Inclusion

The experience of a newcomer to any social setting is often described as one of making sense of other people's behaviors and aligning oneself accordingly (Goffman, 1959). On participatory platforms, newcomers must socialize themselves, learning the lingo and building up connections with established members (Coleman & Hill, 2005; Ducheneaut, 2005; Fang &

Neufeld, 2009; Krogh et al., 2003; Qureshi & Fang, 2010). By building up an understanding of and relationship with existing members and their participation, newcomers are more likely to have their work accepted; however, making the case for the value of one's participation on a project is not always a matter of knowing the right people or knowing how to say the right things. Rather, making the case for one's value to a project can be a function of their relationship to and use of particular platform features that constrain their actions along the boundaries that have been defined by experts or leaders of the platform. In this theme of inclusion, I expand on our understanding of what it means for a newcomer's work to be included by focusing on how their relationship with different platform features can play an important role in aligning their contributions with existing standards of practice. I begin by describing the dimension of *automated bounding of practice*, where platform features not only help to focus the attention of newcomers on important aspects of practice in the projects, but also provide them with delimited options for making contributions. In other cases, newcomer work is processed so as to ensure their contributions are of value to the project, regardless of their accuracy. In the dimension *performing traces of participation*, I build on the concept described by Lave and Wenger (1991) that observing ongoing practice is important to newcomers, and I describe how newcomers can copy and paste aspects of others' work so as to ensure that their contributions are aligned with the standards of practice.

From examples like the copying and pasting of existing formatting syntax on Wikipedia to the computational consensus models that process the contributions of volunteers on Planet Hunters, the theme of inclusion will show that the work of newcomers negotiating and situating themselves within established standards of practice on participatory platforms often involves

not only describing the relationships they develop with the features of the platforms, but also defining the relationships that constitute the functionality of these features.

5.1.1 Automated Bounding of Practice

The dimension of automated bounding of practice describes a performance of participant inclusion that comes from newcomers operating in a close-knit relationship with the directives from leaders and experts. For both Wikipedia and Planet Hunters, I describe features in the newcomer experience that focus their attention around specific aspects of the broader goals of the project, limiting their participation to following a set of instructions and choosing what amounts to multiple choice options for contribution. For example, in Wikipedia I describe an interface that presents a user with recent edits that have been detected by an algorithm as being potential vandalism, with a suggested set of options for how to respond to the edit in question, along with a list of template messages used for communicating with the offending editor. Similarly, I describe how on Planet Hunters, newcomers are given a tool for zooming into the light curve data with fixed zoom levels that have been determined by the science team as being the optimal levels for analyzing data.

What I will demonstrate with these examples are the various ways that newcomers relate to these limited options for participation, defining their participation, sense of purpose, and commitment to project goals through their relationship with the affordances and constraints of these features, and how a broader configuration of relationships converge to align the contributions by newcomers with project standards and goals. Drawing on these findings I also demonstrate how the newcomer's relationship with some of these features accelerates the position of a volunteer's value to a community, suggesting that the gradual

nature of learning suggested by such theories as legitimate peripheral participation (Lave & Wenger, 1991) is at times fast tracked, with a newcomer suddenly shifting from peripheral or no engagement to making contributions that are integral to the stability and success of the project.

Framing Vision and Voice

Nancy is a Wikipedian who started contributing six months before I first spoke to her. At the time of the interview, Nancy had just started her freshman year in college and was pursuing a degree in computer science. Before interviewing Nancy, I reviewed her edit history using the edit summary tool. Looking over edit history I found that she had made 7,038 edits, of which 60% were made in the article space and 25% were made in the user talk space. Digging deeper into the data from her edit history, I observed that 45% of her edits (3,192 edits) were made using vandal-fighting tools like STiKi and Twinkle.

STiKi and Twinkle are part of a class of editing tools on Wikipedia called semi-automated editing tools, or what Geiger and Ribes (2010) describe as assisted editing programs. These tools “perform algorithmically defined tasks”, for example, identifying potential vandalism and providing options for how to respond to the vandalism. With semi-automated tools, a user is presented with what the algorithm believes to be vandalism, leaving it up to the discretion of the user to revert the edit, restoring the content to its state prior to the vandalism. The role of semi-automated tools has grown since they emerged in 2006, with over 12% of all edits to Wikipedia being accounted for by semi-automated tools in 2009 (Geiger & Ribes, 2010). In particular, much of this work comprises countervandalism work, an important aspect of

maintaining the quality of articles on Wikipedia (Geiger & Halfaker, 2013b; Halfaker, Geiger, Morgan, & Riedl, 2013a).

The role of semi-automated tools in Wikipedia has been linked to a broader phenomenon described as algorithmic governance (Müller-Birn et al., 2013). Governance, as a concept, reflects the construction and maintenance of order on Wikipedia, pointing to the growing number of policies and guidelines for participation and their enforcement by human editors (Butler et al., 2008). An instance of governance in action might be when a Wikipedian asks another to provide a citation for a recent edit, where this example reflects the enforcement of rules relating to the need for content that can be tied to credible citations. Bots can accomplish similar tasks, like identifying work that could potentially violate copyright policy and informing the offending editor that this needs to be changed. The difference, then, between human-enacted governance and bot-enacted governance is the scale of actions, with bots detecting and responding to infractions at a larger scale than humans alone can handle.

The important role that bots play in managing quality has been evidenced in the moments where some bots cease to operate, overwhelming human editors and increasing the average amount of time that vandalism persists on articles (Geiger & Halfaker, 2013b). The powerful role that bots can play on Wikipedia is taken seriously by Wikipedians, with specific policy and work groups existing around the development and approval of fully and semi-automated tools on Wikipedia. The pages on bot policy and the Bot Approval Group (BAG) act as spaces on Wikipedia where expert Wikipedians converge and develop consensus on rules about bot development and use. Here, members of BAG oversee what bots make their way into the ecosystem that define the algorithmic governance of Wikipedia.

In the case of the STiki (see Figure 5.1), which Nancy frequently used, the tool is built on a machine learning algorithm that draws on a corpus of questionable edits established by STiki's developers. The algorithm scores edits and presents those edits that may qualify as vandalism to end users⁹. Should a user decide that the edit they are presented with counts as vandalism, they are given a template message to leave on the offending editor's talk page indicating that their work was reverted.

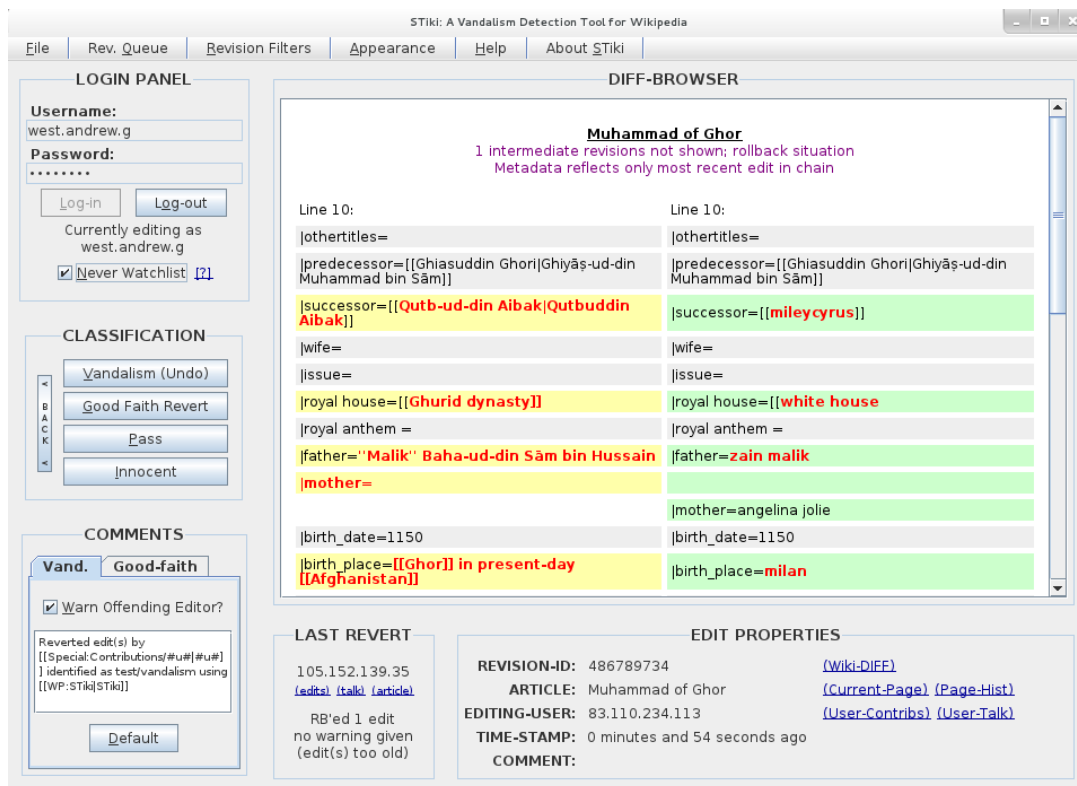


Figure 5.1 STiki interface

https://en.wikipedia.org/wiki/Wikipedia:STiki#/media/File:STiki_screenshot.png

⁹ <https://en.wikipedia.org/w/index.php?title=Wikipedia:STiki&oldid=684909241>

Nancy started using semi-automated tools on August 10th of 2014. In the month of August, her edit summary data indicates a 630% increase in edits to the user talk space (see Figure 5.2) compared to the previous month (67 edits in July to 423 edits in August). The edits she makes to the user talk page are generated by templates for feedback provided by the semi-automated tool and her attention to the work of these users is directed by the algorithm in the tool that detects questionable edits by these users. For the four months following, edits to the user talk space accounted for between 30-40% of her total edits (see Figure 5.2).

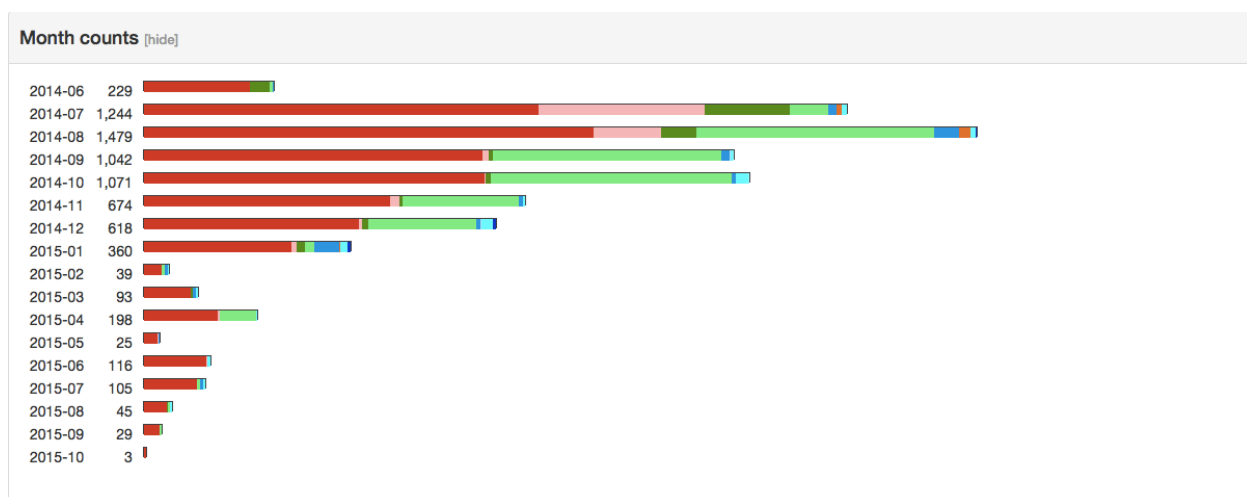


Figure 5.2. Edit activity summary where light green indicates user talk activity (retrieved October 9th 2015 using <https://tools.wmflabs.org/xtools>)

In one example, Nancy’s use of STiKi brings her to revert an edit that included a swear word. Nancy uses the STiKi interface to both revert the edit and then leave a template message on the offending user’s talk page indicating that their edit was reverted. Nancy describes to me how she has not had any editing sessions where she works on article development, rather she has spent most of her time engaged in countervandalism work.

I haven’t really have like a hard core editing session for a while...I used STiki a lot, the anti-vandalism tool, that was really great. There was a constant sense of movement

when you use STiki, there's always more to be done, you know, you get feedback pretty much, so that kept me going for a while. School really interrupted my editing.

(Interview with Nancy, February 15th 2015)

Nancy also points out that her use of the STiki tool increased after the tool developers increased the number of template options available for leaving feedback.

Just because STiki revamped basically four months ago, they basically have a ton more options for leaving messages on talk pages and I felt so much better about it because there are these templates you had before where they didn't necessarily fit...so yeah I think being able to leave more diverse messages but still not having to write them all yourself ... but yeah a lot of stuff on boiler plates and so forth

(Interview with Nancy, February 15th 2015)

For Nancy, the value of the semi-automated tool is not just that it helps her see what edits need her attention, but that it also helps her speak to other editors in an efficient manner that matches both institutionally approved language and a variety of contexts. STiki plays a role in positioning Nancy as a contributor that not only can identify important work that needs attention, but also as an experienced member that can communicate messages to other volunteers about how to correctly contribute to a project. The role that semi-automated tools play in quickly situating a new user into a position of value is echoed by another Wikipedian who described her early days of editing as being defined by such tools.

I used to do it a lot. There was one month where I made 11,000 edits using Huggle. I was 13, I wasn't a great writer or researcher, so it was the easiest way for me to contribute...On the one hand it provides someone who is a marginal participant in the community to make an entre to the more inner circles of the community and prove their utility.

(Interview with Kelly, September 11th 2015)

Both Nancy's and Kelly's experience suggest that, if someone is either inexperienced or short on time, the semi-automated tools can play an integral part in a volunteer's ability to instantly make large scale contributions that are critical to the sustainability of Wikipedia. In

reviewing Nancy's edit history, we see how her use of the tool reflects a moment where a broader and sudden shift in her work took place, moving from adding new content to articles to engaging in maintenance work. Shifts from primary tasks on participatory projects (e.g., adding new content to an article) toward maintaining a group of articles has been described as a part of a trajectory toward sustained participation (Crowston & Fagnot, 2008). As Nancy shifts toward this new mode of managing the quality of a large number of articles, she describes her use of the tool as playing an important part in how she supports the goals of Wikipedia. By incorporating STiki into her practice, her use of the STiki tool situates her in a region of practice that is algorithmically defined by her relationship with a tool that acts both as her eyes, directing her attention toward edits that might reflect vandalism, and her voice, providing her with templates for leaving feedback on a user's talk page. By situating Nancy within a stabilized region of practice, STiki makes Nancy subject to the authority of this stabilized region of practice, constraining and enabling her agency, defining the actions she will take to execute and perpetuate article quality standards.

The role that platform features play in situating newcomers within stabilized regions of practice was also observed in my interviews and observations of newcomers to Planet Hunters. In the following section, I explore a similar phenomenon in Planet Hunters, where newcomers find a sense of purpose in the project that emerges from their relationship with particular tools and, in turn, become situated in regions of practice where they are made subject to the needs of project scientists. In the same way that the above case about STiki shows how a newcomer's practice is framed, so too will the following case demonstrate the various ways

that the Planet Hunters platform provides features that work to constrain the participation of newcomers so that they align with particular standards of scientific practice.

Making Every Contribution Count

It is May of 2014 and I am sitting in a conference hall at the Adler Planetarium in Chicago for the annual ZooConference, or ZooConf for short, one of two yearly meetings where members of the globally distributed Zooniverse team come together to meet and discuss project development and research. The talks range from education designers presenting results from experiments on user engagement to software developers showing off features for the new social platform they will be rolling out. One of the lead project developers is giving a talk about “reaching consensus” which looks at the varying procedures and statistical tools that can make the contributions of volunteers more useful to scientists. The speaker goes through an overview of different techniques that Zooniverse projects might consider for processing volunteer annotations, including comparing volunteer contributions to expert contributions or developing probabilistic models of participation based on initial tests of volunteer activity which can help “correct” a contributor’s answers. Since the speaker’s presentation only goes over points that are not yet or may never be implemented into projects, the urgency of his talking points is not immediately evident to me. It is not until an interview with an experienced member of Planet Hunters that I am prompted to revisit my notes from the talk and realize their importance to the broader vision of how the designers of the Planet Hunters platform attempt to frame the experience of volunteers.

Maria is an experienced Planet Hunters volunteer with over 12,000 classifications. Maria is an executive secretary at a large insurance company in northern Europe. In our video

interview, I notice that she is drinking a glass of wine, which she points out to me, indicating she has had a long day at work and is winding down. I tell her that I won't keep her too long on the call, but she replies that she is looking forward to chatting about Planet Hunters and Zooniverse and that classifying images is usually part of her daily routine of relaxing after work.

Maria, like many of the people I have interviewed, is interested in science. She holds a subscription to a science-themed journal and regularly watches science-themed television shows. Unlike many of the people I have interviewed, she does not have a particular interest in astronomy. She points out to me that, like many of the projects she contributes to on the Zooniverse, her knowledge of the science behind the projects is very limited. These aspects of her background stand out, since my assumption going into the interview was that, with over 12,000 contributions to Planet Hunters, I would be interviewing a knowledgeable astronomy super-fan, and yet she is not. What I learn instead is that Maria is a fan of citizen science who has a firm understanding of the computationally derived consensus model on which all of the projects across the Zooniverse work. Indeed, it is her understanding of the consensus model that has led her to be repeatedly selected as a moderator for new Zooniverse projects.

Whenever a new project starts the project scientists ask me to be a moderator and I say that I know nothing about the topic but they say that what I do know is how the Zooniverse works, which I agree with so that's is why I moderate for so many projects.

(Interview with Maria, November 3rd 2014)

As a moderator, she reassures people who worry about having provided an incorrect answer.

She says that, since lots of people will view the same image, they should not worry about their response.

I know how the process of classification works, where the scientists get a consensus for decisions on a particular image. People who are new to the Zooniverse are always very afraid, thinking they made a mistake and wanting to correct it. When people say things

like this I step in and tell them that it's not that big of a deal because lots of other people will see it. So I have to explain how the process of classifying works. I'm not going to say, please make mistakes again, but I try to tell them that one mistake is not a big deal.

(Interview with Maria, November 3rd 2014)

While she is not a moderator for Planet Hunters, the relaxed attitude that Maria brings to being a moderator for other projects is evident in her approach to classifying light curves. Maria describes that when she started with Planet Hunters, she completed the tutorial and referred to other resources written by the science team.

I went through the tutorial, read content on the science page, and I went from there. It's not that difficult a task once you understand the basic premise of the project.

(Interview with Maria, November 3rd 2014)

When she classifies data in Planet Hunters, she only looks for easily identifiable transits and does not worry about whether or not her classifications are correct.

It is a very intuitive process for me, I don't bother with zooming in and looking at everything in the image, I click, I see, if I don't see a dip, I move on to the next one. If you do it like that you can classify a lot.

(Interview with Maria, November 3rd 2014)

Maria's approach and attitude about contributing to Planet Hunters reflects a theme I uncovered in other interviews with both newcomers and more experienced members, where participation is a matter of doing work in a way that satisfies a particular relationship with both the scientists in the project and the technical mechanisms that process the contributions by volunteers. Maria's approach to classifying is one that appears to satisfy the needs of the science team. As long as she is contributing, Maria knows that the aggregate of her work and that of others will provide the scientists with data to work with. Here Maria articulates her participation and work in the project as having a relationship to the technical mechanisms of data processing.

This theme of having a clear understanding of one's relationship to purpose and process of the project appeared in other interviews. For example, while they did not indicate an awareness of how the underlying data processing infrastructure works, Roger, a user who has been with the project for a few months, and Janice, a user who has been with the project for only a week, defined their sole purpose in the project as supporting the science team by following instructions given to them through the classification interface and tutorial.

I'm a helper; to try to sift through the mounds and mounds and mounds of data that Kepler has produced, and to try to whittle it own to those light curves that might have a possibility of transits, let the scientists take it from there.

(Interview with Roger, September 18th 2013)

These verbal declarations and actions reflect Roger's and Janice's interpretation of project goals as conveyed to them through the classification interface, tutorial, and other supporting content on the site. By focusing on the instructions from the science team via the classification interface, Roger and Janice position themselves within the shared goals of the project, executing the tasks that project designers and scientists hope volunteers will fulfill.

Whether an understanding of the data processing mechanisms or alignment with perceived roles, the examples of Maria, Roger, and Janice reflect how contribution through the classification interface, whether correct or incorrect, are valued and essential contributions to the project. Individual contributions of work through the classification interface, however granular and small, reflect the vision of the project designers who need volunteers to sift through and whittle away the tens of millions of light curve images down to a smaller, more manageable number of images. Furthermore, classification work also helps with another goal of

the project, which is to train a detection algorithm that could one day replace the role that human classifiers play in the project.

Reflecting on the talk given by the lead project developer at ZooConf in light of the experience of such users as Maria, Roger, and Janice, we see that supporting the core goals of Planet Hunters and projects across Zooniverse, is not a matter of knowing the science behind the task, rather it is more a question of knowing how to operate the classification interface. In understanding the technical aspects of the task, a user is immediately situated within goals outlined by the scientists and platform developers, with their data points being processed in such a way that their contributions are made to be aligned with the goals of the project.

Building on this theme of Zooniverse projects being driven by technical competency, I return to my time at the 2014 ZooConf where I am in a meeting with software developers about the release of the new zoom tool for the Planet Hunters interface. One of the developers talks about the design of the new zoom tool in the classification interface. The zoom tool (see Figure 5.3) allows a user to expand the time intervals on the light curve so that any shifts in brightness will be more evident. In this meeting, I learn that the new version of the zoom tool has two preset modes for zooming. This decision to have two fixed zoom levels was done in response to what the scientists observed as too much flexibility in the zoom function of the previous version of Planet Hunters. The software developer leading the presentation talks about how he, in conversation with the Planet Hunters science team, found that there were two time intervals at which to observe the light curve that could provide the quickest insight into the identifying presence of a transiting planet when analyzing light curves in the classification interface. Rather than leaving the zoom level choice up to the volunteer, the

developer and the scientists decided to fix the perception of the zoom tool to what the scientists determined as useful.

Similar to the discussion about consensus, the importance of my notes from the meeting about the new zoom tool did not reveal themselves until an interview I conducted with Lawrence, a newcomer, a few months later. In my interview with Lawrence, I find a newcomer who, like other volunteers, has a passion for astronomy, took courses in college on the topic, and is excited about the opportunity to contribute to scientific research. Unlike Maria, Lawrence tells me that he will often spend upwards of 20 minutes analyzing a light curve in the classification interface. Lawrence is aware that there are a host of calculation tools and methods that exist outside of the Planet Hunters platform that could help him perform more in-depth analysis, however, time constraints from his work and personal life prevent him from extending his activity beyond the classification interface. To supplement his desire to do more in-depth analysis, Lawrence describes to me how he uses the zoom tool feature on the classification interface as an integral part of his 20-minute analysis routine. The preset zoom intervals allow Lawrence to make a quick assessment about whether or not there are any anomalies in the light curve.

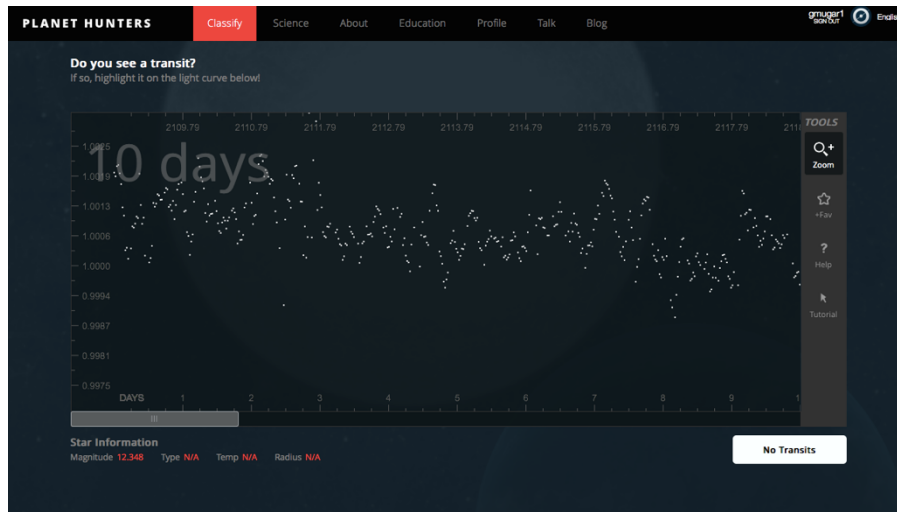


Figure 5.3 Zoom tool at preset zoom level of 10 days

Considering the background behind the development of the new zoom tool and the role that it plays in helping a volunteer conduct their work, we see how the zoom tool creates a user experience in which a newcomer is positioned in relationship to the science team, analyzing the light curves in a way that reflects the goals and desires of the science team, in turn making him a useful contributor to the project.

In the examples of the zoom tool and the classification interface, authority-subject presence is evidenced when newcomers are immediately made valuable contributors to the project. From the start, they are positioned in relationship to the needs of the scientists who, through the classification interface immediately provide newcomers with a legitimate and valuable task. Newcomers and more experienced members alike describe how they define their role in the project in relationship to answering the questions that are given to them through the classification interface. Becoming situated within an established region of practice and being made a functional and valued contributor is also revealed in the way that their contributions, regardless of their accuracy, are processed to be made valuable to the scientists, making the

continued and long-term participation of newcomers a primary objective for the science team. Newcomers are also situated in a stabilized form of practice in the way they are made to approach their analysis of the data like trained scientists would, by using the zoom tool calibrated to their preferences. By being made subject to the authority of the science team, newcomers immediately set off on their contributions to Planet Hunters on the right foot, offering contributions that are useful and valuable to the scientists.

Authority-Subject Presence in Automated Bounding of Practice Across Both Cases

This dimension of inclusion describes how a newcomer defines their role in a project, how they negotiate the act of making a contribution aligned with project goals, and how the performance of a newcomer's work is made useful through the integration of particular platform features that work to entangle the newcomer within well-defined regions of practice. In both examples, the configuration of relationships that the newcomers perform with other actors in the project are characteristic of authority-subject presence.

In both of the cases, an explicit sense of alignment with project goals and the implicit shaping and processing of participation performed authority-subject presence as evidenced in the following three ways that I speak to in turn: the role of a focal point for attention that directs user activity, distinct and persistent regions occupied by the subjects and authority, and the predictability of outcomes through restriction of activity.

The role that the STiki tool plays in focusing the attention of the user is most evident by the fact that the tool is used as a separate interface from the Wikipedia platform. To use STiki, one must first download an executable file that runs as a program on a desktop computer. After running the program, a user must enter their Wikipedia log-in credentials in order to access the

functionalities of STiki. From there, a user is immediately presented with a “diff,” two screens of text where the screen on the right displays an edit that the algorithm has detected as being questionable, and the screen on the left displays the prior version of the edit. After reviewing the diff, the interface provides a user with four possible actions for the diff in question: classifying the diff as vandalism which will undo the edit, classifying the diff as a good faith mistake which will undo the edit, classifying the edit as innocent, or not classifying the diff. The separate editing interface of the STiki program acts as a central place where attention is drawn to a diff and instructions are given to review the diff with options to select for further action.

The STiki tool also defined the pace of their editing session around the appearance of the diffs in the interface. Nancy described her experience using STiki as one of constant movement, where there was a sense that there was always more to be done. Furthermore, the solitary nature of using STiki, where the user is responding to instructions from the STiki tool and not collaborating with other users, speaks to the way in which the tool is a central focal point of the user experience, preventing distractions from any other aspect of editing on the Wikipedia platform.

Similar to the description of how the STiki tool positions Nancy in relationship to the authority of the developers and corpus of edits, the examples of Maria, Roger, Janice, and Lawrence in Planet Hunters suggest a similar dynamic that performs authority-subject presence. In these examples, authority-subject presence is performed in the way the that attention of users is directed to the instructions that appear via the classification interface and the pace of their activity is determined by the delivery of these instructions and tasks. The primary task in Planet Hunters is to classify images using the classification interface. While

volunteers can leave comments on the Talk space, my interviews with newcomers revealed that their participation occurred almost exclusively on the classification interface. Statements by volunteers like Janice and Roger, suggesting that their primary purpose in the project is to sort through the large data set points, show how the classification interface captures and focuses the attention of volunteers, drawing them toward the directives and needs of the scientists. In my participation as a newcomer to Planet Hunters, I find that the first action that a user is allowed to do on Planet Hunters is to engage the tutorial and begin classifying. This example demonstrates how the scientists and designers have created an experience for users that draws them toward a space in the project that focuses their attention on directives from the scientists.

Two distinct and persistent regions are performed in the way the STiki tool concentrates the attention of users in one place, creating a distinct “here” and “there,” where the users of STiki occupy one region and the STiki developers and accompanying actors occupy another. The region of the Stiki tool, like the teacher and the blackboard, directs users to what they should pay attention to and how to do the work. The persistence of this separate authoritative region occupied by the STiki tool is defined by a relational configuration of actors comprised of the developers of the STiki tool, the corpus of edits selected to train STiki, the edit scoring algorithm, a group of editors that approve the development of automated and semi-automated tools, and the accompanying policy page on bot use and development. This configuration of actors all play a part in stabilizing the authoritative region of the STiki tool and contribute to its persistence.

In Planet Hunters, distinct and persistent regions of participation separate volunteers from scientists, with the scientists acting as the authority that subjects the volunteers to their needs. In the same way that predictable outcomes of volunteer practice are perpetuated through an alliance between learning resources authored by scientists, the zoom tool, and the classification interface, distinct and persistent regions are performed when volunteers only use resources or do tasks that have been sanctioned and designed by the science team and developers. The distinction for regions of practice between scientists and volunteers is further defined by the fact that volunteers, with rare exception, cannot travel to the physical space where the scientists and developers exist and interact with them in hopes of influencing project practice.

The third way in which authority-subject presence is performed is how STiki creates predictable outcomes of user contribution through the restriction of activity and use of immutable objects. As previously described, STiki is software that runs outside of the Wikipedia platform, providing a unique interface designed specifically for reviewing diffs that have been scored by the STiki algorithm as being potential vandalism. The interface designed specifically for one task and the content displayed in the interface that adheres to the logic of an algorithm based on a corpus of edits points to the ways in which the work of a STiki user is restricted not only to the action of viewing diffs, but also to viewing diffs that adhere to an established logic of what counts as acceptable content on Wikipedia. In the same way that the teacher in Sørensen establishes an alliance with the immutable textbooks so that she can restrict and predict the activity of students, the developers create an alliance between the algorithm, edit corpus, and the diff browser to restrict and predict what the editors will do. Two other sets of

immutable objects that also play a part in the alliance created by the developers include the four options that editors can choose from when classifying edits and the templates for leaving feedback.

Similarly, authority-subject presence is also performed on Planet Hunters with the design of the platform that restricts what activities users engage in, how they engage in them, and the resources available to users for learning how to contribute. First, as previously mentioned, the classification interface is the primary space where newcomers contribute to the project, and the range of activities offered to users is limited to what the science team determines. The zoom tool, used for analyzing light curves, is designed to constrain how users observe light curves based on prescriptions determined by the science team. By creating an alliance between the classification interface and zoom tool, the science team and project designers create conditions that restrict the activity of users, ensuring that users will participate in the project in a predictable way, one that aligns with the goals and desires of the scientists. In producing this immutable region of participation, the science team is able to make scientific knowledge claims as they turn the citizens' work into scientific articles.

The difference between the two cases emerges around the unique characteristic of authority-subject presence in the Wikipedia case. To describe Nancy merely as a subject to the authority of the STiki's tool leaves out the complicated nature of Nancy's agency in this practice. While she is operating within and made subject to a well-defined region of practice, Nancy is simultaneously making vandals subject to the authority she performs with STiki when she decides to revert an edit. Whenever Nancy leaves a message on an offending user's talk page, it is her name that appears at the end of the message, positioning her as an authority that

subjugates the vandal by both flushing out the vandal's edits and reminding the vandal that their work has been identified as incongruous to community standards. Indeed, as previous research has noted, such semi-automated vandalism identification processes "situate users as police, not mentors, affording rejection and punishment" (Halfaker et al., 2014, p. 1). While I observed Nancy's use of STiki as performing a simultaneous position of authority and subject, research on the effect of semi-automated tools on article quality suggests that there are moments when this dual position can be erased and the presence of a human user becomes nearly irrelevant. Recent research has shown that the decline of new editor retention on Wikipedia is correlated with the introduction of vandal-fighting tools (Halfaker, Geiger, Morgan, & Riedl, 2013a). As Halfaker et al. find, antivandalism tools have been associated with the reversion of desirable newcomers' work and with editors who in good faith made edits that did not align with community standards. This finding demonstrates that vandal-fighting tools can be used indiscriminately, where the needed nuance of human judgment is left out of the process when the user relies only on the judgment of the algorithm.

While both the STiki example in the Wikipedia case and the example of the classification interface and contribution processing mechanisms describe a well-defined place for human input on the platforms, the dual position of authority in the STiki example suggests a unique relational characteristic that we do not see on Planet Hunters. In the case of STiki, Nancy becoming subject to the algorithmically defined practice of vandal fighting can, based on the degree of attention she gives to the task, make her an authority over other users on the platform, while the use of the classification interface locks in the newcomer into a position of being a subject, with no relational flexibility in this position.

5.1.2 Performing Traces of Participation

Theories of newcomer learning in open online settings point to newcomers observing the traces of other participants work as an integral part of learning the norms of practice (Bryant et al., 2005; Mugar et al., 2014; Preece & Schneiderman, 2009). While this theme did emerge in my data, I also identified how observing traces of participation leads to imitation as a way of demonstrating competence and adherence to standards of community practice. In this example I build on existing findings about the importance of observation and unpack how newcomers incorporate public traces of participation in their practice and the ways this demonstrates adherence to standards of practice.

Daniel was motivated to contribute to Wikipedia after he received a collection of memorabilia that belonged to his grandfather. The memorabilia contained pictures, notes, and medals that painted a picture of his grandfather's time as a crew member aboard a United States Navy ship during World War II. Daniel described to me that while looking through the artifacts, he would look for articles on Wikipedia so that he could learn more about the context of his grandfather's time in the war. While using Wikipedia to learn more about the war, he found that, among the many articles about specific US Navy ships throughout US military history, there was no article about the Navy ship that his grandfather was on. Daniel saw this gap as an opportunity to make a contribution.

Daniel described his experience of learning how to edit as one of copying the broader structure of other articles that were similar to his topic as well as copying and pasting specific syntax to reproduce specific formatting features, like an info box (See Figure 5.4).

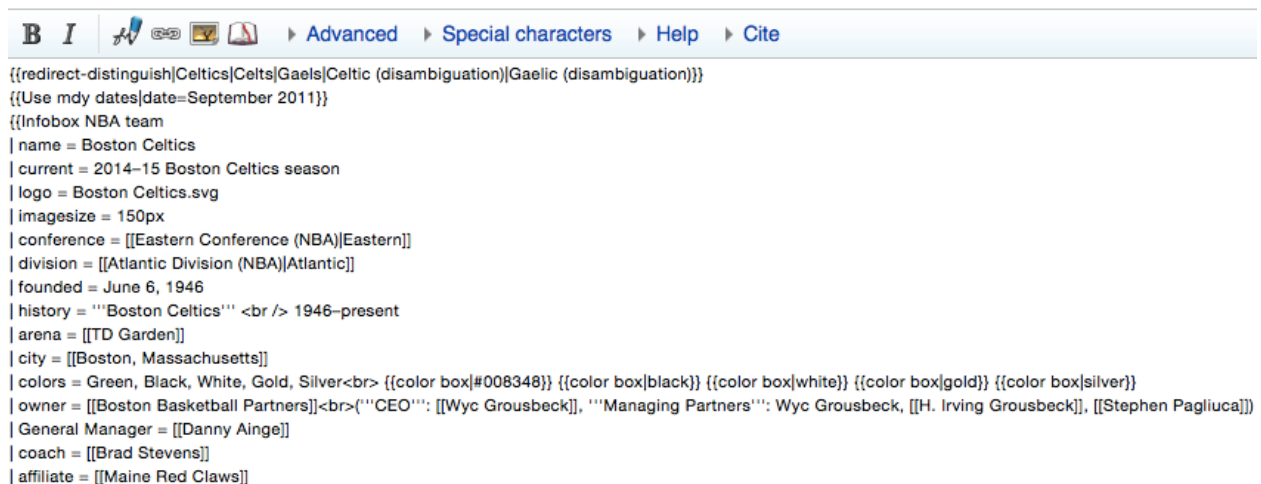
What would happen is I'd work along until I realized that I had a problem...I actually just stole a lot of the structure by going to other people's articles and copying what they did, or copying their structure. For example, the whole infobox and all the information on the ship is lifted from another form and then pasted in and then I changed it.

(Interview with Daniel, March 3rd 2015)


Richard, also a newcomer writing an article on the topic of military history, told me that he cut, copied, and pasted his way through learning how to participate.

One of the great things about Wikipedia is being able to look at the source page of any article, and like any good technologist, I cut copy and paste my way, initially to get through the process and get my head around the process. That was really instrumental in my being able to understand what they were looking for...I would do this with articles that were similar to the one I was working on.

(Interview with Richard, October 20th 2014)



```

B I  Advanced Special characters Help Cite
{{redirect-distinguish|Celtics|Celts|Gaels|Celtic (disambiguation)|Gaelic (disambiguation)}}
{{Use mdy dates|date=September 2011}}
{{Infobox NBA team
| name = Boston Celtics
| current = 2014–15 Boston Celtics season
| logo = Boston Celtics.svg
| imagesize = 150px
| conference = [[Eastern Conference (NBA)|Eastern]]
| division = [[Atlantic Division (NBA)|Atlantic]]
| founded = June 6, 1946
| history = '''Boston Celtics''' <br /> 1946–present
| arena = [[TD Garden]]
| city = [[Boston, Massachusetts]]
| colors = Green, Black, White, Gold, Silver<br> {{color box|#008348}} {{color box|black}} {{color box|white}} {{color box|gold}} {{color box|silver}}
| owner = [[Boston Basketball Partners]]<br>(''CEO'': [[Wyc Grousbeck]], ''Managing Partners'': Wyc Grousbeck, [[H. Irving Grousbeck]], [[Stephen Pagliuca]])
| General Manager = [[Danny Ainge]]
| coach = [[Brad Stevens]]
| affiliate = [[Maine Red Claws]]

```

Figure 5.4 Example of syntax formatting for an info box

For both Richard and Daniel, their experience with contribution was one met with little resistance from other editors. This lack of resistance from other users is evidenced by observing the edit summary for both where, for example, of the 653 edits Daniel has made in the article space, zero have been deleted. Similarly, for Richard, of the 282 edits he made in the article space, zero have been reverted. This statistic is a good indicator that their contributions align

with the standards of practice for two reasons: first, not having any edits reverted is used as a metric by researchers at the Wikimedia Foundation to measure the quality of newcomer edits¹⁰, and second, their work in the topic of military history is one of the most popular topic areas on Wikipedia, with over 800 featured articles, over 3,000 project members active on the project page that monitors the status of article development (nearly three times the size of the second largest project)¹¹ and a manual of style that is unique to articles on military history. In such a setting where the dimensions of practice are well defined and the topic receives a lot of attention, work must demonstrate its alignment with the standards of practice through the use of what Ford describes as alliances of coded objects (Ford, 2015). Ford describes how an article on Wikipedia is aligned with the standards of work by an assemblage of objects like citations, images, graphs, and infoboxes, all acting as allies in defending against editors who wish to question the quality and value of the article (Ford, 2015). However, objects like info boxes or the use of graphs and images can vary in their instantiation depending on the subcommunity in question, therefore the actions of copying and pasting syntax and imitating article structure by Daniel and Richard reflects a move that replicates the standards of the military history community, aligning Daniel and Richard's practice with established approaches to article editing for their specific topic.

Copying Competence

Performing traces of participation as a dimension of inclusion bears a strong similarity to the accounts of newcomer learning by observing other participants on participatory platforms

¹⁰https://meta.wikimedia.org/w/index.php?title=Research:Productive_new_editor&oldid=8184667

¹¹https://en.wikipedia.org/w/index.php?title=Wikipedia:WikiProject_Directory/History_and_society_WikiProjects&oldid=699690148

(Bryant et al., 2005; Nonnecke & Preece, 2000; Preece et al., 2004; Sun, Rau, & Ma, 2014). The primary distinction, however, is in the act of how newcomers go about applying what they learn and the way in which standards of practice are preserved in this act. In performing traces of participation, the agency of newcomers is at once defined by their drive to learn how to contribute on their own terms and do their own work, while also being constrained and limited by the authority of experts imbued in the artifacts of templates that the newcomers use in their work. Therefore, the construction of newcomer agency in the example of performing traces of participation is both a form of agent-centered presence and authority-subject presence, with newcomers engaging in a self-guided journey of learning, drawing on the work of others to drive their own work, while also finding themselves constrained by well-defined regions of participation when applying the templates to their work.

As an example of agent-centered presence, the power relations observed in the act of copying and pasting code on Wikipedia is defined by the fact that the newcomer is not being directed by an outside authority to engage in this act. The newcomer is allowed to copy and paste the code and they do it of their own volition. Similar to the descriptions of individually driven approaches to learning on participatory platforms, copying and pasting code is akin to learning by observing, with the newcomer seeking out their own resources for learning without anyone directing their attention to anything in particular. Furthermore, agent-centered presence is evidenced in the way that the authority of the code used by the newcomer is procedural, where the previous steps that led to the creation of code influence the subsequent steps taken by the newcomer. By copying and pasting the existing code, the newcomer is contributing to authority that exists through the aggregation of steps, where one person's use

of the template influences the next persons use, without any one person demanding the use of the template.

The act of copying and pasting also exhibits characteristics of a newcomer being subject to an authority. While the newcomer is not directed by anyone to copy and paste existing code, the act of learning through copying and pasting is an act of imitation, where knowledge, in the case of the above examples, exists within the stabilized region of standards on military history articles, perpetuating and further stabilizing the homogeneity of articles on military history through the act of imitating and deploying approved templates. By copying and pasting this approved syntax, Richard and Daniel make themselves subject to the authority of a region of experts who define and maintain the syntax, creating two distinct regions of participation, one, the experts, and one, those who make themselves subject to their decisions. By imitating and applying the knowledge of the expert region of work to their contributions, Richard, Daniel, and other newcomers like them constrain their actions so as to align their contributions with standards of practice, making their work a valued and accepted addition to Wikipedia.

The dual forms of presence performed in the act of copying and pasting existing syntax is a valuable example of how the individually driven newcomer experience can also be reconciled with moments of operating within well-defined regions of practice that work to perpetuate and stabilize standards of work. While a newcomer is performing agent-centered presence by defining how they are learning to contribute, such moments of learning can also perform authority-subject presence through the act of imitation, where their agency is constrained, aligning their actions so that they do not upset the standards of doing work on the platform.

5.1.3 Summary of Inclusion

The theme of inclusion elucidates how the alignment of newcomer contributions with standards of community practice is performed by their relationship with experts or experienced members. Drawing on Sørensen's forms of presence, the theme proposes two dimensions that describe distinct relational characteristics that perform inclusion: automated bounding of practice and performing traces of participation.

In the dimension of automated bounding, newcomers are positioned as subjects to experts that provide tasks that are deemed as valuable to the community, with options to complete the tasks that are also aligned with standards of how these tasks should be executed. While in each case newcomers encounter the respective tools in different ways, the effect of positioning the newcomer in relationship to experts that define both the needs of a project and the actions for meeting those needs remains the same.

Like automated bounding of practice, the dimension of performing traces of participation examines how a newcomer's practice is aligned to a standard of practice by their relationship to the work of other volunteers. Unlike automated bounding of practice, performing traces of participation is also an example of agent-centered presence, where the newcomer's decision to draw on the previous work of other editors is not driven by an outside authority, and therefore reflects an individualized approach to newcomer learning. Performing traces of participation is, therefore, at once authority-subject presence, with the work of a newcomer being bound up by standards of practice, and agent-centered presence, with the decision to engage in this action being determined wholly by the newcomer. This act of copying and pasting is similar to actions taken by programmers who copy and paste code frameworks

and make modifications rather than learn how to write the code from scratch (Brandt, Guo, Lewenstein, Klemmer, & Dontcheva, n.d.). In copying and pasting established frameworks, a newcomer ensures that their code is aligned with existing standards of coding, an act similar to what has been described as “writing up” in Wikipedia (Ford & Geiger, 2012), where the content of an article must adhere to specific organizational processes. By copying and pasting formatting syntax on Wikipedia, the newcomers are adhering to and aligning their work with standard of practice.

When comparing the cases around the theme of inclusion, authority-subject presence is evident in both, however the prominence of this form of relationship throughout the newcomer experience is different between the two cases. For Planet Hunters, authority-subject presence defines the entirety of the newcomer experience, with the primary mode of contribution taking place through the classification interface where users must respond to instructions and review reference material written by the scientists. By contrast, newcomers to Wikipedia only find themselves in authority-subject relationships at particular junctures in their experience, for example when they choose to use a semi-automated editing tool, or, as described in the previous chapter, are made subject to the feedback of an experienced Wikipedian.

5.2 Exclusion

Newcomers often face barriers to participation where they are unable to make contributions to a project, with their work being rejected or their membership in particular spaces being challenged. In this theme, I describe examples where newcomers find their work being rejected by other members or engage in a self-imposed exile to avoid negative interaction with more

expert members of the platform. In describing the experience of being excluded from participation, this theme examines the relational characteristics that define what it means to have one's work rejected or avoid certain spaces of participation, emphasizing in particular the positionality of the newcomer in relationship to other actors in these moments of exclusion.

In this theme, I examine two dimensions of exclusion: evading authority and avoiding authority. In evading authority, I describe the condition of participation in the margins, where newcomers go to work on their contributions after it has been rejected. In this dimension of exclusion, I emphasize the relational characteristics of the newcomer to a configuration of actors aligned to enforce a particular standard to practice on the platform, and the ways that participation in the margins exists as a space in contrast to where standards are enforced. In these margins of participation, I describe how newcomers are given an opportunity to renegotiate their approach to participation, exploring how they can align themselves with dominant standards of practice or, in some cases, deviate from these norms and challenge them. In the dimension of avoiding authority, I describe how some newcomers operate outside of the spaces of participation in projects on a self-imposed exile so as to avoid the scorn of more experienced participants who the newcomers believe will not approve of their contributions.

Overall, this theme highlights the agency of newcomers when they find themselves out of sync with the standards of practice, emphasizing exclusion as being performed relationally, positioning the newcomer away from the project, and forcing them to reflect on their position and negotiate a new path forward.

5.2.1 Practice in the Margins: Evading Authority in Wikipedia

Creating a new article or making edits to a well-established article on Wikipedia can be a difficult proposition, especially for a newcomer. While there are low barriers to making an edit to an article, the policy of notability as well as debates around what constitute valuable sources define what content will stick to an article (Ford, 2015), in turn frustrating a newcomer's attempts at making changes to or creating a new article. As stated previously, the famous tagline for Wikipedia, "the encyclopedia that anyone can edit" has been revised by researchers to "the encyclopedia that anyone who understands the norms, socializes himself or herself, dodges the impersonal wall of semi-automated rejection, and still wants to voluntarily contribute his or her time and energy can edit" (Halfaker, Geiger, Morgan, & Riedl, 2013a). As is the case for many newcomers, contending with this frustrating barrier of participation involves having one's contributions rejected, which in some cases results in newcomers leaving the project altogether, sometimes returning to make quality edits that align with the norms of practice (Halfaker et al., 2011) or challenge the existing practice of editing. Through my observations and interviews I describe how the latter two conditions occurred, focusing on how these rejections were performed and where newcomers "go" after their contributions have been challenged.

Brianne is a new editor on Wikipedia. She is a lawyer by training and a volunteer transcriber of historical texts for a major global historical institution. As a transcriber for the historical institution, Brianne is given many projects about women in the early 1900s. Fascinated by the text she transcribes, Brianne often goes to Wikipedia to learn more about the topics of the text she is transcribing. Often, she finds that many of the noteworthy women

whose stories she transcribes have no representation on Wikipedia. Annoyed at what is a broadly acknowledged systemic bias on Wikipedia that produces a gender representation gap in articles (Jemielniak, 2016), Brianne has taken matters into her own hands and creates articles on Wikipedia about the female historical figures she comes across in her transcription work.

When she decided to create her first article, Brianne came upon the Articles for Creation (AfC) space, a project on Wikipedia where users can submit drafts of their article for review by other Wikipedians. Like Brianne, many registered and all unregistered Wikipedians looking to create a new article come to AfC after successfully completing the article creation wizard, a decision tree feature that asks a series of questions about the characteristics of the proposed article to determine whether or not it fits within the standards of new article creation. For Brianne, stumbling upon the AfC space seemed like part of the official process of article creation.

It was one of those things where this is if you want to do a new article this is how you do it and I was oh okay. This seems to be a proper process, a proper way to do it and okay if you do everything properly and follow the procedure to do it and then put it up.

(Interview with Brianne, February 17th 2015)

While not explicitly stated on the AfC page, interviews with other newcomers that went through the AfC process suggest that the primary measure of an article that passes through AfC reviewers is one that meets the notability criteria, or an article that has a sufficient number of citations from reputable sources. The heavy bias toward notability has led some to describe AfC as lacking nuance and, as one long time editor and administrator described to me, as being a bastion of “petty bureaucrats drunk on power.”

With regards to women scientists you have volunteer petty bureaucrats who are reviewing these articles and they see themselves as the gate keepers and the protectors

that are drunk off the power they have been allotted and this just reinforces this systemic bias.

(Interview with Kelly, September 11th 2015)

It is this focus on the notability policy that made Brianne's initial foray into article writing difficult. The first article that Brianne decided to work on was of a female botanist who had three plants named after her. When she first submitted the article, she had only a few citations and as a result, the article was denied publication in the article space of Wikipedia. Brianne described to me that working on articles about early women scientists is very frustrating because there are few citations for her to draw on. Indeed, research shows that due to overwhelming systemic obstacles, women publish far less than their male counterparts in science (Etzkowitz, Fuchs, Gupta, Kemelgor, & Ranga, 2008) . Given the limited amount of published work and the notability policy for articles on Wikipedia, a strong systemic bias is performed against the representation of women in science on Wikipedia, one that Brianne experienced firsthand. Reflecting on her experience with AfC, Brianne realizes that her article topic was incompatible.

But I chose the wrong subject for that particular process because the person I chose is very obscure...I mean classic 1900's notable woman, who's circumstances are against her and still manages to contribute to society and science and comes up against the notable and so that's the area I was working in...[I] feel like I can't back out the notability side of things in the traditional way because there's references, but there's not a whole heap of them, but she is notable. She's got three bloody plants named after her, what more do you need, and it's because all of that, the area I'm working in isn't conducive to guys looking at the article going is this woman notable."

(Interview with Brianne, February 17th 2015)

It was not until Brianne attended a workshop on editing articles on Wikipedia that she learned she was not beholden to the AfC process. At the workshop, she expressed her frustration to the workshop facilitator who explained how she could create an article outside of

the AfC review process. Now Brianne works on her articles outside of the AfC process, avoiding the reviewers that uphold a narrow understanding of notability. Brianne's work outside of AfC involves writing as much of the article as she can on paper and then transferring the article to her sandbox, a feature on Wikipedia tied to a user's account that is recognized by the community as a space where a user can make any edit they wish without input from another user.

The way I use the Sandbox is I tend to do the research and sort of get a general idea of what I want it to actually look like on a piece of paper with bits floating around everywhere and I go to my Sandbox and I get it organized in my Sandbox so it looks 100% correct and check everything, make sure I've got references, make sure it's all linked to as much as I can and then when it's right, that's finished and then put it immediately into Wikipedia, I do not go through people who review it."

(Interview with Brianne, February 17th 2015)

By writing and researching offline, developing the article in the sandbox, and avoiding the AfC review process altogether, Brianne evades the authoritative gaze of experts, positioning herself away from the spaces of the project where standards of practice are actively enforced. By positioning herself on the margins of Wikipedia, outside of where standards are enforced, Brianne develops and strengthens her article so that it can eventually defend itself against the challenges that will emerge once the gaze of experts inevitably lands on her work.

From Authority-Subject to Agent-Centered Presence

The act of having her work rejected by the reviewer performs authority-subject presence. Here, we see Brianne receive a message that indicates her work has not been accepted by the reviewers, whose task it is to uphold article standards in accordance to stated policy on Wikipedia. In the rejection of her work, a distinct and homogeneous region of practice is established, with Brianne's work standing out as an exception to this homogeneity of practice.

This region is performed by reviewers who draw on the immutable objects like the notability policy in order to perpetuate predictable editing activity. As Sørensen describes in her definition of regions, “If one is inside a region and does not fit the definition of the regional identity, then one is performed as an exception, or as belonging to the sub-region of deviance” (Sørensen, 2009, p. 98). Indeed, by being rejected, she is cast out of the region of practice performed by AfC reviewers.

When Brianne decides to work on her article outside of AfC, we see her move to, as Sørensen describes in the latter part of the previous quote, a “sub-region of deviance.” This subregion of deviance is what we can describe as the margin of practice, where, like the students in Sørensen’s classroom that participate in the online virtual world unencumbered by and out of sight of the teacher’s authoritative gaze, Brianne operates outside of a well-defined space of practice, writing the articles the way she wants to. By avoiding the AfC review process, writing her articles offline and using the sandbox feature, Brianne creates a buffer between her work and a space where the standards of editing on Wikipedia are reified into a process and enforced in a relentless manner, performing a clear region of what standard practice is and is not. By avoiding the authoritative gaze of the review process, Brianne works in the margins of Wikipedia, a space where the enforcement of article standards is not upheld as a process as it is in AfC. By participating in the margins, we observe both the performance of authority-subject presence and agent-centered presence, where she is at once excluded from standard project practice but also continues to contribute on her own terms.

By writing what she wants to write, Brianne also challenges the standards of practice of Wikipedia, testing the definition of notability and leading the charge by establishing her own

authority, redefining notability in the context of women in science. By being cast out to a subregion of deviance, Brianne performs agent-centered presence, responding only to her interests and not focusing on any authority that exists in a distinct and well-defined region of practice. Building on the idea of agent-centered presence and operating in a space where there is no singular authority, the idea of practice in the margins represents work in an “uncontrolled” territory of the project where the standards of project practice are not easily enforced. The margins of practice can be thought of in the context of a normal distribution curve in statistics, where one or two standard deviations from the mean in either direction reflects articles and project spaces that receive the majority of attention and energy to support normative practice. However, if one looks three standard deviations out in either direction from the mean, they will find the margins of practice, where little attention is given and in turn, opportunities for experimentation and resistance to standard practice are possible. Indeed, there is a technical difference between practice in the margins if a user is making edits to the article space (subject to edit reversions) or to their sandbox (not subject to edit reversion), but the idea of uncontrolled territory remains, allowing a form of work that can challenge established standards of practice.

While Brianne’s story of challenging the standards of practice does not represent all of the interviews I conducted, it does provide insight to the broader phenomenon of the margins of participation on Wikipedia. Many of the newcomers I interviewed retreated to their sandbox after having their work rejected, followed the feedback they received about how to improve their work, and returned to the article space abiding by the dominant norms of practice. In other cases, I interviewed newcomers who, after retreating to their sandbox, were unable to

figure out how to get any of their work accepted, resulting in their articles existing in the limbo space of their sandbox.

Newcomers facing barriers to participation, such as having their work reverted or receiving negative feedback, is well documented in existing research. What this theme of practice in the margins describes is how newcomers negotiate authority-subject presence when they are being excluded from the project and subsequently perform agent-centered presence when they go to reframe their approach to work. Furthermore, this theme of practice in the margins shows how being pushed away from practice can create opportunities for challenging the established modes of practice. In showing this, the idea of margins of participation also demonstrates how participatory platforms afford opportunities for practice that deviate from the norm, even if the practice of the platform is well defined.

5.2.2 Avoiding the Scorn of Experts in Planet Hunters

Maria, who we met earlier in the chapter, is a moderator on many Zooniverse projects and has over 12,000 annotations on Planet Hunters, yet she has only made six comments in the talk forum. The contrast between annotations and comments stood out to me after having examined eight accounts of editors who had over 4,000 annotations, with all, except for Maria, having well over 100 comments. When I asked her about why she has made so few comments, she described an experience where she attempted to engage some more experienced users, only to find herself on the receiving end of some discouraging feedback, with more experienced users telling her she needed to go back to the tutorial before she asked questions in talk.

One of the reasons that I don't participate in Talk is because the people who participate on Talk are specialists and are very competitive and patronizing. There have been some instances where people ask a question and the answers are not very nice from some of the specialists.

(Interview with Maria, November 3rd 2014)

While they were not on the receiving end of discouraging feedback from other users, other newcomers to Planet Hunters described feeling a sense of inadequacy that kept them from making user-generated annotations or sharing user-generated analyses in the talk or discussion features. For example, one newcomer pointed out that after seeing the social spaces of Planet Hunters, they felt that they had nothing to contribute because the conversations appeared to discuss topics that he was not knowledgeable about.

I've seen some discussions that I've seen here and there but nothing that I felt I could really participate in. Some people, I don't know were talking about, I don't even remember what they were talking about they were using highly technical vocabulary.

(Interview with Nathan, July 30th 2013)

Another newcomer described how it was a question of not having enough experience with the primary project task of annotation that made them feel like they were not equipped to contribute to the social spaces of the project.

I don't have experience enough in it with the images to feel like I have anything to contribute to a conversation about them.

(Interview with Patricia, May 11th 2014)

This feeling of inadequacy in regard to contributing to the talk or discussion feature was not unique to newcomers. Expert members indicated that, while they leave comments about what they observed, they do not engage in some of the higher level analysis because they do not feel like they have an adequate grasp of the processes and tools involved in this form of work. For example, Carl, a lifelong amateur astronomer and longtime contributor to Planet Hunters, will sometimes use an offsite tool to calculate the diameter of potential planets,

however he points out that he leaves the more complex analytical work that involves spreadsheets and other tools to the small group of “super users.”

I don't do my own number crunching though, I wouldn't know how to download the data. I tried it once, to try to download the excel files but haven't had any luck in that, so there are certainly limits to what I am able to do scientifically, I leave it to those guys to do that.

(Interview with Carl, March 6th 2013)

Like Carl, another experienced member pointed to a technical barrier that keeps her from engaging in higher level analysis, mentioning that she is trying to learn Bayesian modeling using the Python scripting language, but that she has a long way to go before she feels confident.

Co-Creating the Limits of Participation

By avoiding particular spaces of the project, the negative feedback that Maria experienced or the sense of inadequacy felt by Nathan manage their movement and participation in the project, restricting their contributions to specific spaces on the platform. Such restriction of actions as it is related to Maria and Nathan's direct and indirect encounters with experts performs authority-subject presence, with the experts making the newcomers subject to restrictions that the experts impose on the newcomers. Such limitations and the sense of being subject to their authority is a mutually constituted phenomenon, where the newcomers recognize their place in the project in relationship to the place and purpose of the experts. For Maria, Nathan, and other newcomers to the project, the space where they feel equipped to participate is the classification interface, where, as Maria and other participants point out, they have a sense of purpose and a well-defined understanding of their relationship to the technology and goals of and the scientists in the project. The talk and discussion spaces, on the

other hand, appear inaccessible, with complex language and unfriendly contributors making the opportunity to contribute difficult. This barrier of social and technical hurdles works to manage the movement of the newcomers, limiting their participation to certain places of the platform until, as other participants described, they believe they are ready to contribute. In acknowledging this relationship to expert participants, definitive boundaries of participation emerge, where two distinct regions of participation reflecting expert and newcomer practice are reinforced.

The performance of authority-subject presence and the distinct boundaries of participation limits the movements of newcomers in such a way that both contributes to the homogeneity of practice in expert spaces of participation and isolates newcomers from particular spaces until they have the knowledge and skills required to participate. By limiting movement to particular spaces, the co-created limitations of participation promote the homogeneity of practice in expert spaces in such a way that newcomers want to make sure that their contributions are aligned with the existing practices of high level analysis and scientific vocabulary being used. For example, Maria being told that she should return to the tutorial before she asks questions in the talk space reflects an enforcement of boundaries that restrict what expert contributors want the practice of the talk space to be. By sending Maria back to the tutorial, a “here” and “there” is performed, positioning Maria in relationship to the experts, defining what she must do in order to cross over from her region of newcomer practice into the region of expert practice.

While these co-created limitations of participation are to some extent self-imposed, they are important to recognize as emergent newcomer management tactics that shape their

experience. While the above examples do not suggest an official tactic deployed by leaders or experts, the reinforcement of positions in specific spaces of participation between newcomers and experts is a tactic that takes place across many participatory platforms and appears as an integral, albeit informal, approach to managing and defining the agency of newcomers.

5.2.3 Summary of Exclusion

Exclusion is performed by the different positions a newcomer occupies in relationship to expert contributors (e.g., AfC reviewers) or project managers (e.g., the science team). Across the themes, being excluded from practice implies being put in a place and a position in relationship to project goals and leaders. Whether it is taking one's work to the margins of Wikipedia or avoiding the talk space on Planet Hunters, the examples of exclusion all suggest moments where a participant is made aware of their subjecthood—what their role in the project is and how to do work. In becoming aware of their subjecthood, exclusion operates like inclusion by making a newcomer aware of the project's standards of practice.

Comparing the cases, the theme of exclusion is performed in different ways. For Wikipedia, exclusion sends newcomers to a limbo zone, like their sandbox or more “remote” regions of Wikipedia where their work may not be observed. Through exclusion, new Wikipedians have the option to continue working on the platform but in the margins where work does not conform to standards of practice. Furthermore, In the case of Wikipedia, exclusion can lead to a breaking of ties with the authority of the project, empowering the newcomer to exert their own agency, performing agent-centered presence as they construct their own experience around learning and participation. By contrast, exclusion for newcomers to Planet Hunters that avoid the social spaces of the project out of fear of receiving negative

feedback end up continuing their work in the classification interface where their contributions are valued.

5.3 Conclusion

The theme of inclusion and exclusion reveals how the contributions of newcomers are defined by the configuration of relations with both human and nonhuman actors. I decipher these different relationships to reveal the characteristics of newcomer agency and how the characteristics of their agency reflect the way in which newcomers negotiate and situate themselves as being aligned or in tension with established configurations of practice.

In the theme of inclusion, I describe how newcomers find themselves positioned as subjects to networks of experts and leaders allied with nonhuman actors like templates in Wikipedia, features in Planet Hunters that frame how a user views the data, or algorithms in Wikipedia that present newcomers with questionable edits to review. In these examples, I observe how a newcomer's work is framed and informed so that their agency is limited to a select number of choices that mostly align with approved modes of contribution. Where the cases diverge however is around the affordances of the platform that allow newcomers to opt out of being subject to the authority of experts. In the case of Planet Hunters, newcomers might only contribute through the classification interface and therefore always find themselves in authority-subject presence, while on Wikipedia, newcomers might only find themselves in authority-subject relationships at particular junctures in their experience, for example when they choose to use a semi-automated editing tool, choose to create an article through AfC, or, as described in the previous chapter, are made subject to the feedback of an experienced Wikipedian.

In the theme of exclusion, I show how newcomer work will be rejected on Wikipedia if it does not incorporate the use of legitimate and required objects and subsequently, how newcomers who are rejected will retreat to operate outside of or on the margins of the platform where they renegotiate their approach to participating, either attempting to align their work with or challenge the standards of practice.

Broadly, this theme reveals that, whether or not a newcomer's initial foray into participating aligns them with standards of practice, being included or excluded from a project does not happen in any singular way, but is a multifaceted phenomenon that is performed at many different junctures of a newcomer's experience. Furthermore, by defining the various ways newcomers are included or excluded from project practice, this theme also brings to the fore the role of nonhuman actors in the newcomer experience. The configurations of relationships, whether they are defined by the characteristics of authority-subject presence or agent-centered presence, all feature nonhuman actors that participate in the performance of these relationships. For example, in the case of copying and pasting as a form of aligning with standards of practice, the artifacts of code that are copied and pasted play an integral role in establishing an authority-subject relationship between newcomers and experts. Similarly, the roles of the vandal detection algorithm and the corpus of edits, both nonhuman actors, help to define homogeneous regions of practice as immutable objects which a newcomer does not have agency to effect change. By highlighting the role of the nonhuman actor in the newcomer experience, this chapter builds on previous research that demonstrates the newcomer experience as an inherently political one, but introduces, too, that the relationships which align a newcomer to project standards are not made with humans alone.

Chapter 6: Managing, Defending, and Negotiating the Periphery of Participation

6.1 Introduction

In the previous two chapters, we met newcomers like Brianne who found herself moving between moments of defining the direction of how to participate and learn and other moments where her options for learning and participation were constrained. For newcomers like Brianne, the oscillation between defining the direction of her learning and moments where learning is defined for her complicates the description of the newcomer experience as having low barriers to participation or as falling along either poles of individualized or institutionalized socialization tactics as defined by Jones (1986). Instead, such examples suggest an experience that reflects a fluidity and hybridity between the poles of socialization while also challenging the idea that participatory platforms have low barriers to participation, pointing to an initial experience that is a bit more challenging and complex.

Motivated by previous research that has also demonstrated how newcomers to participatory platforms contribute in a space that is at once individually defined but institutionally constrained (Geiger et al., 2012; Mugar et al., 2015), the findings from the previous chapters are situated here within what I describe as a taxonomy of encounters, a description of the different ways in which opportunities for contribution and learning are made available at the periphery of participatory platforms. By focusing on encounters with opportunities for participation and learning, this framework articulates the different tactics of managing newcomer participation and the ways in which newcomers negotiate these

constraints on their learning and participation. The proposed taxonomy of encounters offers a detailed discussion of how the poles of institutionalized and individualized socialization tactics converge, and, similarly, how themes from existing online socialization overlap, pushing beyond a snapshot perspective of the newcomer experience and revealing instead a longitudinal account that shows how platforms balance low barriers to participation with punctuated moments where newcomers are made subject to the authority of platform leaders and experts. By exploring this taxonomy of encounters, I also describe how, by refining our understanding of what the conditions of participation look like on periphery of participatory platforms, this framework contributes to a growing conversation about conceptualizations of openness and participation in digital contexts and how these changing definitions can support the design and management of the periphery of participatory platforms.

6.2 A Taxonomy of Encounters

The framework describes a taxonomy of encounters (see Figure 6.1), where the term “encounter” is meant to encapsulate both the conditions of the newcomer experience that experts and leaders create at the periphery of participation and how newcomers negotiate these conditions. These encounters reflect the findings from the previous chapters, drawing on the different points of entry as the conditions of peripheral participation defined by experts, and leaders and the moments of inclusion and exclusion as the act of negotiating these conditions and one’s participation in the project. The taxonomy consists of self-guided, targeted, and guided encounters, as well as how newcomers negotiate these experiences toward being included or excluded from contributing to a project.

The two cases in this research, a mature peer production platform and a crowdsourcing platform, reflect two unique but prominent models of activity on participatory platforms (Brabham, 2013). Taken together, they cover a broad range of examples in the phenomena of participatory platforms. In defining the taxonomy of encounters, I describe how the experience of newcomers at the periphery is not defined uniquely by individualized socialization strategies, rather, there are extensive models resembling institutionalized tactics at play that position newcomers into settings where they go through sequential learning models and formalized workflows, and, in some cases, they are removed from the project to learn how to contribute. By unpacking the characteristics of institutionalized socialization tactics as they appear throughout the encounters, I demonstrate the overlap between individualized and institutionalized tactics in the experience of newcomers to participatory platforms and how such overlaps occur in the definition of the encounter in question as well as across the experience of the newcomer, tracking them as they oscillate between moments where they define the direction of their learning and participation and moments where they are subject to the authority of experts. In mapping these conceptual and experiential overlaps, I provide a bridge between existing descriptions of socialization in the literature and the taxonomy of encounters described in this chapter, helping to identify the different approaches that platform experts and leaders deploy to manage the periphery of participation and how newcomers navigate and negotiate such constraints on their experience.

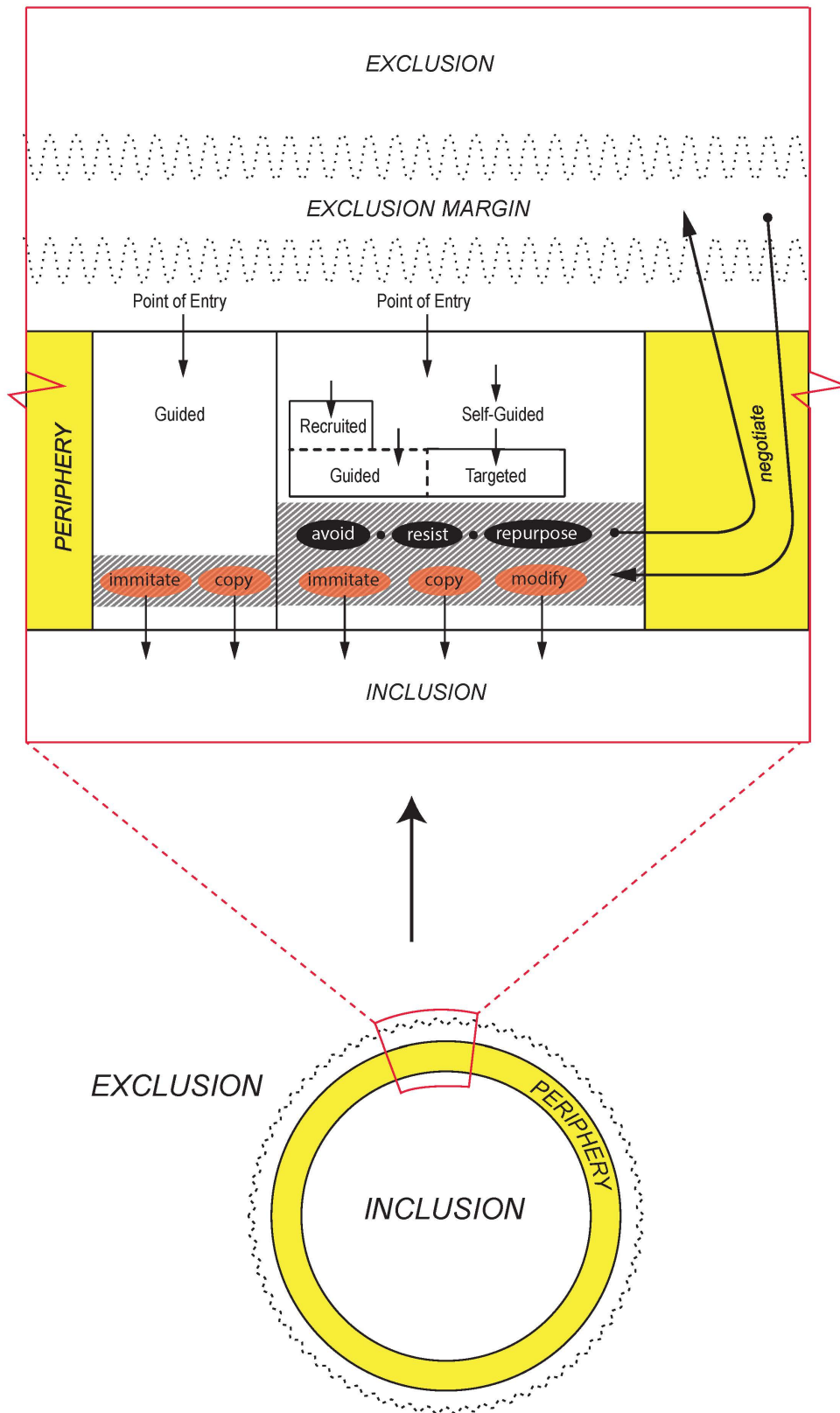


Figure 6.1 Taxonomy of Encounters

While this framework is presented as a comprehensive representation of what I observed in my research, it is not meant to imply that all platforms contain all the encounters described therein, rather it is intended to reflect a range of tactics, with different partitioning of the framework describing the cases in this research and beyond. For example, some platforms may constrain the agency of newcomers from the very beginning, while others may provide more flexibility, capturing the attention of newcomers from one moment to the next but not throughout the entirety of their experience.

6.2.1 Self-Guided Exploration

Sørensen's definition of agent-centered presence suggests a form of learning where a person is guided by their own interests with no external pressure shaping the participation. As Mugar et al. (2015) suggest, newcomer learning on platforms like Planet Hunters is situated within the broader realm of their personal interests and that newcomers actively draw on resources that are external to the platform to make sense of what they do on the platform. This picture of self-guided exploration is, of course, fundamental in seminal work to descriptions of newcomers to participatory platforms that emphasize the importance of having access to observe practice, describing initial participation as a phase of exploration and sense-making where newcomers examine what other participants are doing and read up on existing policy (Antin & Cheshire, 2010; Bryant et al., 2005; Preece & Schneiderman, 2009). Similarly, the findings from my research suggest that much of the experience of learning and participation at the periphery is situated within a self-guided experience, where newcomers begin by exploring their new

environment, testing out participation, and encountering obstacles that drive them to use different newcomer support features.

One set of resources, that falls within the definition of self-guided encounters but has not been addressed in existing research, is the role of copying and pasting frameworks of existing content as a way for a newcomer to align their contributions with existing standards. In the findings from the Wikipedia case, newcomers looking to do more complicated formatting work in their article will copy and paste the syntax from a similar article and make the modifications they need to tailor the syntax to their contribution. Described in Chapter 5 as “copying and pasting toward competence,” this example is different from a newcomer observing what someone else does as a way of learning because learning and practice are, while driven by a self-guided practice of learning, bound up by an authoritative region of practice. As I describe in the findings, the newcomers copy the code for an info box used in articles on military history. The code for the info boxes is part of a style guide defined and maintained by experienced Wikipedians who have reached a consensus about what info boxes on military history articles must look like. Therefore, the act of copy and pasting is an act of imitating expert work that, while the newcomers in my research take the initiative to take this action without any outside authority prompting them, places them within a well-defined region of practice that allows for their work to be accepted. While the inclusion of a newcomer’s work through a self-guided experience of copying and pasting syntax does not point to an explicit tactic of managing the activity of newcomers at the periphery of participation, the outcomes casts a new perspective on how newcomers in a self-guided exploration of participation do not

simply observe what others are doing, but rather can, when platforms provide the affordances, imitate work by copying and pasting, producing legitimate and valued contributions.

While the self-guided encounters reflect what Jones (1986) would describe as informal and individual tactics of socialization, with newcomers diving into the work setting and learning on their own, the nature of copying and pasting syntax as a form of learning and participation deserves closer attention in the way that such an act performs a uniform and predictable action. As I described in Chapter 5, copying and pasting existing template syntax ensures that the contribution of the newcomer will be included in a project. Therefore, we see how an individualized approach can have the outcomes of collective and formal approaches to socialization, where the newcomers produce uniform and predictable responses to particular scenarios. The template of syntax in this particular example case reflects the consensus of experts about how they want the information boxes in articles about military history to look. Therefore, by copying and pasting the template, the newcomer is deploying a response to the situation of what an infobox needs to look like that is aligned with the institutionalized approach to doing the work. Learning by copying and pasting reflects a hybrid moment where individualized learning encounters opportunities for participation that will ensure institutional alignment, showing how the individualized experience can often operate within well-defined boundaries of practice.

6.2.2 Guided Encounters

While a newcomer's learning experience is often guided by their own direction and motivation, platform experts and leaders in mature peer production and crowdsourcing projects actively

deploy tactics that shape how newcomers learn about and contribute to a project. Guided tactics that inform the newcomer experience may include tutorials, spaces where newcomers can ask questions of experts, or processes where newcomer work is removed from the main project and reviewed before it is accepted as a contribution. All of these examples reflect explicit attempts by project leaders and experts to guide newcomers toward positions of being subject to an authority so that their work can be aligned with the standards and goals of a project. Indeed, these examples also reflect a departure from the seemingly laissez-faire perspective of newcomers figuring out participation on their own by observing existing work and sorting through countless policy and guideline documents. Guided encounters are described here by describing first the pathways that lead newcomers to finding themselves in such a setting and second, the different tactics of guided encounters used to align newcomers with project standards as well as how some newcomers attempt to resist being guided.

Pathways to a Guided Encounter

The findings reveal that experts and leaders of participatory platforms use two explicit strategies to draw newcomers into guided encounters with project participation: *total guide* and *recruit to guide*. Outside of explicit strategies used by platform experts and leaders, newcomers can come across these guided encounters through their own exploration of the project. Total guide involves a complete control of the periphery, where there is no opportunity for self-guided exploration. Rather, from the very moment the newcomer arrives at the platform, they are immediately situated within a setting where they are told what to do and how to do it. This occurs in two different ways: The first involves the mandatory tutorial and participation interface that appears the moment a newcomer logs in to the site. For example,

loading up Planet Hunters in a web browser immediately places a new user in a tutorial, engaged in a simulated experience of classifying light curves. Another strategy involves an offline approach observed in the case of Wikipedia in the classroom, where the newcomer's first encounter with the platform is defined by directions embedded in a classroom curriculum that articulate how to participate and, in some cases, what to contribute. On the other hand, the recruit to guide strategy is situated within the self-guided newcomer experience, where their initial participation triggers recruitment strategies based on institutional parameters and guidelines for interaction between newcomers and experts. These recruitment triggers deliver messages to the newcomer, enticing them to participate in a controlled setting where they can learn more about the project or get feedback on their work. For example, newcomers to Wikipedia that have engaged in a few constructive edits may receive an invite from Hostbot to participate in the Teahouse, a space where they can ask any questions they want without fear of negative or hurtful responses from more experienced editors. In this case, Hostbot is a part of a group of tactics delegated to the algorithmic infrastructure of Wikipedia designed to corral and capture the attention of promising newcomers, sending them to spaces where they can get valuable feedback to support and promote their valued contributions to the project.

While some support features are discovered through a newcomer's own exploration, findings show that platform experts and leaders actively deploy tactics that make particular support options prominent in the user experience. For example, the Articles for Creation support feature on Wikipedia was described by many of the people I interviewed as an almost mandatory part of the article creation process in the way it appeared in the interface when

creating a new article, even though it is in fact not a required passage point for newcomers that have created a user account.

As the subsequent sections will show, these pathways describe a key component to how platforms draw newcomers into positions of being subject to the authority of experts and leaders. Whether they are design decisions in the interface that emphasize particular options for participation and learning over others, inevitable outcomes where newcomers have no choice, or pathways where newcomers are asked to step away from the project to learn more, each pathway demonstrates explicit attempts to direct newcomer attention toward institutionally sanctioned modes of learning and participation.

Guided Participation

Upon finding themselves situated in a guided participation setting, newcomers may experience different tactics that shape how they learn and participate. A newcomer might find themselves in a setting where learning how to participate is guided, such as a tutorial or a question and answer space. Another setting may work to process and guide participation, delivering instructions on how to do work or processing the contributions of the newcomers so that they fit project goals. Finally, it is important to describe in this framework that in some cases, newcomers may resist guidance and the broader project standards. I speak to the two tactics for shaping learning and participation as well as the description of how newcomers may resist such settings in turn.

Guided Learning

Guided learning describes a strategy where a newcomer moves into a space that is separate from the participation space of the project. In this space a newcomer encounters the same learning material that all newcomers encounter and engages the material in a fixed and sequential manner. For example, the Wikipedia in the classroom initiative provides students with reference sheets on how to edit as well as trainings they are required to complete before they make their first edit. The Wikipedia Adventure moves newcomers into a space where they do simulated editing as part of a curriculum that guides them through learning about different skills and guidelines for participation. Similarly, all newcomers to Planet Hunters engage in a tutorial where they are guided through different steps of a simulated experience of classifying a light curve.

Guided learning strategies are most like institutionalized tactics for newcomer socialization in that they are designed to articulate the standards of participation and give directives around how newcomers should contribute to a project, effectively defining their roles. As Jones (1986) describes, some of the defining characteristics of institutionalized socialization compared to individual socialization include newcomers entering the organization as a cohort, separated from the general population before they participate, and being given a prescribed curriculum by experts. While some examples like the Teahouse (Morgan et al., 2013) and the Wikipedia Adventure (Narayan et al., 2015) do not segregate newcomers before participation, they feature key components of institutionalized socialization in the way they work to create a common learning experience for all newcomers, using a fixed and sequential learning experience or using a mix of collective, and informal tactics, promoting commonly

shared approaches to particular scenarios of participation that encourage newcomers to adopt a standard approach to participation.

While existing research on newcomers to participatory platforms emphasizes the importance of newcomer learning occurring through observation of situated participation or through feedback from expert members, the context for such opportunities is often situated in the wild, or in spaces where a newcomer is participating alongside everyone else. What the description of the guided learning encounter offers to our existing understanding of opportunities for learning is that such access to observation and feedback can be curated and controlled. In the case of Planet Hunters, newcomers are provided with access to the examples of other participants that have been picked by the science team, providing examples of salient situated activity that experts hope newcomers will emulate. Similarly, in settings like the Teahouse on Wikipedia, feedback takes place in a space where a newcomer will be assured of constructive feedback, a guarantee that cannot be made in the wild. Such curated and controlled opportunities for observation and feedback demonstrate how key components of newcomer learning, that are often depicted as being unique to an individualized and situated learning experience at the periphery of a platform, can indeed be managed by experts and leaders, offering newcomers a learning experience that is tied into institutionally approved examples and knowledge of how to be a valuable contributor.

Guided Contributions

In addition to creating a guided learning environment, strategies for managing the periphery also include guiding the contributions of newcomers. These tactics include directing tasks, shaping the task, and processing contributions.

Tactics that direct the task involve providing clear cut directives on what a newcomer will do, such as in the Wikipedia in the classroom initiative where students are given a sequence of goals for how they will develop an article, or on Planet Hunters where each contribution is guided by a sequence of instructions delivered by the classification interface.

Tactics that shape the task frame how a newcomer does work. For example, the zoom tool on the Planet Hunters interface, which has fixed positions for viewing data. These fixed positions are determined by the science team in accordance to standards of practice for analyzing data. On Wikipedia, algorithmically assisted editing tools like STiki act as the eyes and voice of participants, telling them what edits they should pay attention to and giving them template messages for feedback.

Finally, tactics for processing newcomer contributions involve reviewing work and giving directives on next steps or aggregating the contributions of newcomers into a format that is useful to the broader goals of the project. For example, volunteer editors on the Articles for Creation (AfC) project on Wikipedia will take an article written by a newcomer into a draft space, review it, and then decide on whether or not it can be included in the project, while also making recommendations for improvement. On Planet Hunters, the processing of contributions is delegated to the computational function of the platform, where all responses for specific data points are aggregated to create a consensus score. The approach of processing contributions as seen on Planet Hunters does not give a newcomer any agency in revisiting their contribution or debating the way it is used. However, in other cases like the AfC process on Wikipedia, a newcomer has more agency in negotiating the outcome of their work being processed. As I describe in the AfC case, some newcomers respond to the directives that are

given to them so that their article will meet quality standards, while others may not respond and attempt to move forward with their article going against the recommendations given to them.

The tactic of guided contributions manages the periphery of participation by aligning the contributions of newcomers with standards of practice so that they can be of value to the project. By providing directives, shaping participation through platform features, and processing the contributions, the guided contribution strategy manages the periphery of participation by making a newcomer subject to the authority of platform experts and leaders, constraining and enabling the agency of newcomers toward clearly defined ends.

This tactic of guided contribution reflects an overlap of institutional and individualized socialization strategies in the way that institutionalized tactics are often nested within individualized learning experience. Where all newcomers may receive the same directions or have their tasks framed in the same way, they often experience these directives and task framings as participants, not as segregated from the rest of the project. In this case, the overlap between institutionalized tactics and individualized tactics is apparent, where newcomers are at once already participating with everyone else but are engaging different features that ensure that they will have a common experience of participation so as to promote predictable and homogeneous behavior. For example, the AfC process provides feedback based on established workflows for evaluating articles, or the zoom tool on Planet Hunters has fixed zoom functions, ensuring that newcomers will analyze the data based on scientifically sanctioned parameters. Other guided contribution strategies reflect uniquely institutionalized approaches, where a

newcomer's work is removed from the project for evaluation before it can have an impact, or a newcomer's participation is guided and segregated from the very beginning.

Where current research on newcomers to participatory platforms focuses on the different opportunities available for new users to contribute to (Bryant et al., 2005; Lampe et al., 2012; Narayan et al., 2015; Østerlund & Crowston, 2013), the tactic of guided encounters demonstrates how opportunities for participation can be and are constrained to align newcomer work with the needs of a project, showing how institutionally approved practice can be promoted and perpetuated at different moments throughout a newcomer's experience with a platform. Here we see ways in which the importance of access to situated practice that is critical to newcomer learning (Lave & Wenger, 1991) is not beyond the grasp of platform experts and leaders that wish to influence how newcomers contribute.

Resisting Guidance

Newcomers may encounter a series of features that work to align their activity with established standards of practice, however in some cases they may find that such standards are not aligned with their personal goals of participation. Depending on the affordances of the platform, a newcomer may resist the guidance they are receiving and do work that intentionally conflicts with project standards. Such resistance is defined as nonmalicious behavior, intended to push the boundaries of current definitions of project practice that may ultimately help the project. Resisting guidance is conducted outside of project practice, or in the margins of the platform. In the example from Wikipedia, I describe the editor who contends with the limitations of writing articles about women in science in the Articles for Creation process by writing her articles offline and in her sandbox, and then submitting directly to the main article space without using

AfC for feedback. In this example of the newcomer avoiding and resisting guidance, the periphery of participation is managed in the way it affords opportunities for participation at the margins, where newcomers can retreat to redefine their approaches to doing work before they return to the project and make more contributions.

In a later section of this chapter I will expand on this idea of the margins of participation, further elaborating on the role it plays in the newcomer experience and broader project management strategies. For now, it is important to highlight that such forms of resistance and the sociotechnical construction of affordances for such activity are not accounted for in existing research on newcomers. Highlighting how such transgressive activity plays out is important in that it shows to what extent platform leaders and experts intentionally or unintentionally limit opportunities for inclusivity. While a platform like Wikipedia may have well-established norms of participation, the case about articles on women and science and the AfC review process demonstrates how some peripheral management strategies may prevent new perspectives from newcomers in underrepresented groups on Wikipedia from changing the course of the project toward more inclusive and representative practice. By maintaining opportunities for resisting the guidance of AfC, the periphery of Wikipedia, while well defined, ensures opportunities for growth thanks to new participants and new perspectives, promoting inclusivity despite mechanisms like AfC that can challenge such growth. Furthermore, resisting guidance also shows that the newcomer experience is not binary, where a newcomer's experience is defined by acceptance or rejection, rather it shows that how a newcomer is actively negotiating their place in a project, at times operating in limbo states where they rework their contributions.

6.2.3 Targeted Encounters

In many peer production projects, newcomers can start contributing from the moment the platform loads in their browser. This low barrier to entry is a key component to encouraging participation, however in order to promote quality control in light of low barriers to entry, mature peer production projects deploy algorithmically assisted editing tools that detect institutionally recognized behaviors that do not align with standards of practice. Once one of these algorithmically assisted editing tools, or bots, identifies a newcomer as engaging in a particular infraction, the bot may fix the problem and/or send a template response that addresses this infraction and proposes directives on how to fix the problem. In the case of Wikipedia, newcomers often have libraries of template messages that were delivered by bots on their user talk page, with the messages describing different errors they committed and how they might fix them. Such individual collection of messages reflects the aggregate of a learning experience where, based on their participation, they receive standardized feedback about their work.

The targeted encounter at the periphery reflects a newcomer experience where there is an overlap between institutionalized and individualized socialization tactics in the following ways: First, the template responses reflect characteristics of collective tactics in that newcomers receive uniform messages written by platform experts. Because all newcomers receive the same response, institutionalized tactics are being deployed to encourage newcomers to respond to such situations in a common way. At the same time, however, this tactic reflects variable tactics in that a newcomer doesn't know what the next stage of learning will be since the next message they may get is entirely dependent on the actions they take. The

experience is also informal in that the newcomer is learning in situ, participating alongside existing and established members. However, in some cases, when the work of a newcomer is reverted, their work is cast out of the project, with the newcomer being encouraged to figure out how to make a contribution correctly before they participate in the main space again. Such suggestions promote a formal socialization tactic, encouraging newcomers to segregate themselves. Removed from making contributions, they learn how to participate and renegotiate their approach to making contributions.

While the targeted tactic affords newcomers the opportunity for some degree of unconstrained participation, they do so within a region of participation monitored by detection tools that will respond to and redirect the participation of newcomers into positions subject to the authority of project experts, in turn promoting a homogeneous, stable, and predictable region of participation.

The role that targeted encounters play in promoting a homogeneous, stable, and predictable region provides unique insight into how we understand the interaction between newcomers and experts and, in particular, the role of feedback. While researchers have explored the effects of different content in template messages on newcomer retention and participation quality (Faulkner et al., 2012; Halfaker et al., 2011; Pinchuk, 2011) researchers have not examined how the templates reflect institutionalized practices of managing the newcomer learning experience. As tools for representing stable and consistent knowledge about participation to newcomers, templates are also silent but key actors in how experts, and in some cases, newcomers, interact with newcomers that are doing work incorrectly. As the findings show, the act of providing feedback is not a uniquely intersubjective act, in that the

communication is framed by an artifact, a standardized template message, with the sender speaking through the template to the receiver. Furthermore, while it is not apparent to the newcomer, specific actions will elicit corresponding responses from bots that deliver particular messages. Such a close connection between the actions of newcomers and particular messages they receive points to what can be described as an emergent institutional strategy for shaping the newcomer learning experience, with a library of approved messages for particular actions defining what content newcomers will encounter and when. While the seemingly ad-hoc convergence of heterogeneous volunteers and the need for low barriers to participation may make delivering common and consistent material to newcomers appear to be a difficult if not an impossible scenario (Kraut et al., 2011), the tactics of targeted encounters demonstrate how approaches to feedback for managing newcomers have achieved a degree of consistency in shaping newcomer learning.

6.2.4 Conclusion

Taxonomies of encounters help advance an understanding of what the conditions for participation look like at the periphery of participatory platforms. Whether self-guided, guided, or targeted, the various encounters articulated in the taxonomy demonstrate how experts and leaders wrangle the ad-hoc heterogeneous bodies of volunteers into moments where the volunteers are made subject to the authority of experts and leaders, capturing and directing their attention toward content and instructions that define and perpetuate project goals and ideals.

In showing the different ways newcomers are made subject to the authority of experts and leaders, the various encounters show how institutional models of newcomer socialization

can exist within an individualized learning experience, demonstrating that while direction and motivation for learning and participation are driven by the individual, their actions are situated in an ecology that, from one moment to the next, constrains how they learn and participate. The taxonomy also reflects how the conditions of peripheral participation on participatory platforms is defined by the varying moments where newcomers negotiate tactics that draw them into positions subject to the authority of experts and leaders.

6.3 Comparing the Cases: Managing Versus Owning the Periphery

The proposed taxonomy of encounters describes the tactics used to capture the attention and constrain the participation of newcomers, placing them in relationships of subjecthood to the experts and leaders of participatory platforms. In a mature peer production setting, I observe how there are a number of different tactics that are deployed to situate newcomers into these relational constraints on learning and participation, however it is not always guaranteed that newcomers will comply with the constraints. On the other hand, in the crowdsourcing case, I observe that the periphery of participation is more rigid, with few opportunities to circumvent the constraints on learning and participation.

The strategies for managing the periphery of participation across the two cases varied based on the degree to which self-guided exploration was allowed. While a series of encounters in the Wikipedia case often emerged after a self-guided exploration of the platform, the encounters on Planet Hunters occurred in a constrained setting where there was no way around a newcomer immediately being guided toward a position of subjecthood. This distinction lends itself to what I describe as the key differences in the two cases: managing versus owning the periphery of participation.

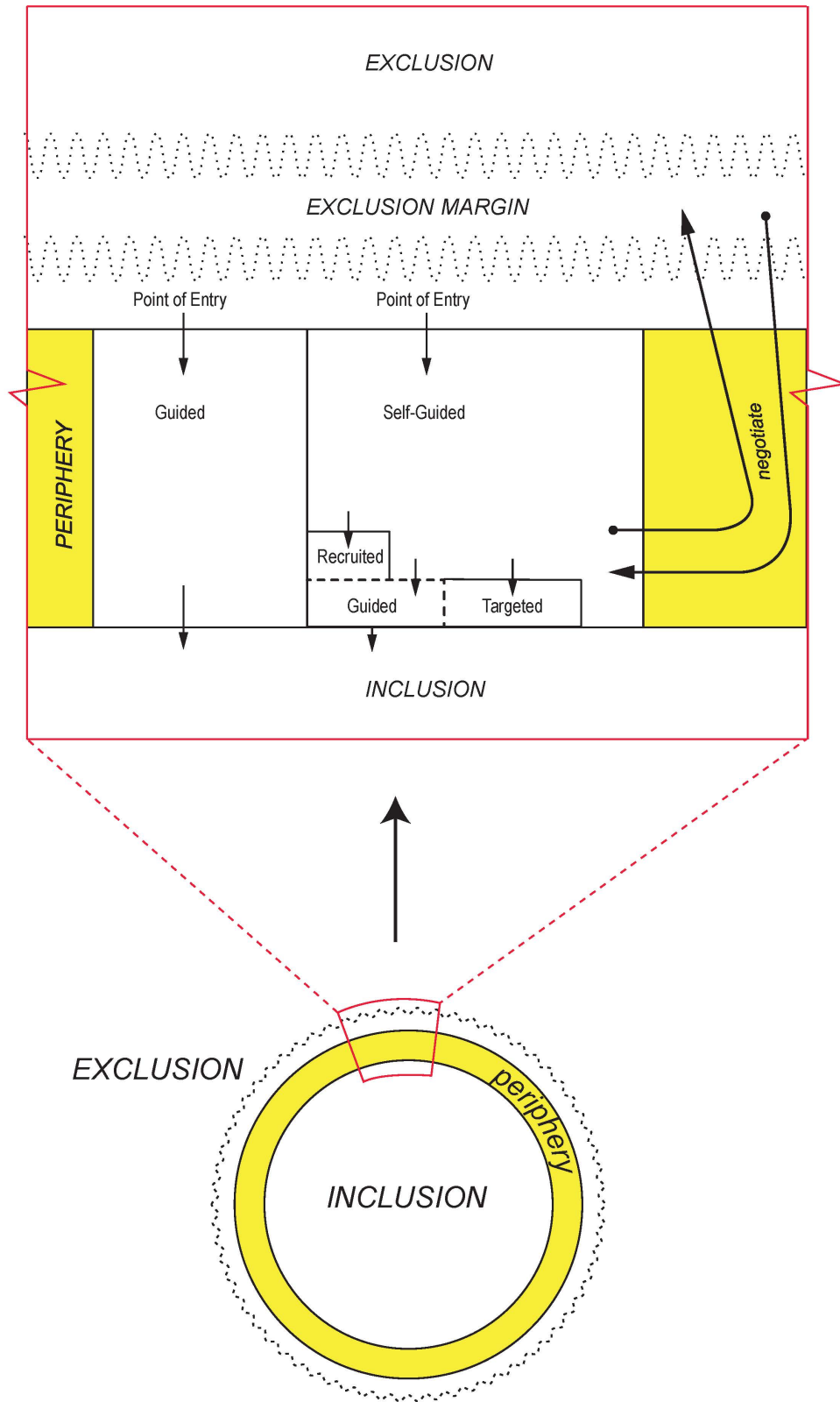


Figure 6.2 Wikipedia periphery management tactics

As Figure 6.2 reflects, the only instance of owning the periphery in the case of Wikipedia was seen in the classroom example, where from the very beginning of their interaction with the platform, the newcomers had instructions on what to do and how to do it. This being the only exception, the rest of the encounters occurred after the newcomer started off exploring the platform on their own terms, subsequently stumbling upon or being recruited to encounters with newcomer support features.

In the case of Planet Hunters, the periphery of participation is more accurately described as being owned by the science team that runs the project (see Figure 6.3). Here, the earliest experience with the platform is one of being guided toward a setting where the newcomer's agency is constrained by a tutorial that defines what they need to learn, a persistent set of instructions that defines what they need to do, and tools to help them do work calibrated to specifications defined by the science team. In the case of owning the periphery, very little is left to the imagination for how to do the work. Newcomers describe a tight relationship between doing the work and referring to help resources when they are uncertain about what to do. Indeed, there are newcomers for whom the resources provided are not sufficient to satisfy their curiosity, driving them to look for resources outside of the platform to help them learn. However, this does not complicate the fact that the intent of the science team is to carefully curate and define the experience of new volunteers by dominating the interface of participation on the platform with tactics that define learning and participation. By contrast, newcomers to Wikipedia do not always encounter such resources early on and even when they do, there are few mechanisms that require them to follow through with using the resources.

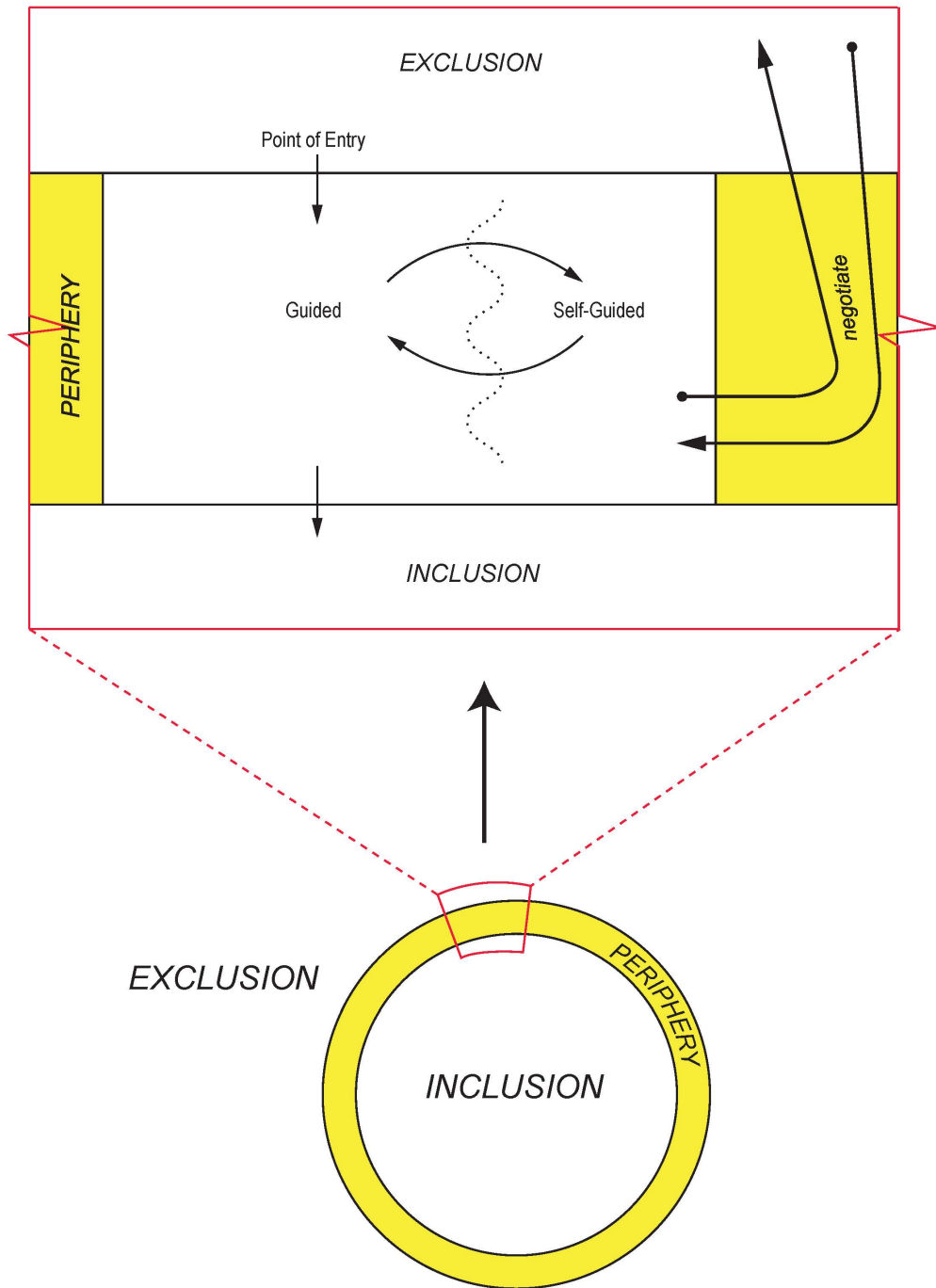


Figure 6.3 Planet Hunter's periphery management strategy

6.4.1 Margin vs. Periphery

The theme about participation in the margins offers a perspective about newcomer participation that is distinct from the idea of peripheral participation that is popular in newcomer learning research. While the idea of margins bears resemblance to the idea of the periphery in that it reflects a condition of being on the outer edges of a project, it is distinct in that the idea of peripheral participation in Lave and Wenger's work is tied to the idea of legitimacy, implying that the work being done by the newcomer is tied to the dominant practice of the community and is considered acceptable by experienced participants, even if the impact of the work on the community is minimal. The margin is, instead, a space that exists one step beyond the periphery, where, as the Wikipedia case suggests, learning in the context of the margins takes place in a space where participation is not seen as legitimate and must exist as separate from the rest of the project.

The idea of margins of participation extends our understanding of what participation and learning looks like on participatory platforms and where they take place. In my findings, the margins of participation appeared both as an explicit space designated for experimentation as well as a newcomer tactic for avoiding spaces of the platform that are saturated with authority. In the case of an explicitly designated space for experimentation, margins of participation suggest a novel insight into how platforms balance quality control with opportunities for learning. Drawing on Lave and Wengers' theory of legitimate peripheral participation, the idea of the periphery is imagined as the primary location for the initial learning experience of newcomers (Bryant et al., 2005; Ducheneaut, 2005; Fang & Neufeld, 2009; Halfaker, Keyes, & Taraborelli, 2013b), however the notion of legitimacy limits our conception of how newcomers

often do work that is not approved and requires them to rethink their approach. Platforms like Wikipedia offer spaces like the sandbox where experimentation and development can take place without fear of encountering the authoritarian gaze that demands that content adhere to project standards. In the use of the explicitly designed spaces like the sandbox on Wikipedia, a newcomer chooses to operate on the margins of participation after making the decision to respond and adhere to feedback about their work that has been marked for deletion or rejected from a review process. In this example, a newcomer moves back and forth between the margin and the main article space of Wikipedia, reworking their article in the margins and testing out their changes in the main space. The presence of a space explicitly designed for experimentation and used by newcomers to reassess their approach before participating in the main space of a project reflects characteristics of formal socialization tactics where newcomers are removed from practice before they can participate. As the text at the top of any user's sandbox page states, the sandbox "serves as a testing spot and page development space for the user and is not an encyclopedia article." While a newcomer is not removed from the very beginning of their participation with a project, the purpose of a feature like the sandbox is to encourage users to segregate themselves from the main project space while they learn how to contribute.

In the case of the margins as a tactic for avoiding authority, a newcomer negotiating power relationships in Wikipedia decides to avoid certain spaces of a project that are focused on upholding standards of participation and opts instead for spaces that are less likely to be subject to such standards. For example, in the case of the Articles for Creation review process on Wikipedia, a newcomer who was getting her work repeatedly rejected did not agree with

the standards used to reject her article. Once she was aware that she did not have to submit her work through a review process, she decided to avoid having these standards applied to her work and avoid the process altogether. Avoiding the process involved developing the article offline and then submitting the article directly into the main article space. By avoiding the review process, she avoids a space in the project that has become an integral part of the new article creation process, with a series of tactics that work to direct the attention of editors to the review process so as to make them subject to the authority of experts. By avoiding this process, she decided to operate outside of a space where the strict application of project standards would make it difficult to have her work accepted. While her work is still submitted to a live article space, it is done in a way that operates on the margins of spaces saturated with the authority of project experts.

6.4 From Socialization Tactics to Encounters with Authority

The taxonomy demonstrates how institutionalized socialization tactics do not require settings where experts and leaders have complete control over the movement and makeup of new members, such as newly hired employees in a corporate setting. Rather, the taxonomy shows how newcomers encounter institutional constraints as they oscillate between moments of individually driven contributions and institutionally defined learning and participation. What the idea of encounters helps to emphasize is that newcomers to participatory platforms, for the most part, often encounter institutionally sanctioned content for learning, receive specific feedback to particular actions, or have their participation constrained so as to align newcomer actions with particular standards of participation. Each of these examples show moments when

experts and leaders are able to capture and direct the attention of newcomers, even if that moment is fleeting.

As the taxonomy suggests, there are a number of tactics deployed by experts and leaders that inform a newcomer's experience with learning and participation. While previous research on newcomers to participatory platforms is correct in claiming that platforms cannot deploy a strict definition of institutionalized socialization tactics (Farzan et al., 2012; Kraut et al., 2011), such assumptions overlook explicit tactics by expert members and leaders to guide the activity of newcomers toward standards of practice defined by expert members and project leaders. By developing this taxonomy, I argue that it is insufficient to view the periphery of participatory platforms as uniquely open and unorganized spaces that newcomers must make sense of on their own; rather, the periphery of participation is actively managed by a range of explicit sociotechnical tactics that work to constrain and enable the agency of newcomers based on institutionally defined modes of practice, and in some cases, tactics that involve creating a space of reprieve from such institutionally constrained practice.

By describing the existence of institutional characteristics in the various encounters, the taxonomy reveals overlaps between characteristics of individualized socialization tactics and institutionalized tactics. In doing so, the newcomer experience is depicted as not uniquely defined by an active newcomer encountering a passive organization, waiting for a newcomer to make sense of it; rather, by examining the periphery as a managed space of a project, the newcomer experience is described as an encounter between the newcomer and explicit tactics designed by platform leaders and experts to not only inform how a newcomer learns to contribute, but to inform the very act of contributing to the project as well. For example,

framing the periphery as a managed space describes how the policies and guidelines that define the practice of a platform do not merely exist as documents waiting to be read by a newcomer; they are also encoded and inscribed into the conditions of the technical infrastructure of the periphery, with the constraints of the policies and rules enacted in the use of features that newcomers encounter throughout their initial experience of participation.

The taxonomy of encounters builds on some of the earliest research on newcomers to participatory platforms by acknowledging the role of implicit and explicit tactics for managing the periphery. For example, drawing on Lave and Wenger's theory of legitimate peripheral participation, work by Ducheneaut (2005), Bryant et al. (2005) and Preece and Schneiderman (2009) describes the newcomer experience as a personal journey toward a gradual alignment with established standards of practice, learning new polices, incorporating new tools, eliciting feedback, and building new relationships along the way. Such a perspective, while accurately capturing the experience of the newcomer, loses sight of the sociotechnical constraints of a platform that are explicitly deployed to inform the experience of the newcomer, steering them in the direction of established practice and project goals. The advantage of the proposed taxonomy of encounters is that it helps to situate the individual journey of a newcomer alongside these explicit tactics designed to manage the periphery of participation.

Defining the periphery of participatory platforms also builds on the momentum of existing research that focuses on the increasingly prominent role of nonhuman actors that shape the newcomer experience. Geiger et al. (2012) suggest the idea of regimes of socialization as a way of describing the overlap between the individualized experience of the newcomer in light of a broader organizational strategy that handles the infractions of

newcomers on a case by case basis using bot-based technology. Similarly, Halfaker et al. (2013) describe the role of bots in managing the activities of newcomers as a form of sociotechnical gatekeeping. Such work is aligned with what I propose in the taxonomy of encounters in that it points to explicit tactics delegated to sociotechnical systems to manage newcomer activity based on institutionally defined standards of quality and participation. While integral to managing the periphery of participation, such work only reveals one aspect of the growing spectrum of tactics that are being deployed not just in mature peer production settings, but on crowdsourcing platforms as well. Furthermore, such work on algorithmic governance only reflects on how such technology handles the work of vandals but does not also consider how it impacts the user of the technology, situating them within an algorithmically defined field of participation that frames not only their vision but their voice as well. Such tactics of framing the vision of a participant are also evidenced in the crowdsourcing case of Planet Hunters where newcomers are given a limited number of zoom options when analyzing light curves.

Finally, the taxonomy of encounters and definition of the periphery as a managed space speaks to a growing conversation amongst scholars that seeks to redefine conceptions of openness and participation on digital participatory platforms (e.g., Barney et al., 2016; Brabham, 2013; Gillespie, 2010, 2015; Kelty, 2016)). Such scholarship takes as its point of departure a need to revisit the early excitement over digital participatory culture that celebrated the work of fan fiction communities (Jenkins, 2006), political protest organized through SMS messaging (Shirky, 2008), and the new organizational modes of production that operated in distinction from market and firm-based models of coordination (Benkler, 2006). In such examples, excitement centered around how the participation coordinated in the

production of cultural artifacts, political action, and economic goods stood in contrast to the traditional gatekeepers of high costs of production and expertise, pointing to an openness in participation that ushered in new opportunity for the inclusion of diverse views.

These early utopian visions of digital participatory cultures are, however, being revisited now that many of the prominent early peer production projects like Wikipedia, Linux, and Ushahidi that were celebrated for their open and bottom-up approaches to coordination demonstrate a noticeable shift toward more routinized, bureaucratic, and hierarchical characteristics of production (Butler et al., 2008; Kelty, 2016; Shaw & Hill, 2014). Recognizing the changing landscape of participatory culture, Kelty and Erickson (under review) explore over 100 different digital participatory platforms, finding that, while many platforms may place a high value on participation rhetorically, it is not structurally guaranteed, with some platforms offering opportunities to shape the direction of the project while others constrain participation to the boundaries defined by the platform leaders and experts.

Such work by Kelty and Erickson and others motivate a need to push past the digital utopias celebrated in early definitions of participatory culture. As Darin Barney and his colleagues point out, “While numerous participatory media projects rely on a colloquial understanding of openness – simply allowing anyone to participate – in practice, openness is operationalized distinctively as an endeavor” (Barney et al., 2016, p. 26). In my findings and through the proposed taxonomy of encounters, I explore how participation and openness is operationalized, examining how the conditions of digital participation vary from one context to the next. In particular, the idea of encounters speaks to this question of how openness and participation are constructed by examining how opportunities for learning and participation are

made available to newcomers. As I propose in my taxonomy, the experience of participants at the periphery of participatory platforms is defined by a series of encounters with the authority of experts and leaders of that platform. In the varying encounters, we observe how newcomers are positioned in relationship to the authority of the platform and what constraints and affordances are present in these encounters, shaping and defining how newcomers will learn and participate. By focusing on the periphery, the taxonomy of encounters is particularly useful in that it helps to reconcile Eric Raymond's famous mandate that open source platforms maintain low barriers to initial participation (Raymond, 1999) with the growing recognition that such platforms are no longer the free and open spaces they were originally thought to be.

By taking a sociomaterial perspective, the taxonomy speaks also speaks to the call to explore the conditions of participation using a relational perspective (Barney et al., 2016). As Barney et al. suggest, participation, broadly understood, can be described as a response to an ideological hail, or what Althusser describes as appellation (Althusser, 1971). Here we describe participation as becoming subject to the ideologies of the context that we engage. Participation then is understood as a relationship to the ideologies of the context of participation and how such ideologies are enacted and deployed and, in turn, how we as participants situate ourselves in that ideological hail. How we find ourselves in that ideological hail and how such ideologies are deployed and enacted are how we understand the conditions of participation, and in the case of the taxonomy of encounters, I propose a range of tactics regarding how such ideologies are deployed and how they are enacted relationally with the newcomers on the periphery of participatory platforms, defining the conditions of their participation and learning.

As the conversation about online participatory models of production moves away from the early excitement over the broader notion of participatory culture and toward a more nuanced understanding of how institutional conditions actively inform different styles of participation in open digital settings, a vision of the newcomer experience emerges that moves past the idea of the informal and individual experience. In this new image of the newcomer experience, the institutional conditions that exist at the periphery of participation come into relief, showing us the guardrails that orient newcomers toward alignment with institutionally defined directives of the platform from the earliest moments of their participation.

6.5 Implications for Design and Management of Participatory Platforms

Participatory platforms live and die by the engagement of their volunteers, therefore finding a way for their work to be of value to the growth and sustainability of the platform is imperative. As researchers have shown, how platforms manage the periphery of participation has critical implications for the sustainability of a project (Halfaker, Geiger, Morgan, & Riedl, 2013a; Raymond, 1999), therefore, attending to different tactics for managing the newcomer experience is an issue of paramount importance. The taxonomy of encounters helps to situate a number of growing tactical interventions for managing the periphery, offering designers and managers a description of different possibilities and scenarios for balancing the tension of being welcoming and inclusive while also supporting and promoting specific standards of participation. In particular, the taxonomy of encounters demonstrates that the heterogeneous and ad-hoc convergence of individual drives and desires are not at odds with designing and promoting institutionally defined constraints on participation and learning. By demonstrating how newcomers oscillate between moments of learning and participation defined by their own

motivation and moments of learning and participation defined by the needs of the project, a designer or community manager can play with these dynamics to maximize how a newcomer learns.

As I suggest throughout this thesis, using the relational tool of Sørensen's forms of presence for understanding the newcomer experience frees us from having to view the conditions of participation as an either/or situation, locked into wrangling individually driven newcomer learning or locking down their experience through rigid institutional models. Rather, what the framing of a newcomer experience as a relational construction of agency offers is an approach that reconciles the individual drive of the newcomer with moments where they are drawn into institutionally constrained modes of learning and participation. In addition to being a valuable analytical approach for scholars, holding this tension as the representative condition of the newcomer experience at the periphery of participatory platforms can, as I will describe in detail, serve as a useful conceptualization for designers and managers addressing the experience of newcomers on participatory platforms. What the taxonomy offers is a particular goal for managing the newcomer's experience, which is to direct the attention of newcomers toward encounters with authority in moments where their learning and participation is defined by boundaries imposed by the experts and leaders of the platform. In the remainder of this section, I describe different subquestions that designers and managers can ask themselves when thinking about the conditions of participation at the periphery of their platforms.

6.5.1 Total Guide Experience

By framing the newcomer experience as a series of different encounters with the authority of the platform, designers and managers are first presented with a decision on whether or not to

deploy a total control over the periphery or allow for the newcomer experience to oscillate between moments of self-guided learning and participation and guided learning and participation. My findings suggest that the total guide encounter with the periphery is appropriate in situations where the need for data quality and the existence of time constraints are most demanding. Such approaches are also contingent on available resources for what amounts to a top-down form of control over participation and learning at the periphery. In the example of the Wikipedia in the classroom initiative, the total guide strategy was deployed as a collaboration between staff at the Wiki Education Foundation, the classroom professor, and learning materials defined by the foundation such as reference guides and tutorials for both students and teachers. In this case, the participation of the newcomers (the students) was constrained by the curriculum goals defined by the teacher and foundation staff and their learning was defined by the abovementioned materials. In this example, the success of the newcomer work is noted by the inclusion of newcomer work as indicated on the Wiki Education Foundation dashboard; however, achieving such results requires a great deal of effort and time on the part of teachers and staff who monitor, support, and guide the newcomers throughout their initial experiences with Wikipedia. As such, designers must weigh the suitability of a top-down approach for managing newcomers, considering the need for a predefined audience (e.g., classroom) as well as the human capital required to deploy the effort. If specific outcomes are needed within a constrained period of time (e.g., a semester or 3 months in the case of the classroom initiative) and there are particular quality standards, the total guide model may prove to be valuable. Similar total guide experiences are deployed in the context of Wikipedia in what are described as edit-a-thons, where Wikipedians will organize events at museums and

libraries to support and guide new and experienced editors in the creation and improvement of articles within a constrained period of time (Oliver, 2015).

In the case of Planet Hunters, the resource-intensive approach to total guide is motivated by a need for data quality requirements. In my conversations with and observations of scientists working with the platform designers at the Adler Planetarium, a key concern was how to ensure that data quality from volunteers would meet the needs of the scientists, who eventually inherit the product of data classified by volunteers. With seemingly little room to accommodate error or to address and correct error at later stages, designers of the Planet Hunters platform immediately situate newcomers into settings where they are engaging in simulated participation while also being provided with information about participation as defined by the scientists running the project. Like the Wikipedia in the classroom approach to newcomers, the total guide tactic immediately and forcefully directs the attention of newcomers toward the instructions and information defined by the scientists to address the quality standards required of volunteer contributions.

6.5.2 Nested Encounters: Guided Experience Within Self-Guided Exploration

The total guide model requires considerable oversight and management and, in the case of both Wikipedia in the classroom and Planet Hunters, the support of a well-defined group of participants operating within a complementary organizational structure. Furthermore, as the previous description of total guided approaches to managing newcomers implies, defining the conditions of peripheral participation may be motivated by particular pressures relating to needed outcomes for the project.

With the exception of examples like Wikipedia in the classroom, Wikipedia relies on what can be described as market-based pressures, where the quality of an article is based on the demand for quality actualized by editors paying attention to it. Therefore, quality of product is often a condition of multiple iterations that take place over time rather than in the first pass of an individual's or group of volunteers' work. This iterative approach to quality also lends itself well to an iterative style for newcomer learning and participation, where a newcomer begins by first exploring on their own, making a few contributions, and then coming across moments where their attention is drawn toward encounters with authority. In what can be described as an iterative approach to managing newcomer learning and participation, designers and managers can identify different trigger moments that act as opportunities to draw the attention of newcomers toward institutionally defined sources for learning and modes of participation. As the literature shows, these responsive models to managing newcomer participation have been shown to be effective and demonstrate how institutionally approved content for learning and modes of participation can be promoted in heterogeneous and ad-hoc environments by targeting promising participants throughout their early engagement with the project rather than relying on upfront and early training. For example, tactics that recruit newcomers toward encounters with authority in Wikipedia are designed to identify promising participants, immediately grouping them together and singling out participants into a homogeneous category of volunteers that show promise as valuable contributors. Such recruitment models and the subsequent participation of newcomers who have gone through them show significant differences in performance compared to those volunteers with similar

promise that were not recruited (Morgan et al., 2013). Similarly, targeted models of templated feedback have been shown to improve the quality of contributors (Halfaker et al., 2011).

Such examples of tactics nested within individual exploration are particularly useful for maintaining low barriers to participation while also ensuring that, as newcomers move along through their initial experience, they encounter modes of participation and learning that represent some degree of institutional consensus. Furthermore, in settings where dedicated groups of participants, such as paid staff focusing on issues of quality control, are not available, tactics of guided encounters existing within self-guided encounters offer viable solutions for addressing issues of quality control and newcomer learning.

6.6 Conclusion

The experience of newcomers to participatory platforms can be described by the various encounters they have with authority. While a newcomer may begin making contributions almost immediately in both contexts of digital crowdsourced and peer production platforms, their participation is constituted by their relational position to the experts and leaders that define the ideals and goals of the platform.

In this chapter, I proposed a taxonomy of encounters that unpack these various tactics and the negotiation of tactics that position newcomers in relationship to the authorities of platforms. This taxonomy demonstrates how the perpetuation of institutional modes of learning and contribution can be achieved, nested within the individually driven experience of an ad-hoc heterogeneous body of volunteers. By describing the various encounters with authority, the taxonomy contributes to a growing body of work that seeks to refine our understanding of what openness and participation mean in digital participatory culture, driving

toward definitions that reveal the varying ways openness and participation are operationalized. Furthermore, the taxonomy helps designers and managers of participatory platforms navigate the tension of maintaining low barriers to participation while also promoting and perpetuating institutionally approved modes of learning and contribution.

By emphasizing these encounters with authority and how they position newcomers in relationship to the authority of the platform, the taxonomy of encounters proposed in this chapter helps to advance the idea that, while there are indeed low barriers to initial contributions on participatory platforms, we cannot lose sight of the guardrails that define the ways in which opportunities for newcomer contribution and learning are made available.

Chapter 7: Conclusion

7.1 Revisiting the Conditions of Peripheral Participation

Nathaniel Tkacz suggests that the concept of openness as it relates to opportunities for participation on platforms like Wikipedia is a complex endeavor (Tkacz, 2014). As much as we would like to call Wikipedia an encyclopedia that anyone can edit, the celebrated low barriers to participation that Raymond declared as essential to successful open online collaborative projects (Raymond, 1999) are in fact not low at all, and newcomers to platforms like Wikipedia must negotiate a range of sociotechnical constraints and affordances that amount to a form of gatekeeping that defines their initial experience (Halfaker, Geiger, Morgan, & Riedl, 2013a). In this dissertation, I focused on this idea of low barriers and the periphery of participatory platforms, or the space where a participant casually observes ongoing work and makes small contributions as they learn how to participate (Bryant et al., 2005; Lave & Wegner, 1991; Preece & Schneiderman, 2009), so that we might construct a new description of peripheral participation that accounts for the range of sociotechnical constraints working to define opportunities for newcomers to learn and contribute. In examining the conditions of peripheral participation, I propose that we consider the guardrails of peripheral participation, or the moments where newcomers are routed into positions of being subject to the authority of the experts and leaders of participatory platforms, and how these positions of subjecthood define opportunities for learning and contribution at the periphery.

To explore this question, I looked at two cases, Wikipedia, a mature peer production platform, and Planet Hunters, a crowdsourced citizen science project. These cases each reflect

different approaches to engaging volunteers, with the former allowing for more flexibility in choosing how one wants to contribute and the latter defining what tasks are done and how they must be executed. Using cases that are classified as two distinct models of participatory platforms (Brabham, 2013; Kelty & Erickson, n.d.), I examined the conditions of peripheral participation in each case, where the periphery is understood as a conceptual reference to the edges of a platform or a space where a newcomer first encounters a project, and conditions describe the constraints and affordances that define opportunities for newcomer learning and participation. Data gathered from each case was analyzed using a practice-based sociomaterial lens, highlighting the configuration of relationships that newcomers have with human and nonhuman actors, paying particular attention to the characteristics of these relationships as they relate to opportunities for learning and participation. By paying attention to sociomaterial production of opportunities for learning and participation, this analysis accounts for both the institutional constraints that newcomers encounter and the way in which newcomers negotiate these constraints.

7.1.1 How Do Experts and Leaders Define Conditions of Participation at the Periphery?

Managing newcomers to participatory platforms has been framed by scholars as a difficult proposition in that, compared to the onboarding process for new members in a corporate setting, platform managers are not in a position to vet the background of their volunteers nor can they force them to jump through too many hoops for training (Farzan et al., 2012; Kraut et al., 2011; Raymond, 1999). However, if such approaches to newcomer onboarding consistently demonstrate positive results in creating homogeneous responses to varying experiences (Jones,

1986), promoting a degree of stability in a corporate setting, how can managers of online platform achieve similar results under different circumstances?

In Chapter 4, I describe various points of entry, or the explicit tactics that project leaders and experts deploy in order to lay claim to the periphery of participation, shaping the way in which newcomers learn and contribute when they first encounter the platform. Across the cases, points of entry describe the conditions of participation where newcomers are immediately (or within moments after their initial contributions are made) subject to the authority of platform experts and leaders. The tactics of points of entry accomplish the creation of subjecthood in the way that the attention of newcomers is captured, directing them toward tasks and lessons that have been defined by the experts and leaders. For example, newcomers to Wikipedia, after making a few contributions, may receive invitations to take a tutorial or participate in a space where they can ask questions and get responses from experts, or they may receive a deluge of template messages about how their actions do not align with project standards along with the steps they must take to correct them. On Planet Hunters, newcomers are, from the moment the website loads in their browser, brought to a short tutorial that engages newcomers in simulated tasks. Throughout these examples, I describe various instances of how the conditions of peripheral participation reflect tactics to position newcomers as subject to an authority, making newcomers aware that there are standards regarding how work is done in the project. Such approaches are designed to deliver information that all newcomers will encounter, ensuring some degree of homogeneity and consistency in the experience of all newcomers which, as various organizational socialization researchers have found, can lead to more predictable newcomer behavior (Ashforth & Saks, 1996; Jones, 1986;

Saks & Ashforth, 1997a). Points of entry therefore suggests that a newcomer at the periphery of a participatory platform is not alone in their exploration of how to make sense of their new environment. Indeed, the theme accounts for the range of nonhuman actors that play an active role in defining the opportunities for learning and participation, from the help button on Planet Hunters that is ready at hand for newcomers that have questions while they are doing work, to the bots on Wikipedia that deliver messages to newcomers about how they need to make changes to their work. Points of entry, as a theme, provides a number of examples of how platform experts and leaders have laid claim to the periphery, guiding and shaping how newcomers learn and contribute.

7.1.2 How Do Newcomers Negotiate Conditions of Participation?

Similar to the previous question, this question also addresses how newcomers find themselves in relationship to experts and leaders of platforms. In this theme, however, the question focuses on how newcomers negotiate the conditions of participation at the periphery, pointing to the outcome of their participation: whether or not the contributions of a newcomer have been included or excluded from the project. Attention to inclusion or exclusion of work points to the broader consideration about what participation means in digital settings. As Christopher Kelty suggests, in order to be included in a particular social setting, one must participate, however participation in a setting does not automatically mean being included (Kelty, 2016). The question then of how newcomers negotiate the periphery so that their contributions will be included becomes an important part of how we understand the peripheral conditions of participatory platforms.

This dissertation reveals various approaches newcomers take to be included in a project as well as how they navigate rejection. For example, newcomers may find that they engage features that automatically bound their practice within well-defined regions of participation, drawing their contributions close to or aligning them exactly with standards of practice. In Planet Hunters, this is observed when newcomers use the zoom tool that was specifically calibrated by the scientists running the project, allowing newcomers to analyze data and make comparisons in ways similar to the approach to analysis scientists would take. Another example on Planet Hunters includes newcomers recognizing the functionality of the data processing infrastructure, acknowledging that all of their contributions are aggregated into a consensus score, allowing them to not worry as much about accuracy and focus more on volume of work, which, as several volunteers describe, is the aspect of their participation that they see as being most valuable to the science team. On Wikipedia, newcomers may view and engage in vandal fighting using tools calibrated by an algorithm tied to a gold standard corpus of vandalism samples, detecting examples of vandalism that expert participants would notice. In cases of newcomer work being rejected, I observe how newcomers to Wikipedia will retreat to the margins of the project, spaces on Wikipedia where they can escape the authoritative gaze of experts. Here they take feedback into account and reframe their approach. Some newcomers are never able to leave this marginal space as their work is constantly rejected, while for others, tactics are deployed to avoid authority as much as possible and they seek out other marginal spaces to make contributions.

By examining how a newcomer's work is included or excluded, the binary question of whether or not a newcomer's work sticks with a project is combined with a qualitative and

relational understanding of how a newcomer comes to understand their relationship with the goals of a project as well as the tools and the people that define the infrastructure of participation. Elucidating these relationships reveals the different sociomaterial constructions of newcomer agency and how this construction is a performance of newcomers negotiating and situating themselves in existing practice in an attempt to have their work included in the project.

7.1.3 The Taxonomy of Encounters

Drawing on the findings as they relate to the sociomaterial construction of newcomer agency around opportunities for learning and participation, I developed a taxonomy of encounters that describe different moments where newcomers at the periphery of platforms find themselves as subjects to the authority of experts and leaders, navigating constraints and affordances around opportunities for learning and participation. Building on early conceptualizations of peripheral participation in research on newcomers to participatory platforms, the taxonomy of encounters situates the individually driven experience of the newcomer alongside encounters with the authority of project experts and leaders. In these encounters, I describe the various tactics used to capture and direct the attention of the newcomer, making them aware of their place in a project and how they should contribute, while also imposing constraints on their activity, defining the boundaries of learning and participation.

What the taxonomy offers is an understanding that, as much as participatory platforms are at the whim of how a newcomer wishes to engage them, the periphery is a well-managed space of participation that defines and guides, through the deployment of various tactics, the opportunities for learning and participation that newcomers must negotiate. By describing the

conditions of participation at the periphery, the taxonomy helps to advance research on newcomers to participatory platforms, both by reframing how we describe the periphery as well as providing evidence that the idea of low barriers to participation mischaracterizes the conditions of participation at the periphery. In particular, the research reframes how we talk about the conditions of peripheral participation by showing that while institutionalized models of newcomer onboarding seen in corporate settings cannot be replicated, similar outcomes can be achieved through novel tactics that balance creating a homogenous newcomer experience in light of the ad-hoc and heterogeneous activity and characteristics of the labor pool of participatory platforms. The contributions to research also offer value to the practice of designing and managing participatory platforms, highlighting the different options designers and managers can deploy to define the conditions for learning and participation. It also draws attention to how newcomers negotiate these conditions and in some cases, how they resist and subvert the conditions of participation. As I describe in the findings, opportunities for resistance and subversion are important to the growth of the project and ensure degrees of inclusivity as well. In highlighting examples of newcomers resisting normative practice, this work advances an understanding of how practitioners can incorporate into their design opportunities for newcomers to navigate and challenge established conditions of participation.

7.2 Limitations and Future Research

The primary limitations of this study relate to the breadth of cases examined, both as it pertains to individual participants as well as the breadth of platforms as cases. For example, while varying patterns of participation at the periphery emerged, and an in-depth investigation into these patterns revealed how relationships to authority and the construction of opportunities

for learning and participation are performed, identifying these patterns across thousands of user accounts by drawing on server log data could help to strengthen or challenge the conclusions outlined in the taxonomy. One way to do this would be to use the technique of session level analyses of user behavior on participatory platforms (Geiger & Halfaker, 2013a), where researchers can reveal patterns of activity and feature use. For example, session level analysis has been used to examine different activity patterns and features used by newcomers to Planet Hunters as a way to infer emergent behavior and roles (Jackson et al., 2016). Analysis of newcomers to Wikipedia using session level analysis could reveal how newcomers oscillate between the different relational characteristics of learning and participation by looking at edit sessions that are prompted by receiving templated feedback or by using semi-automated tools versus sessions where they create new articles or add new content. Such large-scale analysis, if effectively operationalized, could help strengthen the validity of the different encounters in the taxonomy.

Another important limitation, that is due to challenges with sampling, relates to interviews with newcomers that have left the platforms after unsatisfying or unsuccessful attempts at contributing. Getting a response for an interview was often related to targeting accounts that indicated either frequent use or recent activity, where accounts that were inactive for more than a month often resulted in no response to an interview request. While I was fortunate to interview several newcomers to Wikipedia that were operating in a limbo state, attempting to contribute but continually being rejected, finding newcomers who were unsuccessful and left the project as newcomers never factored into my sample. Insight into unsuccessful experiences can help to demonstrate moments where guardrails of participation

become barriers, preventing participation and inclusion. Because getting interviews with such users is difficult, one possible route that researchers could take is to seek out accounts that display characteristics of newcomers leaving projects and reconstructing their experience through their traces of participation in server logs. Using session level analysis, researchers would examine traits across accounts to identify trends in their experience that may reflect the barriers that prevented them or discouraged them from further participation.

While an in-depth focus on the newcomer experience in the two cases above revealed valuable insight into peripheral conditions of participation, the strength of the taxonomy could be improved by looking across participatory platforms that vary in size and type. In the context of citizen science, Wiggins and Crowston (2011) describe varying models of volunteer engagement, with some offering different degrees of control by volunteers. Similarly, participatory platforms that vary in size feature different governance characteristics, with nascent projects often featuring less hierarchy and fewer roles than larger projects (Schweik & English, 2007). The varying characteristics of participatory platforms as they relate to governance could help to strengthen existing descriptions of encounters in the taxonomy as well as make the descriptions more robust, accounting for tactics that the two cases may not possess.

7.3 Platforms and the Agency of Participants

The enthusiasm of web 2.0 and participatory culture has long since given way to more nuanced explorations of what opportunities for participation are truly afforded and what openness means in the settings of participatory platforms. Indeed, it could be said that Lessig's famous statement that Code is Law, which came about at the height of the frenzy of participatory

culture, has finally cut through the excitement and become a rallying cry and a starting point for the growing critiques and analyses of the participatory condition. For Lessig, the idea of code as law shows how the rules and computational logic defining the functionality of online platforms shapes the types of user actions that can and cannot occur (Lessig, 2006). If we take Lessig's observation and the examples he provides to this point, we can see why, even at the periphery of participatory platforms, the idea of newcomers operating in an environment with low barriers to participation avoids pointing to the presence of institutional constraints that exist in the code of the platform. More broadly, as much as participatory platforms have been heralded as playing a part in redefining social formations of knowledge and media production, offering opportunities for greater inclusivity, the perception that their existence is the antithesis to firm- and state-based models of institutional form belies the ways in which traditional forms of power and control are replicated in seemingly new social formations. This dissertation is certainly not the first to point this out. Larger critiques of decentralization and internet governance have pointed to how power and control is replicated outside of centralized models of governance (Galloway, 2004). Many of the works cited throughout this dissertation have also shown how platforms defined by their "anyone can edit" ethos are not immune to the emergence of hierarchies (Butler et al., 2008; Crowston & Howison, 2006; Halfaker, Geiger, Morgan, & Riedl, 2013a) and in some cases oligarchical social formation (Shaw & Hill, 2014), establishing well-defined boundaries of what can and cannot be included in the project. As online platforms play an increasingly larger role in how we coordinate and define social interaction, it is important that we be aware of how platforms provide opportunities for participation and the outputs they create. Where Heidegger looked at the way technology

could enframe nature and, like the example of a hydroelectric dam producing electricity, calling forth particular outputs (Heidegger, 1977), we must also cast a similar analytical frame on participatory platforms and be mindful of how they are designed to call forth particular outputs of human activity.

As much as this work is motivated by growing scholarship on the conditions of participation, it is not the principal goal of this work to add only to this growing critical discourse of participatory platforms. Rather, the purpose of this work is also intended to contribute to the questions of how scholars as well as designers and community managers of platform technologies conceive of the newcomer experience and how they not only help orient newcomers toward an alignment with platform standards, but also help newcomers find their place and purpose in a project. Far beyond the cases of knowledge production investigated here, this question will no doubt continue to resonate in different contexts of platform-based coordination. For example, the sharing economy and the various platforms that coordinate people around the sharing of resources, such as spare rooms in their house or cars sitting in their driveway, all depend on newcomers being on the same page about how to participate with existing members (Mugar, 2016). Therefore, exploring and delineating the range of tactics that define opportunities for learning and participation at the periphery of platforms and the experience of newcomers in negotiating such tactics helps to make sense of how coordination, consistency, and growth can be achieved in environments that are perpetually bombarded with new people who are foreign to the established culture and practice of the platform.

APPENDICES

Appendix A Sample Interview protocol

Preparation for the interview: Write up a summary/review existing summary of their editing career to use for potential question prompts.

This interview seeks to explore how your participation in Wikipedia has changed over time. To understand this we will start by asking questions about how you currently participate in the project and then work backwards to what your participation looked like when you first started.

1. Background Questions
 - a. What is your day job?
 - b. How long have you edited Wikipedia (to see if there is activity outside of their current account information)
 - c. Motivation
 - i. What motivated you to participate?
 - ii. What motivates you to continue participating?
 - iii. Is your participation in anyway related to any hobbies or career your are involved with?
2. Current Participation
 - a. Please describe your most recent session editing Wikipedia. What were you working on. What tools (features of Wikipedia) did you use? Did you refer to any Wikipedia policy? Did you engage any resources outside of Wikipedia (google, library, books, conversation with friends)?
 - b. How does this compare to the work you have been doing on Wikipedia in the past month
3. Questions about current participation in specific spaces (***The following questions should be tailored based on the spaces that you see them engaging via the edit summary tool***)
 - a. Ask questions about how they characterize the use of the space as a function of their broader participation. Why do they use this space at all? How do they perceive their use of the space as having changed over time? examples of spaces that will appear in the edit summary include article talk, user talk, user profile
 - b. Do you belong to any Wikiprojects? If so, in what ways have the projects shaped the way you participate?
 - c. Have you used any of the following help portals? How did you come to use them, how have you used them, and how have they, in the broadest sense possible, shaped your work and overall understanding of contributing to Wikipedia?

- i. [Adopt-a-User](#)
 - ii. [Articles for Creation](#)
 - iii. [Teahouse](#)
 - iv. [The Wikipedia Adventure](#)
 - v. [Help Desk](#)
- 4. Current use of Syntax features and bots. How did you come to use them, how have you used them, and how have they, in the broadest sense possible, shaped your work and overall understanding of contributing to Wikipedia? Moving pages/redirects
 - a. Barnstars
 - b. Using templates
 - c. Inserting images
 - d. Citing sources (ref header, cite gadget, reflat)
 - e. Anti-vandalism tools (Twinkle, Huggle)
 - f. Snuggle (invitations)
 - g. Twinkle
 - h. Responding to and helping new editors
 - i. Answer questions on Teahouse
 - j. Using rollback/reverting changes
 - k. MediaWiki Gadgets and External tools
 - l. Advanced templates
- 5. Interaction with other users on and/or off wiki?
- 6. Do you see yourself as having a role on Wikipedia?
- 7. Current obstacles/challenges
- 8. Past Participation
 - a. How has your participation changed? describe some anecdotes of what participation was like when you first started. For example, when you started using some of the above discussed spaces or features
 - b. Do you see a difference between how you participated and how you participate now? If so, how would you describe this difference with some examples of work.
 - c. Any obstacles that you dealt with then that you don't deal with now?
 - d. People that you interacted with in any capacity that impacted your work?
 - e. Breakthrough moments/learning moments where you shifted how you do your work?

Appendix B Sample subject recruitment letter for Wikipedia

==Your experience with Wikipedia so far==

Hello [user],

I am conducting research about newcomers to Wikipedia and I was hoping to ask you some questions. I've noticed you've had some good activity recently. Is there any chance you have time in the next month to speak with me? If you are interested or have any questions, please email me at gmugar [at] syr.edu or leave a message on my [[User talk:Gabrielm199|talk page]].

I hope to be in touch soon ~~~~

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- Weinberger, D. (2011). *Too Big to Know: Rethinking Knowledge Now that the Facts Aren't the Facts, Experts are Everywhere, and the Smartest Person in the Room is the Room*. New York: Basic Books.
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- Wiggins, A., & Crowston, K. (2011). From Conservation to Crowdsourcing: A Typology of Citizen Science (pp. 1–10). Presented at the HICSS '11: Proceedings of the 2011 44th Hawaii International Conference on System Sciences.
- Wiggins, A., & Crowston, K. (2015). Surveying the citizen science landscape. *First Monday*, 20.
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- Østerlund, C. S. (2007). Documents in Place: Demarcating Places for Collaboration in Healthcare Settings. *Computer Supported Cooperative Work*, 17(2-3), 195–225.
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- Østerlund, C. S., Mugar, G., Jackson, C., Hassman, K. D., & Crowston, K. (2014). Socializing the Crowd: Learning to talk in citizen science. Presented at the Academy of Management 2014.
- Østerlund, C., Snyder, J., Sawyer, S., Sharma, S., & Willis, M. (2015). Documenting Work: From Participant Observation to Participant Tracing. In *Handbook of Innovative Qualitative Research*. Routledge.

CURRICULUM VITAE

Gabriel H. Mugar
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EDUCATION

Ph.D., Information Science and Technology, Syracuse University (Graduating May, 2017)

- Advisor: Dr. Carsten Østerlund
- Graduate Assistance in Areas of National Need Fellowship (2010-2014)
- Doctoral Thesis: "Encounters with Authority: Tactics for Managing the Periphery of Participatory Platforms"

M.A., Media, Culture, and Communication, New York University, (May, 2010)

- Advisor: Dr. Helen Nissenbaum
- Master's Thesis: "Online Architectures of Autonomy: Towards Design Values for Community Resource Websites"

B.A., Philosophy and Religion, Boston University, (January, 2004)

AFFILIATIONS

Research Affiliate, Berkman-Klein Center for Internet and Society, Harvard University (2015-2016, 2016-2017)

Design Research Consultant, French 2D Architecture PLLC (September 2013-Present)

RESEARCH INTERESTS AND SKILLS

- **Topical:** Newcomers to open online participatory platforms, expertise sharing in organizations, governance in open online collaborative communities.
- **Disciplinary:** Human-Computer Interaction, Computer Supported Cooperative Work, Science and Technology Studies, New Media and Communication Studies.
- **Theoretical:** Communities of Practice, Sociomateriality, Actor-Network-Theory, Ethnomethodology.
- **Methodological:** Ethnography (Interviews, participant observation, focus groups, analyzing traces of participant activity in open online collaborative environments), survey design.

SELECTED RESEARCH EXPERIENCE

Learning and Motivation of Zooniverse Contributors (NSF-SoCS Funded Research), Graduate Research Assistant. P.I. Carsten Østerlund (Fall 2012-Fall 2015)

- Conducted ethnographic study of newcomers to the Zooniverse suite of citizen science projects.
- Designed research process using participant observation, interviews, diary studies, focus groups, surveys, and trace data analysis of online user activity via publicly available data and data from SQL queries.
- Conducted qualitative data analysis with NViVo software and grounded theory technique. Results published and presented at refereed conferences.

The Wikipedia Co-op (Funded by Wikimedia Foundation Individual Engagement Grant), Principal Design Researcher (Spring 2014-Spring 2015)

- Conducted preliminary research on experience of new contributors to Wikipedia with existing help spaces using interviews and surveys.
- Worked with data scientists at Wikimedia Foundation to run SQL queries on newcomer behavior in help spaces.
- Developed interview and survey protocol focused on experience of newcomers to mentorship space on Wikipedia.
- Conducted data analysis with NViVo software using grounded theory techniques. Results presented in oral and written reports to Wikimedia Foundation staff.

Social Media Adoption in the Private Sector, Graduate Research Assistant. P.I. Ines Mergel (Spring 2011)

- Conducted interviews with social media managers of Fortune 500 companies about how the organization adopted social media for external facing activity.
- Generated 160 pages of transcripts. Analyzed data using NViVo and grounded theory technique. Findings published and presented at refereed conference.

TEACHING EXPERIENCE

Instructor, IST 649 Human Interaction with Computers. Syracuse University School of Information Studies Spring 2016

Teaching Assistant, Technology as Public Good IST 400/600. (Spring 2011 and Spring 2012).

SELECTED CONFERENCE PAPER PROCEEDINGS

Carsten Østerlund, **Gabriel Mugar**, Corey Jackson, Kevin Crowston “Typologies of Learning in Open Online Collaborative Communities.” In Thomas Ludwig, Karin Hansson, Michael Muller, Tanja Aitamurto, Neha Gupta (Eds.), International Reports on Socio-Informatics (IRSI), Proceedings of the CSCW 2016 – Workshop: Toward a Typology of Participation in Crowdwork (Vol. 13, Iss. 1, pp. 15-22)

- Corey Jackson, **Gabriel Mugar**, Kevin Crowston, Carsten Østerlund “Encouraging Work in Citizen Science: Experiments in Goal Setting and Anchoring” 19th ACM Conference on Computer Supported Cooperative Work and Social Computing.
- Corey Jackson, Kevin Crowston, **Gabriel Mugar**, & Carsten Østerlund (2016). "“*Guess what! You’re the first to see this event*”: *Increasing Contribution to Online Production Communities*” (pp. 1–9). Presented at the GROUP '16: Proceedings of the 16th ACM international conference on Supporting group work.
- Corey Jackson, Carsten Østerlund, Veronica Maidel, Kevin Crowston, **Gabriel Mugar**. Which Way Did They Go? Newcomer Movement through the Zooniverse. 19th ACM Conference on Computer Supported Cooperative Work and Social Computing.
- Gabriel Mugar**, Carsten Østerlund, Corey Jackson, Kevin Crowston. “Being Present in Online Communities: Learning in Citizen Science” In proceedings for the 7th Conference on Communities and Technologies, 2015. Limerick, Ireland.
- Corey Jackson, Carsten Østerlund, **Gabriel Mugar** Kevin Crowston, Katie DeVries Hassman. “Motivations for Sustained Participation in Citizen Science: Case Studies on the Role of Talk”. Proceedings of HICSS-48, Hawaii, January 5-8 2015.
- Carsten Østerlund, **Gabriel Mugar**, Corey Jackson, Katie DeVries Hassman, Kevin Crowston. “Socializing the Crowd: Learning to Talk in Citizen Science” Proceedings of the 2014 Annual Meeting for the Academy of Management. Philadelphia, Pennsylvania.
- Gabriel Mugar**, Carsten Østerlund, Katie DeVries Hassman, Kevin Crowston, Corey Jackson. Planet Hunters and Seafloor Explorers: Legitimate Peripheral Participation Through Practice Proxies in Online Citizen Science. In proceedings for the 2014 Conference on Computer Supported Cooperative Work. Baltimore, Maryland.
- Gabriel Mugar**, "A Practice Perspective on Websites for the Sharing Economy." Proceedings of the 2013 iConference, Ft. Worth, Texas.
- Katie DeVries Hassman, **Gabriel Mugar**, Carsten Østerlund, Corey Brian Jackson, "Learning at the Seafloor, Looking at the Sky: The Intersection of Individual Tasks and Collective Engagement in Two Citizen Science Projects." In Proceedings for 10th International Conference on Computer Supported Collaborative Learning, Madison, Wisconsin (June 2013).
- Ines Mergel, **Gabriel Mugar**, Mohammad Jarahi, “Forming and norming social media adoption in the corporate sector.” In proceedings for the 2012 iConference, Toronto.
- Gabriel Mugar**, “Expanding the Research Scope for Internet Enabled Neighborhood Communication Platforms.” Proceedings of the 2012 iConference, Toronto, Canada.

CONFERENCE PRESENTATIONS

- Gabriel Mugar, Andrea Wiggins, Carsten Østerlund “Citizen Science: Beyond the Laboratory” Conference Track Convener for three sessions on Citizen Science at the 2016 Annual Meeting of the Society for the Social Studies of Science. Barcelona, Spain. (August 31st-September 3rd).
- Gabriel Mugar, “Campusneighbor x Soundlogics” Panel on Civic Art and Design at the 2nd Annual Boston Civic Media Consortium Conference on Design, Technology, and Social Impact, 2016. Boston, MA.
- Gabriel Mugar “Newcomer onboarding and the production of trust in the sharing economy” Workshop on The Future of Platforms as Sites of Work, Collaboration and Trust at the 2016 ACM Conference on Computer Supported Cooperative Work. San Francisco, CA (February 27th to March 2nd, 2016).
- Gabriel Mugar “Towards a sociomaterial perspective of newcomers to online knowledge production projects” November 2015 Annual Meeting of the Society for the Social Studies of Science. Denver, CO.

Gabriel Mugar, Carsten Østerlund, Corey Jackson, Kevin Crowston “Learning and Motivation in the Zooniverse” “Advancing an industry/academic partnership model for Open Collaboration research” Workshop at the 2015 ACM Conference on Computer Supported Cooperative Work. Vancouver, BC (March 14-18, 2015)

Carsten Østerlund, Corey Jackson, Gabriel Mugar, Kevin Crowston “Technology Features and Participant Motivation” 2015 Meeting of the Citizen Science Association, February 11-12th, San Jose, CA.

Katie DeVries Hassman, Carsten Østerlund, Gabriel Mugar, Corey Jackson, Kevin Crowston “Beyond Data Management: Exploring New Roles for Librarians in Citizen Science Projects” 2015 Meeting of the Citizen Science Association, February 11-12th, San Jose, CA.

Corey Jackson, Gabriel Mugar, Carsten Østerlund, Katie DeVries Hassman, Kevin Crowston. “Experiments in Goal Setting for Citizen Science” 2014 Conference on Digital Experimentation at Massachusetts Institute of Technology. Cambridge, Massachusetts.

Carsten Østerlund, Corey Jackson, Gabriel Mugar, Kevin Crowston, Katie DeVries Hassman. Learning & Motivation in Citizen Science. Presented at 2014 AAAS Annual Meeting, February 13-16, Chicago

Gabriel Mugar and Ingrid Erickson “Big Data vs. Thick Description: Problematizing Urban Informatics.” October 2013 Annual Meeting of the Society for the Social Studies of Science. San Diego, California.

Gabriel Mugar, Dane Dell, and Michael Tubbs, "Technology as Public Good." Techno-Science as Activism Conference 2012. Rensselaer Polytechnic Institute, Troy, NY.

Gabriel Mugar, “Socialization in Open Online Communities of Production and Exchange” National Science Foundation Socio-Computational Systems Research Meeting, Seattle, WA (June, 2013)

Gabriel Mugar, "Towards a Practice Perspective of Websites for the Sharing Economy." October 2012 Annual Meeting of the Society for the Social Studies of Science. Copenhagen, Denmark.

INVITED SPEAKER/PANELIST

Symposium Speaker, “How newcomers learn to participate in crowdsourced citizen science.” Division of Clinical Informatics at Harvard Medical School, Boston, MA (December 2015)

Guest Speaker, "Introduction to the Wikipedia Community." Dr. Gilly Leshed's Course on Online Community, Cornell University, Ithaca, NY. (September 2013)

Review Panel Member, Mobile Communication Studio, Tufts University, Medford, MA. (December, 2013)

Guest Speaker, "Introduction to the Wikipedia Community." Dr. Gilly Leshed's Course on Online Community, Cornell University, Ithaca, NY. (September 2012)

Guest Speaker, "Introduction to the Wikipedia Community." Dr. David Sonnenfeld's Course on the History of Environmental Movements, SUNY-ESF, Syracuse, NY. (September 2012)

Panelist, “Community Voice and Power Politics” Syracuse University and University of Fort Hare Collaborative Colloquium at the Maxwell School of Public Policy. (September 2011)

Presenter, “Citizen Grammar Project and Technology as Public Good Course.” Presented to the Program for the Advancement of Research on Conflict and Collaboration at Maxwell School of Public Policy. (October 2010)

Review Panel Member, Social networking and Architecture, Syracuse University School of Architecture. (October 2010)

Review Panel Member, Situated Technologies Group, University of Buffalo. (December 2010)

Guest Speaker, “Mashups.” Comprehensive Studio at Syracuse University School of Architecture. (January 2010)

United States Chapter Representative, Wikimedia Global Chapters Meeting. Berlin, Germany. (April 2010)

Guest Speaker, “The Role of Press Pass TV in the Community.” Media and Public Service course at Tufts University Tisch School of Citizenship. (April 2006)

SELECTED WORKSHOPS

Selected Participant, “The Future of Platforms as Sites of Work, Collaboration and Trust at the 2016 ACM Conference on Computer Supported Cooperative Work. San Francisco, CA (February 27th to March 2nd, 2016).

Selected Participant for The Consortium for the Science of Sociotechnical Systems (CSST) 2015 Summer Research Institute. Colorado Springs, CO (July 20-24, 2015)

Selected Participant, “Advancing an industry/academic partnership model for Open Collaboration research” Workshop at the 2015 ACM Conference on Computer Supported Cooperative Work (CSCW 2015). Vancouver, BC (March 14-18, 2015)

Selected Participation, National Science Foundation Socio-Computational Systems Doctoral Symposium, Seattle, WA (June 2013)

Invited Participant, "Workshop on the Evaluation and Management of Open Online Communities" Syracuse University (July 2012)

Invited Participant, “Open Design for Organizational Innovation Workshop,” Funded by National Science Foundation; Part of the "Design Collaboration as Sociotechnical Systems," research project at Cornell University. (November 17th 2011)

Invited Guest, “1st Annual Wikipedia in Higher Education Conference.” Simmons College. (July 7-9, 2011)

AWARDS/GRANTS

Wikimedia Foundation Individual Engagement Grant, 2014. \$22,600

Finalist, 2012 Ray Von Dran IDEA Award, Syracuse University

Exploratory Conference Grant 2012 \$300, Syracuse University School of Information Studies

Summer Research Funding 2012 \$3,600, Syracuse University School of Information Studies

APPLIED RESEARCH EXPERIENCE

Exhibiting Artist and Design Researcher with Anda French, “CampusNeighbor+Soundlogics” Installation and community website facilitating bartering between students and residents in Syracuse, New York. Group show, “Getting To Know You: Artists Examine Authentic Connections in the Digital Age,” 601 Tully: Center for Engaged Art and Research, Syracuse, New York. (January 26th-April 26th 2014).

Design Researcher, Reimagining Mentorship in Wikipedia (2014)

Design Research Consultant, Office space work study for French2Design (2014)

Consultant, Finalist design by French2Design for Museum of Modern Art Young Architects Program (2013)

User Experience Consultant, Information Needs in Bartering Transactions on Ourgoods.org (2012)

SERVICE TO PROFESSION

Reviewer, CSCW 2013,2015-2017 (Recognized for outstanding review in 2015)

Reviewer CHI 2016, 2017

Reviewer, iConference 2014, 2016

Reviewer, Academy of Management Annual Meeting 2014

Reviewer, New Media and Society 2013-2014

Reviewer Journal of the Association for Information Science and Technology 2015

Reviewer Journal of Librarianship and Scholarly Communication 2015

Reviewer The Information Society 2015

SERVICE TO SYRACUSE UNIVERSITY

Syracuse University School of Information Studies Personnel Committee (2013-14)

Syracuse University School of Information Studies Doctoral Committee (2011-12)

Organizer, Ines Mergel Talk for IST 810/840 Syracuse University (2012)

Organizer, Panel on social media in academia for IST 810/840 Syracuse University (2013)

Organizer, PhD program breakfast with Steve Ressler, Founder of GovLoop (2012)

PROFESSIONAL EXPERIENCE

Founder and Co-Director, Press Pass TV Inc. Boston, MA. January (2004-2010)

Television Production Teacher, Madison Park Technical Vocational High School, Boston, MA. (2006-2008)

Segment Producer, Current TV Inc. San Francisco, CA. (2005-2008)

COMMUNITY SERVICE

Chairman, Press Pass TV Inc. (2010-2011; 2014-Present)

Advisory Board, Press Pass TV Inc. (2012-2014)