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#commoncore Project: How Social Media Is Changing the Politics of Education

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#commoncore Project: How Social Media Is Changing the Politics of Education

Abstract

The Common Core has become a flashpoint at the nexus of education politics and policy, fueled by ardent social media activists. To explore this phenomenon, this innovative and interactive website examines the Common Core debate through the lens of the influential social media site Twitter. Using a social network perspective that examines the relationships among actors, we focus on the most highly used Twitter hashtag about the Common Core: #commoncore. The central question of our investigation is: How are social media-enabled social networks changing the discourse in American politics that produces and sustains social policy? To join a conversation about this research in an open forum, tweet using #htagcommoncore.

Disciplines

American Politics | Education | Education Policy | Politics and Social Change | Social Influence and Political Communication | Social Media

Comments

See the interactive [#commoncore website](#) for more information.

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CONSORTIUM *for* POLICY RESEARCH *in* EDUCATION

#COMMONCORE

How Social Media is Changing
the Politics of Education

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About the Consortium for Policy Research in Education

The Consortium for Policy Research in Education (CPRE) brings together education experts from renowned research institutions to contribute new knowledge that informs PK-16 education policy and practice. Our work is peer-reviewed and open-access at cpre.org. CPRE's member institutions are the University of Pennsylvania; Teachers College, Columbia University; Harvard University; Stanford University; University of Michigan; University of Wisconsin-Madison; and Northwestern University.

ABOUT THE AUTHORS



Jonathan Supovitz is a Professor of Education Policy and Leadership at the University of Pennsylvania's Graduate School of Education and Co-Director of the Consortium for Policy Research in Education (CPRE). He holds a B.A. in History from the University of California at Berkeley; a master's degree in Public Policy from Duke University, and a doctorate in Education Policy from Harvard University. He is an accomplished mixed-method researcher and evaluator and has published findings from numerous educational studies and evaluations of school and district reform efforts. He has presented his work both nationally and internationally on state and local policy design and implementation; school leadership development and practice; data use and continuous improvement initiatives; classroom formative assessment practices; and state and district test-based accountability policies. He has been a lead and co-investigator of numerous federal and foundation sponsored research projects. He is also a member of the committee revising the Interstate School Leaders Licensure Consortium (ISLLC) Standards. He directs the Evidence-Based Leadership strand of the Mid-Career Educational Leadership Program at the University of Pennsylvania. Supovitz recently concluded a four-year study of district Common Core policy design and school implementation in the New York City schools. He is currently leading a large-scale evaluation of a formative assessment initiative in the School District of Philadelphia.



Alan J. Daly is Professor and Chair of the Department of Education Studies at the University of California, San Diego. He graduated from Clark University with a Bachelors of Arts in Psychology, received a Masters of Science in Counseling from San Diego State University, and a Master of Arts and Ph.D. in Education with an emphasis in Educational Leadership and Organizations from the University of California, Santa Barbara. Prior to coming to the university, Daly had over 15 years of public education experience in a variety of positions ranging from classroom teacher to district psychologist to site administrator, providing him with a solid grounding in the world of practice. Daly has presented at the local, state, national, and international level regarding his research and practical work in organizational learning, policy implementation, social networks, and educational reform. His research and teaching primarily focuses on social network theory and analysis, leadership, educational policy, and evidence use.



Miguel del Fresno is a senior marketing and communication consultant and researcher in social network analysis and netnography. He is a professor in the Masters of Communication program at UPV (Bilbao), UPV (Valencia), UAB (Barcelona), UCM (Madrid), and University of Sevilla, Jaume I (Castellón) in Spain, as well as a visiting professor at University of Valparaíso (Chile) and University of the Republic of Uruguay (Montevideo). He is a visiting researcher at the University of California, Berkeley; University of California, San Diego; and the University of Potsdam (Germany). Del Fresno earned an MBA and an Executive Masters in e-Business from IE Business School (Madrid), as well as a Masters in Information Society and Knowledge (Universitat Oberta de Catalunya) and a Ph.D. in Sociology (Universidad Nacional de Educacion a Distancia). He is a founding member of casadelibro.com and has worked professionally as the Director of Marketing and Communications for Elsevier Spain and Casa del Libro.

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PROLOGUE

The Common Core has become a flashpoint at the nexus of education politics and policy, fueled by ardent social media activists. To explore this phenomenon, this innovative and interactive website examines the Common Core debate through the lens of the influential social media site Twitter. Using a social network perspective that examines the relationships among actors, we focus on the most highly used Twitter hashtag about the Common Core: #commoncore. The central question of our investigation is: How are social media-enabled social networks changing the discourse in American politics that produces and sustains social policy? To join a conversation about this research in an open forum, tweet using #htagcommoncore.

ABOUT THE #COMMONCORE PROJECT

In the #commoncore Project, authors Jonathan Supovitz, Alan Daly and Miguel del Fresno, examine the intense debate around the Common Core State Standards education reform as it played out on Twitter. The Common Core, the major education policy initiative of our generation, seeks to strengthen education systems across the United States through a set of specific and challenging education standards. Once enjoying bipartisan support, the controversial Standards have become the epicenter of a heated national debate about this approach to educational improvement. By studying the Twitter conversations about the Common Core, we shed light on the ways that social media-enabled social networks are influencing the political discourse that, in turn, produces public policy.

The Rise of Social Media-Enabled Social Networks

We live amidst an increasingly dense technology-fueled network of social interactions that connects us to people, information, ideas, and events which together inform and shape our understanding of the world around us. In the last decade, technology has enabled an exponential growth of these social networks. Social media tools like Facebook and Twitter are engines of a massive communication system in which a single idea can be shared with thousands of people in an instant.

Twitter, in particular, represents a compelling resource because it has become a kind of “central nervous system” of the Internet, connecting policymakers, journalists, advocacy groups, professionals, and the general public in the same social space. Twitter users can share a variety of media including news, opinions, web links, and conversations in a publicly accessible forum.

In this project we use Twitter to analyze the intense debate surrounding the Common Core State Standards. The Common Core has consistently generated a high volume of activity on Twitter. Hashtags (#) are used on Twitter to mark keywords or topics of interest to users, and one hashtag in particular, #commoncore, has consistently generated 30,000-50,000 tweets a month. While topics tend to trend and fall on Twitter, #commoncore has

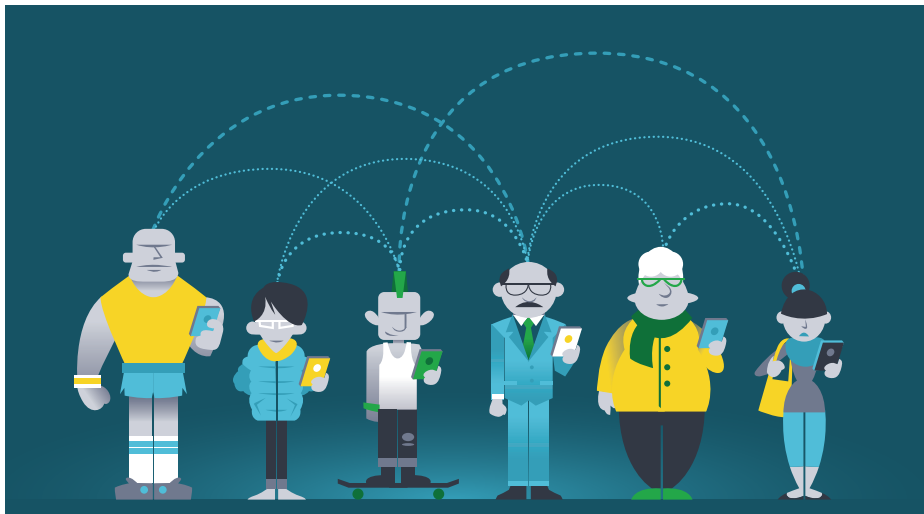


consistently maintained this volume of activity over the past 18 months and continues to be the most prevalent marker of conversations about the Common Core State Standards education reform.

consistently maintained this volume of activity over the past 18 months and continues to be the most prevalent marker of conversations about the Common Core State Standards education reform.

Social Network Analysis Makes the Invisible Visible

To understand the #commoncore network, we use *social network analysis* as a lens to explore the ways that social media—enabled social networks are influencing the political discourse that produces public policy.



The powerful thing about social network analysis is that it *makes visible* the patterns of communication in social networks that are otherwise invisible to either those interacting within the networks or those observing them from the outside.

Regardless of whether they are networks of neighbors talking across backyard fences or friend networks on Facebook, social networks are mostly invisible to the naked eye, similar to the way in which television signals are always flowing above and around us but we are generally oblivious to their presence. Despite being unseen, the ideas and messages transmitted via social media like Twitter can be very consequential in terms of the type,

accuracy, and novelty of the information that is being broadcast, and *with whom* it is being shared. These sources help form our beliefs and opinions, and it is these convictions upon which our actions are based.

How Our Story Is Organized

The story of the #commoncore communication system is organized into a prologue, four acts, and an epilogue:

The **Prologue** is designed to give you a broad context for our investigation of the Common Core on Twitter. It includes this introduction to the project, as well as sections on *the evolution of media in politics* and *the history of standards based reform*. It also includes a short primer on *the theory of social capital*, which is the concept underlying the importance of social networks. The prologue also includes a short overview of *how Twitter works* for those unfamiliar with the social media tool.

Act 1 focuses on **The Social Network** and its subgroups. The act begins with a short overview of the data we analyzed for the project. We then introduce you to the giant #commoncore network and *structural communities* that are formed by their patterns of activity on Twitter. The structural communities are not our interpretation of the data, but are based upon actors' actual choices and behavior on Twitter. The members of these subgroups have distinct characteristics and tend to share similar beliefs and opinions. We also introduce two types of influential actors on Twitter, *transmitters*, who send lots of tweets, and *transceivers*, whose messages are deemed so important that their communications are frequently re-sent and mentioned by others.

Act 2: The Players introduces the particular key individuals and organizations in the #commoncore network. These include:

- The individuals who compose the *Transmitter network*, or those who send lots of tweets using #commoncore.
- The individuals who comprise the *Transceivers network*, or those whose tweets are frequently retweeted or mentioned by others, giving them a different kind of influence in the #commoncore network.
- The *Transcenders*, who are both high-frequency transmitters and transceivers. In the #commoncore network, these actors are the elite of the elite.

Each of these types of players has an important role in the overall communication system. Their patterns of behavior offer insights into both the overall structure of the communication network and their positions within it.

Act 3: The Chatter hones in on the specific content of the #commoncore tweets of the key individuals introduced in Act 2. This act provides insight into the *politics, opinions, and goals* of the members of the network through analysis of the *political language* and *metaphors* they use in their #commoncore tweets.

Act 4: The Motivations delves into the passions and deeply held beliefs of a small sample of prominent actors in the #commoncore network. It features *audio interviews* with some of the players, spotlighting their arguments for or against the Common Core as well as the motivations behind their social advocacy.

The **Epilogue** distills the big takeaways from our exploration. It includes a *summary of the key findings* and essays about the meaning of the findings. Jonathan Supovitz's essay examines *the rise of crowd-sourced political influence represented by the #commoncore phenomenon*. Alan Daly considers larger questions of *the role of social space in public debate*. And Miguel del Fresno writes about *the ongoing innovative disruption of social media*.

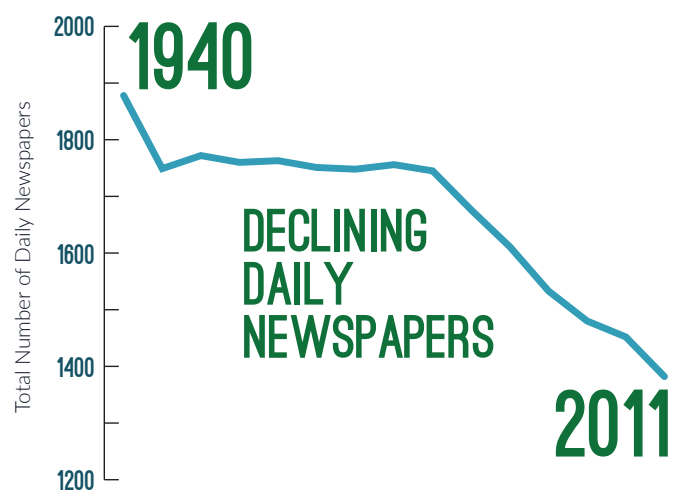
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THE EVOLUTION OF MEDIA IN POLITICS

The role of the media in shaping political opinion has changed dramatically over the past 60 years, as the populace has grown both more sophisticated and more fragmented. Before World War II, radio and newspapers were the dominant forms of mass communication.

Franklin Roosevelt's famous fireside chats were a central means of messaging, and newspaper circulations were at an all-time high. In the 1950s, researchers Paul Lazarsfeld and Elihu Katz observed that mass media influenced opinion leaders, who in turn influenced their followers, the general public (1955). They called this process the *two-step flow model* to indicate that public opinion was developed through a cascading process.



SOURCE: NEWSPAPER ASSOCIATION OF AMERICA

As network television became more dominant in the 1960s and 70s, the three major networks—CBS, NBC, and ABC—molded public perceptions to an unprecedented degree in what became known as **agenda setting**. In one famous study that was replicated many times, McCombs and Shaw (1972) demonstrated the overwhelming alignment between what residents in Chapel Hill, North Carolina, thought were the most important election issues of the day and what the news media reported were the most important issues. The public depended heavily on the three dominant networks to stay abreast of national and international news, and because of this, the media had tremendous influence in molding public opinion.

Proliferation of Media Outlets

With the advent of cable television in the 1980s, the proliferation of channels led to a fragmentation of audiences. Cable news, talk radio, and 24-hour all-news outlets competed for attention with increasingly brazen and partisan reporting. The wide array of available media choices caused audiences to increasingly fracture as people tended to avoid information that diverged from their world view, instead seeking out information that was consistent with their



preexisting attitudes and beliefs (Mutz, 2006). In this context, it is not hard to see why many political scientists have argued that the expansion of available news sources has increased political polarization (Bennett & Iyengar, 2008).

In today’s media landscape, the Internet and social media sites such as Twitter and Facebook provide even more opportunities for audiences to splinter as members with similar views have increasing access to each other. And there are some distinct differences between the media landscape at the end of the last century and the social media era we are in today. The growth of cable television in the 1980s and 1990s was still essentially unidirectional from “elites” to general audiences because of the content control of mass media and passive forms of viewing. Social media, however, allows members to actively voice their opinions and engage directly with each other.



Some researchers, including Valenzuela, Park, and Kee, view social media as a new

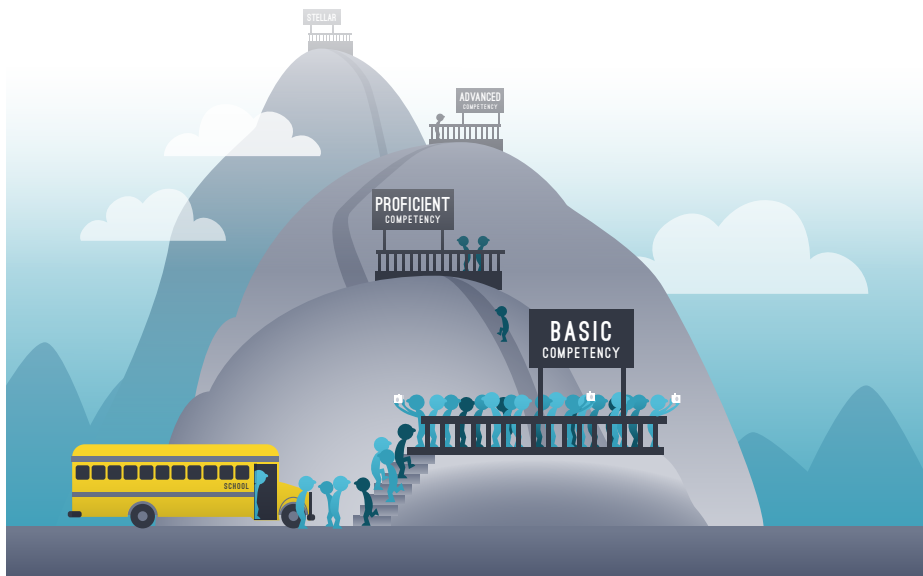
opportunity for political participation, free flow of information, and broader democratic mobilization (2008). Others, like Roodhouse, view social media sites as nothing more than discursive information flows and echo chambers where the fervent can shout with each other (2009).

Thus, Twitter is in many ways the perfect platform for examining the ways in which social media are influencing the Common Core conversation in the United States. Twitter is a free, online, and global communication network that combines elements of blogging, text messaging, and broadcasting. One of the most valuable aspects of Twitter is its evolving nature to be, “a media of intersection of every media and medium” (Dorsey, 2012).

THE RECENT HISTORY OF STANDARDS REFORM IN AMERICA

The Common Core State Standards in mathematics and English language arts were developed at the behest of the group of organizations led by the National Governors Association (NGA) and the Council Chief State School Officers (CCSSO). The Standards set forth what students should know and be able to do in mathematics and English language arts at each grade level. The development of these standards began in 2009, but they are part of a history of several decades of education reform.

1980s: Focus on Minimum Competency Testing

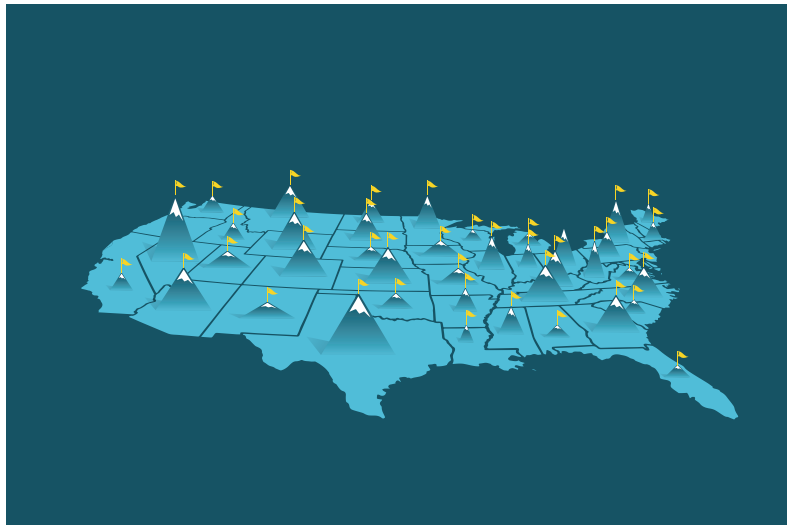


In the 1980s, policymakers created a set of **minimum competency tests**, which they intended schools to use as a *foundation for performance*. The expectations codified in the tests focused on a set of basic skills that schools were expected to have all students meet. However, the basic expectations assessed through the

minimum competency tests often became the aspirations for instruction. The important lesson from this era was that low expectations produced low performance.

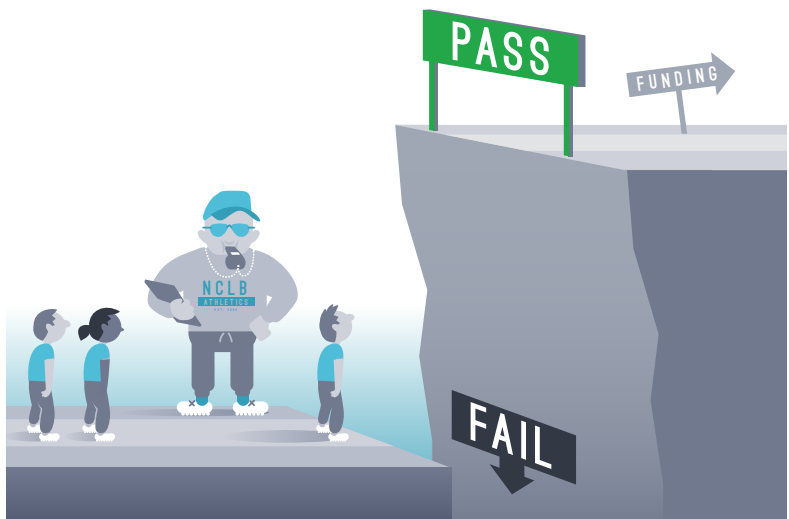
1990s: Statewide Systemic Reform

The apparent “race to the bottom” phenomenon spurred by minimum competency testing led to an emphasis on high expectations. The systemic reform effort of the 1990s was built around three general principles. First, ambitious standards developed by each state would provide a set of targets of what students ought to know and be able to do at key grade junctures. Second, states measured progress toward standards by developing aligned assessments that combined rewards and sanctions for holding educators accountable to the standards. The third component was local flexibility in organizing capacity to determine how best to meet the academic expectations (Smith & O’Day, 1991). This structure of clear goals (standards), measures (assessments), and incentives (accountability) at the state level, combined with implementation autonomy fit with our historical conceptions of education as a local effort. This led each state to develop its own standards and assessment systems, which produced lots of variation in the quality and rigor of state educational systems across the country.



2000s: Test-Based Accountability

The 2000s gave rise to the era of test-based accountability in education. The 2001 passage of the No Child Left Behind (NCLB) Act inaugurated an expansion of testing by requiring states that received federal funding to assess students in all grades between third and eighth, and one year in high school. NCLB pressed states to develop plans to have all schools make adequate yearly progress with a target of 100% proficiency by 2014—an endeavor that would prove to be impossible. The NCLB legislation also required states to disaggregate school results by subgroups, in an effort to prevent districts and schools from hiding disparities in performance within overall averages. This movement



can be seen as an attempt to tighten the linkages in the theory of standards-based reform by increasing student performance expectations via high-stakes testing to hold schools accountable for meeting standards.

Research on schools pressed by test-based accountability showed both productive and unproductive responses. There was an increase in attention to tested subjects, a rise in test preparation behavior, more attention to students just at the cusp of passing the test, and greater attention to heretofore marginalized students (Hamilton, 2003).

Some states also gamed the system by creating tests that most students could easily pass. There were also several cases of systematic cheating by educators in school districts and schools that made national headlines. The accountability emphasis of No Child Left Behind left many policymakers convinced that although pressure was important, we couldn't just squeeze higher performance out of the system—we had to build a structure to support it.

2010s: “Common Core State Standards”

This brings us to the present major reform initiative in the United States—the Common Core State Standards (CCSS). The CCSS set forth what students should know and be able to do in mathematics and English language arts at each grade level from Kindergarten to 12th grade. In a remarkable moment of bi-partisanship, the CCSS were adopted by the legislatures in 46 states and the District of Columbia in 2010. Alaska, Texas, Virginia and Nebraska did not adopt the Common Core, preferring their own state standards. Minnesota adopted the Common Core ELA standards, but not those in mathematics. Since

then, the CCSS have become remarkably political and several states have either backed away from the CCSS and/or the associated tests or are in the midst of heated discussions about their involvement with the CCSS.

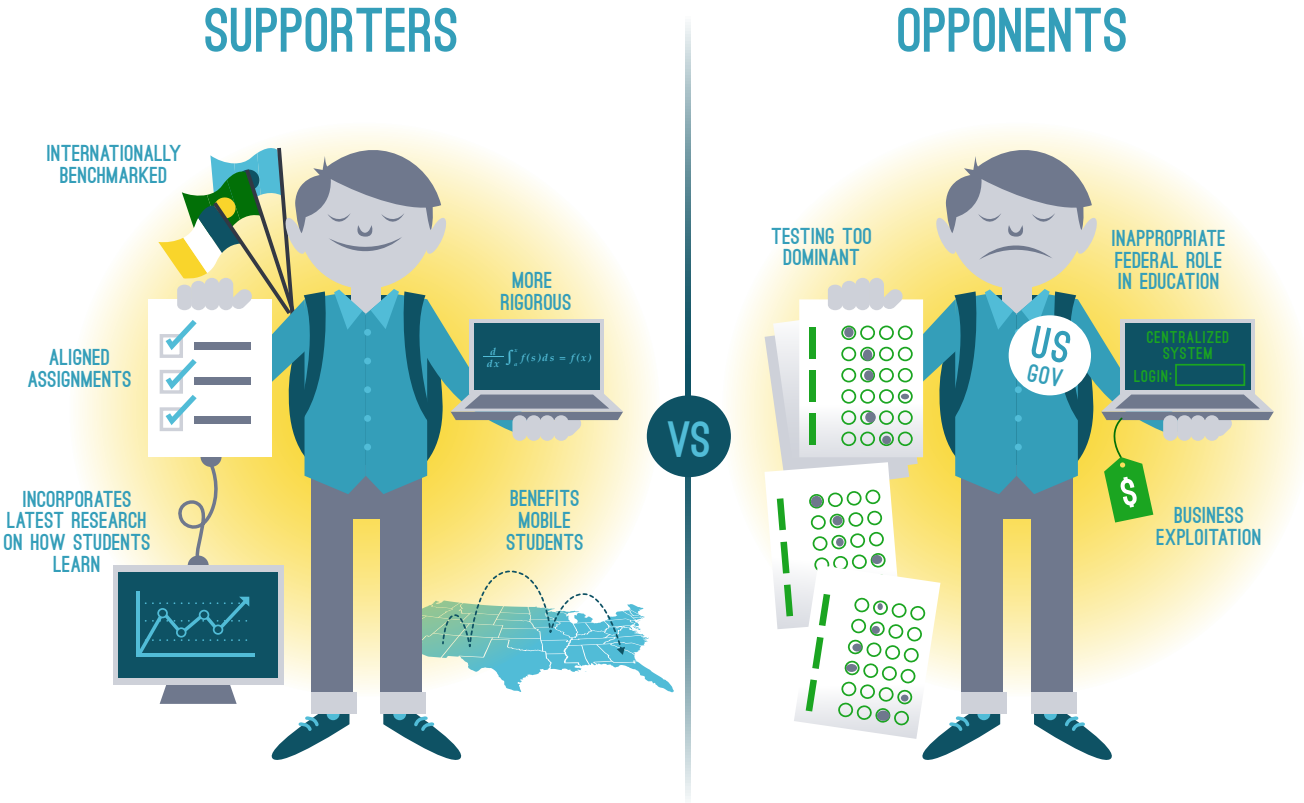
The CCSS incorporate a number of lessons learned from the earlier standards-based reform movement. The new

standards were named the “Common Core” because they were intended to eliminate the variation in the quality of state standards experienced in the past. The experience of the 1990s taught us that not all standards are equal. The new experiment with *common*



state standards was done to avoid the previous problem of differing quality of standards and their accompanying student assessments. They were developed at the behest of the state governors and chief state school officers to avoid the charge of federal intrusion—which came nonetheless after the Obama administration advocated for standards in the Race to the Top funding competition and provided the financing for the Common Core testing consortia. Similarly, the Common Core testing consortia of Smarter Balanced and Partnership for Assessment of Readiness for College and Careers (PARCC) were funded to create assessments aligned with the standards. Thus, there was a push for a uniform set of standards and the development of aligned assessments to build a more coherent system for educational improvement.

In sum, many factors led to the development of the Common Core State Standards. Ever since the *Nation at Risk Report* of 1983, which famously stated “the educational foundations of our society are presently being eroded by a rising tide of mediocrity that threatens our very future as a Nation and a people,” we have felt our education system besieged (Gardner, Larsen, Baker, & Campbell). Flat longitudinal performance on the National Assessment of Educational Progress (NAEP) and middling performance on international comparative assessments like TIMSS and PISA has further perpetuated the belief that America needs a more rigorous education system to compete with other nations in the increasingly global economy. This middling performance is often partly attributed to the spiraling nature of what is taught in America’s schools, a student experience that has been called “a mile wide and an inch deep” (Schmidt et al., 2001).



Thus, the Common Core represents the latest response to the challenge of educational improvement by incorporating the lessons learned from prior experiences with education reform. The minimum competency era taught us that we needed high expectations for all students. The state-wide systemic reform movement of the 1990s taught us that state-led standards and testing systems would produce too much variability in quality and alignment. The decade of experimentation with test-based accountability drove home the lesson that, while accountability pressure was important, we couldn't just squeeze higher performance out of the system without a coherent infrastructure to support it. All these factors have led to the push for a more comprehensive system with a uniform set of standards and aligned assessments that would allow for consistency in an increasingly mobile society.

THEORY OF SOCIAL CAPITAL

A Relational Perspective

This project is based on the fundamental idea that connections and ties between individuals create a larger network, and that this network is important to outcomes at both the individual and collective level. Ideas, opinions, and information that flow through these ties can be influential and impact behavior.

This idea is grounded in **social capital theory**, which posits that individuals exist in a social structure of relationships. This structure of relationships facilitates or inhibits an individual's access to both physical and intellectual resources such as knowledge, ideas, and opinions. Social capital theorists consider the richness of a social network to be a key component of a group's social capital, which refers to the kinship, trust, and goodwill that provides a collective advantage to the community (Coleman, 1990).

Sociologist Robert Putnam has chronicled the social benefits of memberships in organizations such as churches, clubs, and more (1995). He hypothesized that the benefits he observed were due to the connections that these groups offer to their members. In another famous example of the importance of social capital, Mark Granovetter found that extended ties even beyond one's tight-knit circle of friends helped people gain access to job opportunities (1973).

Historical Grounding

The most explicit and earliest network approach to society dates back to German sociologist Georg Simmel (1858-1915) who wrote, "Society exists where a number of individuals enter into interaction," and the object of study "was no more and no less than the study of the patterning of interaction" (as cited in Freeman, 2004).

Contemporary social network analysis was formalized in the 1930s with the work of Jacob Moreno, who studied runaway girls and argued

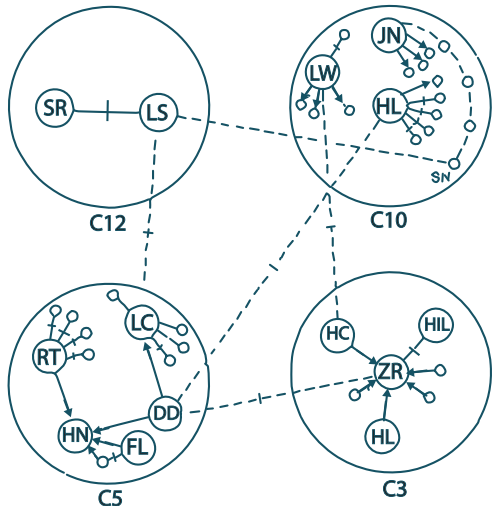
“ A collection of human beings...becomes a society only... **when one individual has an effect, immediate or mediate, upon another...** If there is to be a science whose subject matter is society and nothing else, it must exclusively **investigate these interactions.** ”

GEORG SIMMEL

that their behavior was influenced by the social links among them (1934). Moreover, the girls themselves may not have been consciously aware of how their actions were socially influenced and how, ultimately, it was their position in a social network that may have affected the runaway behavior. This idea is still prominent today and has expanded to the idea that social influence can impact a host of behaviors—both consciously and unconsciously—from happiness to weight gain to access to career opportunities.

Moreno’s early drawings of the cabins in which the runaway girls stayed and the relationships among the girls were some of the earliest depictions of social networks. The larger circles are cabins and the smaller circles depict the initials of runaway girls. The lines represent connections between girls. This was one of the earliest sociograms is an example of state-of-the-art infographics from the 1930s.

Thus, a core idea of the work running from Simmel to Moreno to Coleman to Putnam is the importance of social networks, which reflect the overall structure of small and large societal relationships. This idea comes with some basic assumptions.



Moreno’s sketch of the cabins of runaway girls.

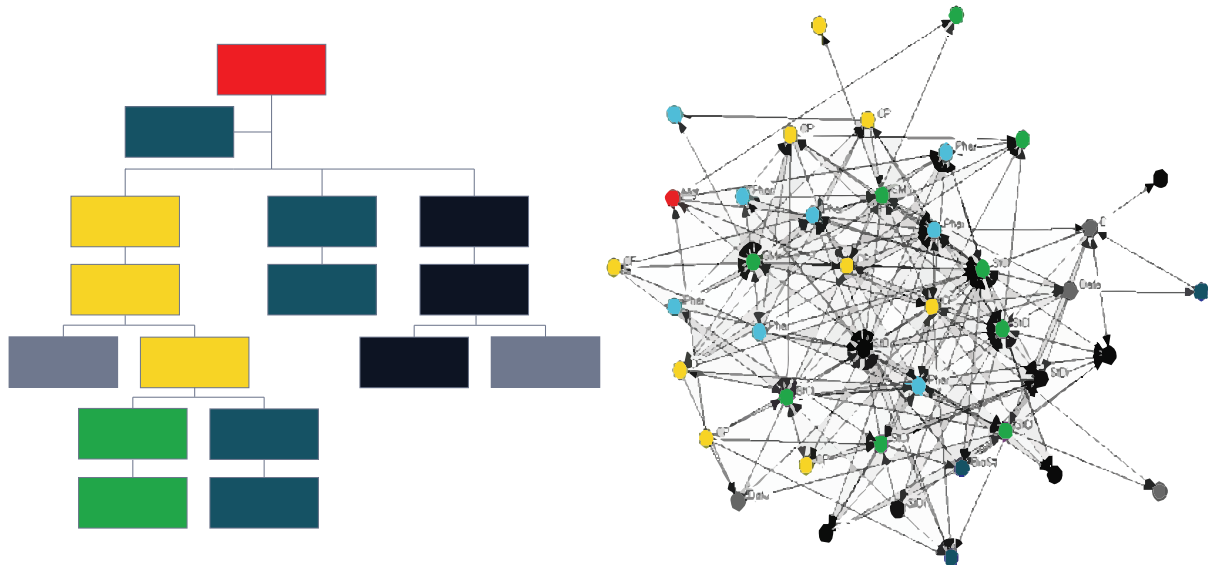
Assumptions Underlying the Social Network Perspective

There are a few core theoretical underpinnings to a social network perspective including:

1. Actors in a network are assumed to be interdependent rather than independent
2. Relationships are regarded as conduits for the exchange or flow of resources and influence.
3. The robustness and structure of a network has influence on the resources that flow to and from an actor and across a network.
4. Patterns of relationships present dynamic tensions as these patterns can act as both opportunities and constraints for individual and collective action.

This approach privileges the structure of relationships to hold more sway than the attributes of individual actors. For our work, we start with a structural perspective and then add individual attributes and perspectives. Let's look a bit more into what a network can illuminate.

Comparing Formal and Informal Networks



One of the most interesting aspects of social networks is the ability to compare and contrast the formal structure of relationships—meaning how things are formally structured versus how people actually interact. Sometimes, formal professionals are less important in social networks while unofficial individuals are central. In this example, a central player (large red box) in the formal system (left) is at the top of the hierarchy, yet in the informal social structure (right) this actor is marginalized (average-size red dot). Social network analysis can sometimes make the invisible visible.

Networks are Everywhere



Networks are intuitive and show up in many aspects of our lives. They may be structural, like subway systems or computer connections, or social, like relationships with our friends, church members, sports teams, parent groups, or colleagues.

From a social network perspective, individuals or organizations can have relationships that are depicted by lines connecting them, called **ties**. These ties can be uni-directional (going in one direction or the other) or bi-directional.

Ties that go out (i.e. are sent) from one actor to another are called out-ties and ties that come in (i.e. are received) are referred to as in-ties. Ties can sometimes be reciprocated. These can be seen in the informal social structure graphic above.

The size of the circle that represents each individual, called a node, reflects the magnitude of the resource of that individual or group. Some actors have more “importance” in the network, meaning they have more incoming or outgoing ties in comparison to others. Other actors are more peripheral and others are even entirely disconnected from the network (called isolates).

Central Actors

The major actors in a network are considered central because they have more connections than others. These individuals therefore amass disproportionately more resources through unique social links and, therefore, may have undue influence over a network.

Research suggests that these actors also have access to novel and diverse resources, allowing them the possibility to guide, control, and determine the flow of resources to others in a group (Daly, Finnigan, Moolenaar, & Che, 2014). In this sense, they often disproportionately dominate what information and opinions get moved across a network.

In this project we are most interested in those individuals who occupy a central location in a network, as central actors have been shown to influence other actors and interactions in a social sphere. We are specifically interested in actors who transmit a high number of messages to central actors in the network. We call these individuals *transmitters*. We are also interested in those actors who both receive and relay a large number of messages to others in the network. We call these individuals *transceivers*. Both of these types of central actors are important in understanding how resources flow in a network.

Other Actors in the Network

Although our project focuses on central actors, it is also important to consider how those central actors may influence others in the network who are considered more peripheral. More peripheral actors are typically engaged in fewer interactions and, as such, may have limited access to resources and tend to have less influence over the larger network. The perspectives of peripheral or isolated actors may not be as readily spread across a network and information may take longer to make it their way.

HOW TWITTER WORKS

Founded in 2006, Twitter is one of the top 10 most-visited websites on the Internet, with over 645 million users worldwide. Twitter is often called a micro-blogging social network site, where users can sign up for free, display recognizable user profiles, share messages with those who chose to follow them, and receive the messages of those they follow.

Twitter users are a special breed of communicators—they represent only 18% of Internet users and 14% of the overall adult population. According to Pew Research from 2014, they are more affluent, younger, and more ethnically diverse than the general population (Smith, Rainie, Shneiderman, & Himelboim).

Each Twitter message can contain not more than 140 characters, including spaces, which is exactly the number of characters in this sentence. While some view the brevity of tweets as a shortcoming of the medium, others view the minimal effort as an advantage (Zhao & Rosson, 2009). Additionally, given the concise nature of the medium, Twitter users get quite creative with the construction of their tweets, and often link people to other Internet locations, including articles, blogs, and other websites.

Communicating with Twitter

An important feature of Twitter is the way that the medium is designed for people to communicate. Twitter users can follow others on the medium, be followed, or have a reciprocal relationship.

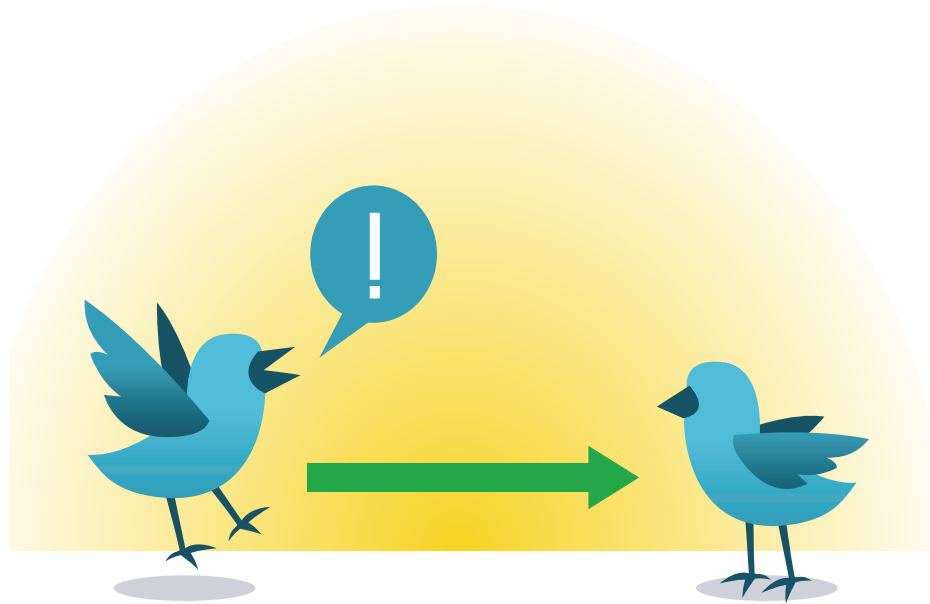
Twitter users can send their messages in three ways. First, they can initiate messages, called **tweets**. Second, tweets can be further disseminated when recipients repost them through their account. This technique, called **retweeting**, refers to the verbatim forwarding of another user's tweet. A third type of messaging is a variant of tweeting and retweeting, called **mentioning**. Mentions include a reference to another Twitter user's username, also called a handle, denoted by the use of the "@" symbol. Mentions can occur anywhere within a tweet, signaling attention to that particular Twitter user. All three of these approaches are powerful because they can introduce information to new audiences (Boyd, Golder, & Lotan, 2010).

Conversations are facilitated by preceding a tweet with the '@' sign and a user's name (i.e. @BenFranklin). Such messages are not private, but can only be seen by those who have reciprocal relationships (i.e. are following and followed) by both the sender and receiver of the targeted tweet. If, however, the @ is preceded by a period (.@), the conversation is visible to all members of either parties network.

Hashtags

Twitter users employ the hash or pound sign (#) to identify, or tag, messages about a specific topic. Twitter streams are searchable by hashtag, which is the basis for our research on the #commoncore.

Followers and following



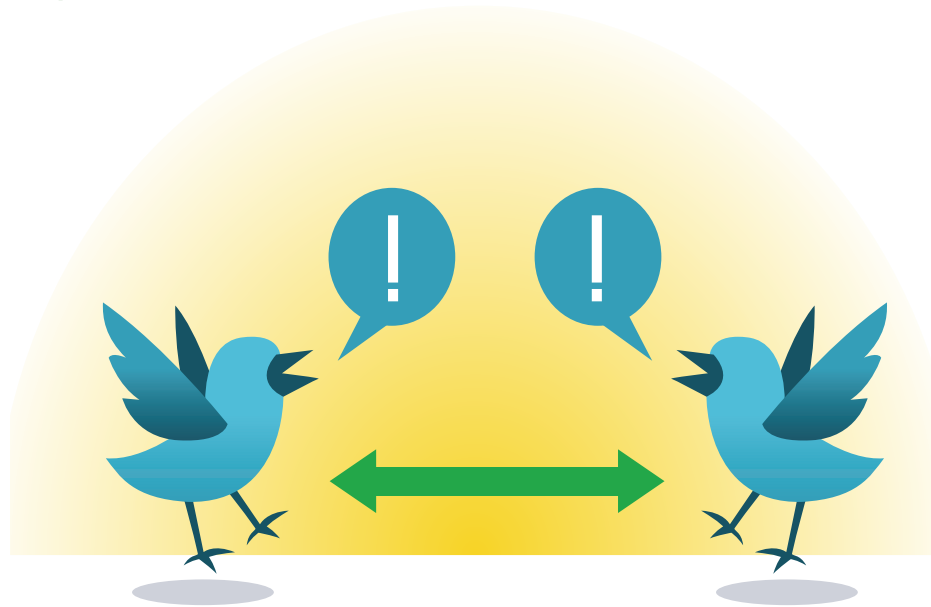
An important distinction on Twitter is the directionality of messaging. Some users are primarily senders, or **transmitters**, of messages. These transmitters are influential if they have many followers who receive their messages. Some people, like celebrities and politicians, are transmitters who are followed by many people, but follow relatively few others.

Other Twitter users are primarily followers, or **receivers**, of messages. These followers are recipients of tweets, but do not share this information.

Still other Twitter users are **transceivers**, both senders *and* receivers of messages. These individuals are the audience to some and the main attraction to others. These individuals gain their influence as conduits in the flow of information.

In our analyses, we are primarily interested in transmitters and transceivers.

Reciprocity



Twitter can be used in ways that are both uni-directional and bi-directional.

If two individuals follow each other, they both receive each others' tweets. This creates a reciprocal relationship.

Information contained in Tweets

Tweets can be used to:

- Share information or news
- Express opinions
- Provide links to other web sources
- Carry a conversation

Another dimension to consider when studying the Twitterverse is the accuracy of the information that is disseminated. Because posts are self-policed, there is no external check on the veracity of data one receives on Twitter. A study of news headlines by Schmierbach and Oeldorf-Hirsch found that headlines presented on Twitter were significantly less credible than the same headline on the news sites themselves (2012). Other studies have shown that most Twitter messages regarding news events are accurate, but the medium is also used to spread misinformation and false rumors, often unintentionally (Castillo, Mendoza, & Poblete, 2011). In such an environment, the reputation of the sender of the message is a crucial component of its perceived credibility.

THE SOCIAL NETWORK

ACT 1

A major theme of this project is that networks exist everywhere, in both the physical and social worlds. While physical networks are more readily visible, social networks influence the information we receive and operate simultaneously at different strata in peoples' personal, professional, and communal lives. Social network analysis makes heretofore-invisible relationship networks more readily apparent, and Twitter provides a bounded structure which facilitates an analysis of the communication pathways about important topics like the Common Core. In this act we introduce our dataset, examine the giant #commoncore network formed on Twitter, identify three structural communities that emerge from of the network, and introduce two types of influential twitter actors, transmitters and transceivers.

THE #COMMONCORE DATASET

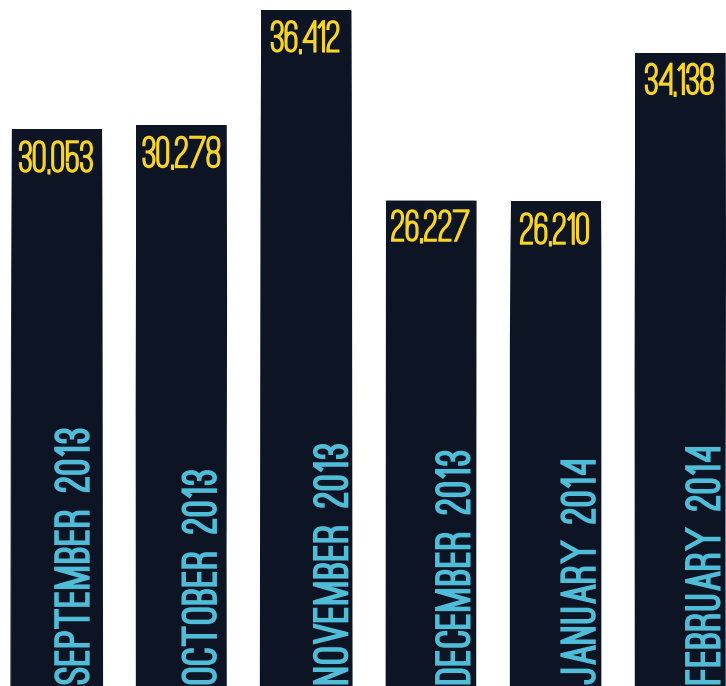
The primary data source for this project consists of 189,658 tweets made between September 1, 2013 and March 4, 2014 that used the hashtag #commoncore. While this is not the only indicator on Twitter of Common Core activity (others include #cc and #ccss), it is the most prevalent tag used for Common Core conversations.

During the six months that we followed the Common Core conversation on Twitter, the volume of tweets was fairly consistent. There were between 25,000-35,000 tweets per month in which a tweeter used the hashtag #commoncore.

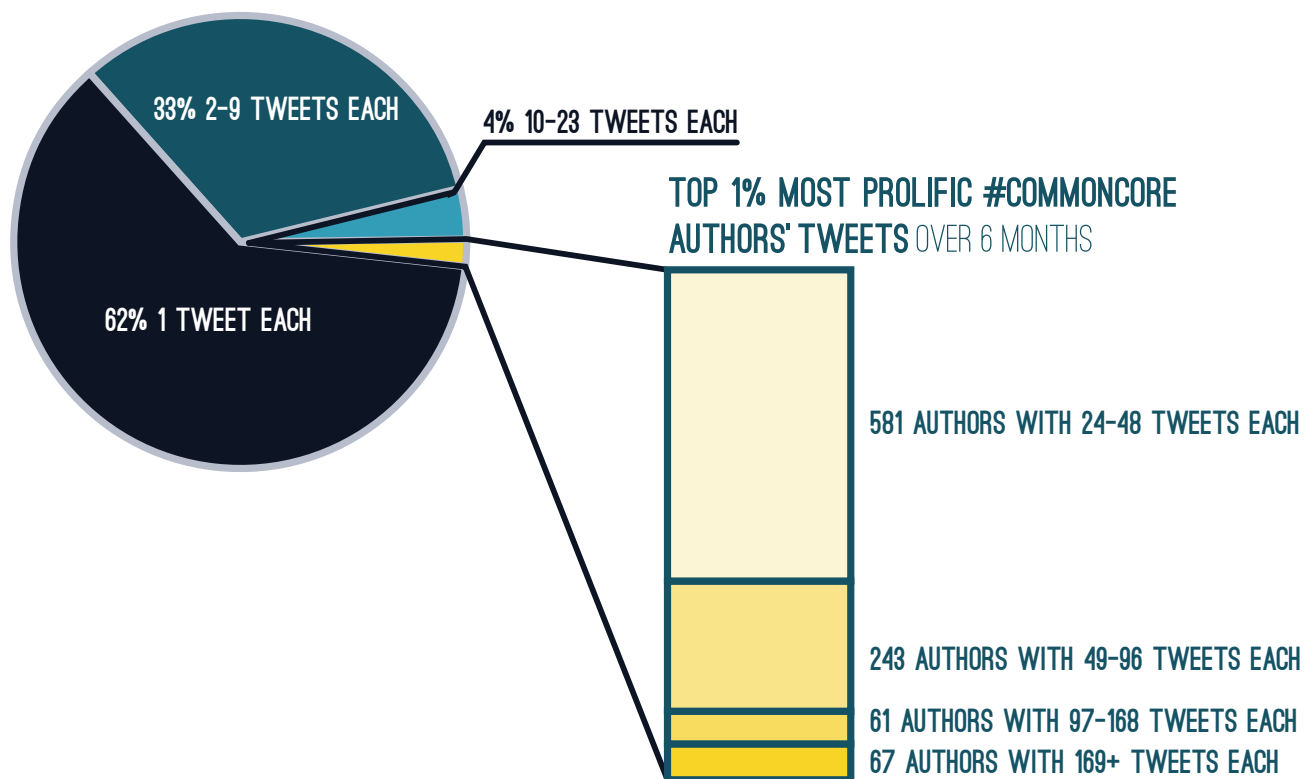
The Distribution of Twitter Activity

The 190,000 tweets from September 1, 2013 and March 4, 2014 came from 52,994 distinct authors who sent out tweets about the Common Core using the #commoncore hashtag.

TWEETS OVER 6 MONTHS



VOLUME OF #COMMONCORE TWEETS, Sent by distinct authors over 6 months



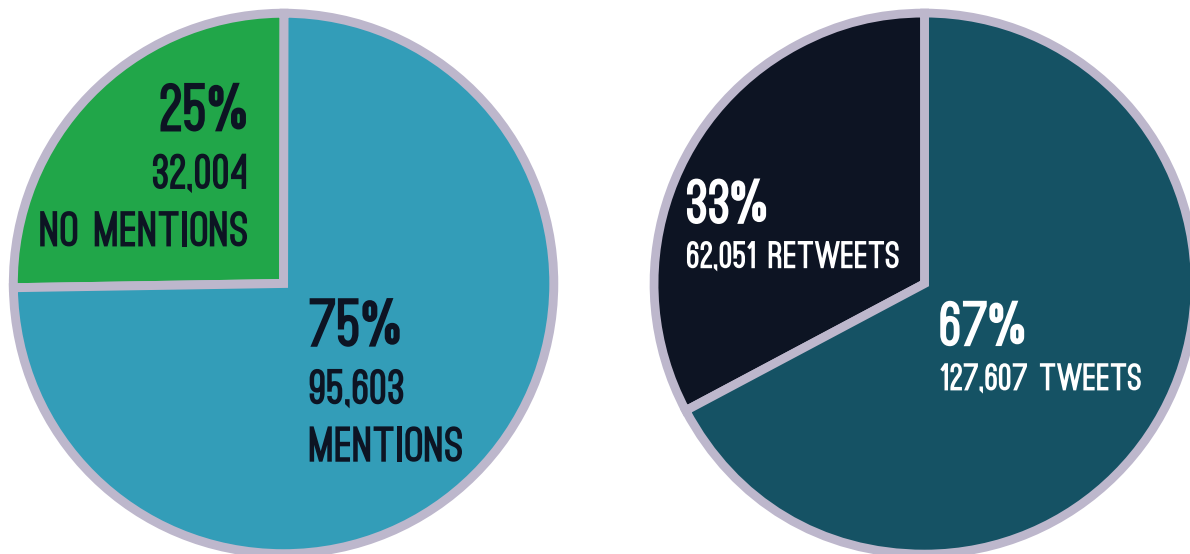
The volume of activity varied tremendously by author. About 60% of the tweets that used #commoncore were fair-weather tweeters who used it only once over the six-month period. About a third of the tweeters sent 2-9 tweets using #commoncore. About 4% of the tweeters used #commoncore 10-23 times.

The sliver representing the top 1% of the #commoncore tweeters constitutes the central actors in our story. Breaking out this group is where the story gets really interesting.

Over the six-month period studied:

- 582 actors sent tweets containing #commoncore 1-2 times per week, on average.
- 243 actors sent 3-4 tweets containing #commoncore per week, on average.
- 72 actors sent 4-6 tweets containing #commoncore per week, on average.
- 67 actors sent tweets containing #commoncore daily, on average.

#COMMONCORE TWEETS, RETWEETS, & MENTIONS, Over 6 months



Of all the #commoncore users, five sent over 1,000 tweets containing #commoncore over the six-month period. That's more than 4 times a day, every day, for six months!

Over the six months that we tracked the Common Core conversation, almost 7 in 10 #commoncore tweets were initiated, and one third were retweeted.

Additionally, 75% of the 127,607 tweets had mentions, indicating that three quarters of the tweets were targeted at one or multiple individuals or groups, even though they were public.

THE GIANT #COMMONCORE NETWORK

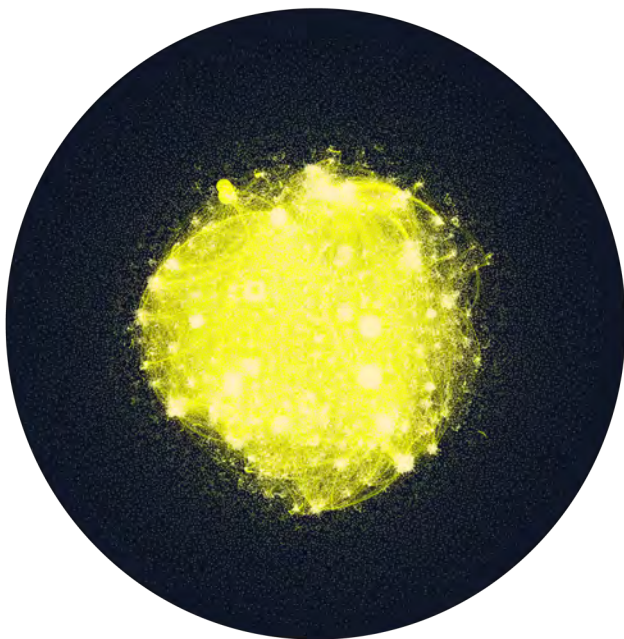
The #commoncore network was a fireball of activity during the six months of our investigation. From September 2013 to February 2014, almost 53,000 distinct Twitter users sent almost 190,000 tweets and retweets using #**commoncore**. In order to appear in this network, an actor had to send a tweet or retweet containing the #commoncore hashtag.

Given the density of the network, it is clear that there is a lot of activity in this system. Further, the volume was fairly steady over this six-month period, ranging from 25,000-35,000 tweets per month.

What you see initially is a densely connected core of interactions about the #commoncore surrounded by bands of more peripheral actors.

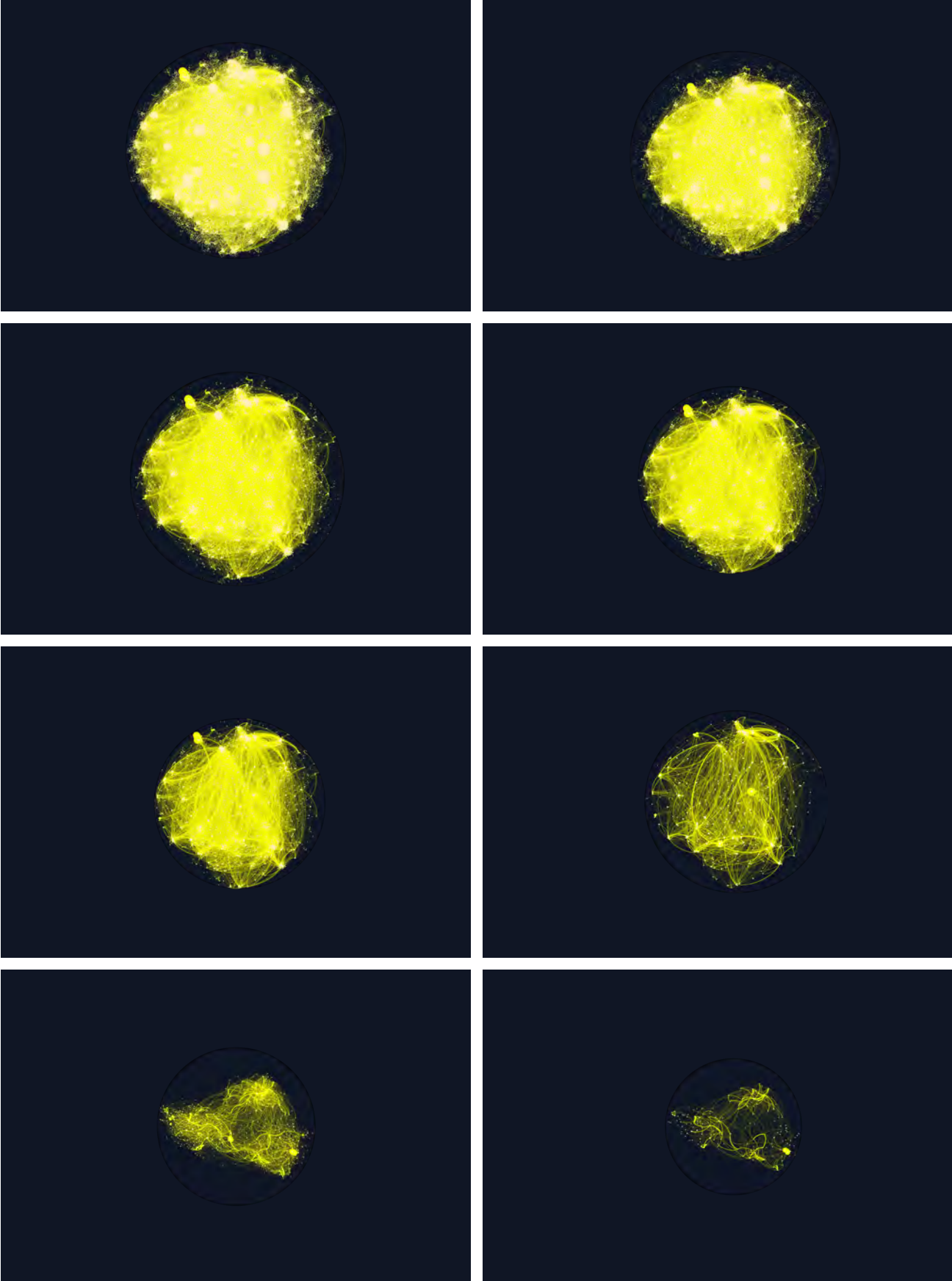
You may also note that there are some very large nodes, like sunspots, within the network. These reflect single Twitter accounts that either received or sent a large number of tweets or retweets. These prolific actors are important in the network because they have disproportionate influence over what flows across the system.

As we increasingly clear away the layers of less active, or secondary, #commoncore users, two observations can be made. First, the actors seem to separate into distinction groups, which represent subcommunities within the #commoncore network. Second, an increasingly defined network of central actors starts to take sharper focus. These individuals are the elite actors that are tweeting and retweeting at much higher volume than those on the periphery.



Visit hashtagcommoncore.com to see the Giant #commoncore Network in action!

Boring into the center of the #commoncore network.



STRUCTURAL COMMUNITIES

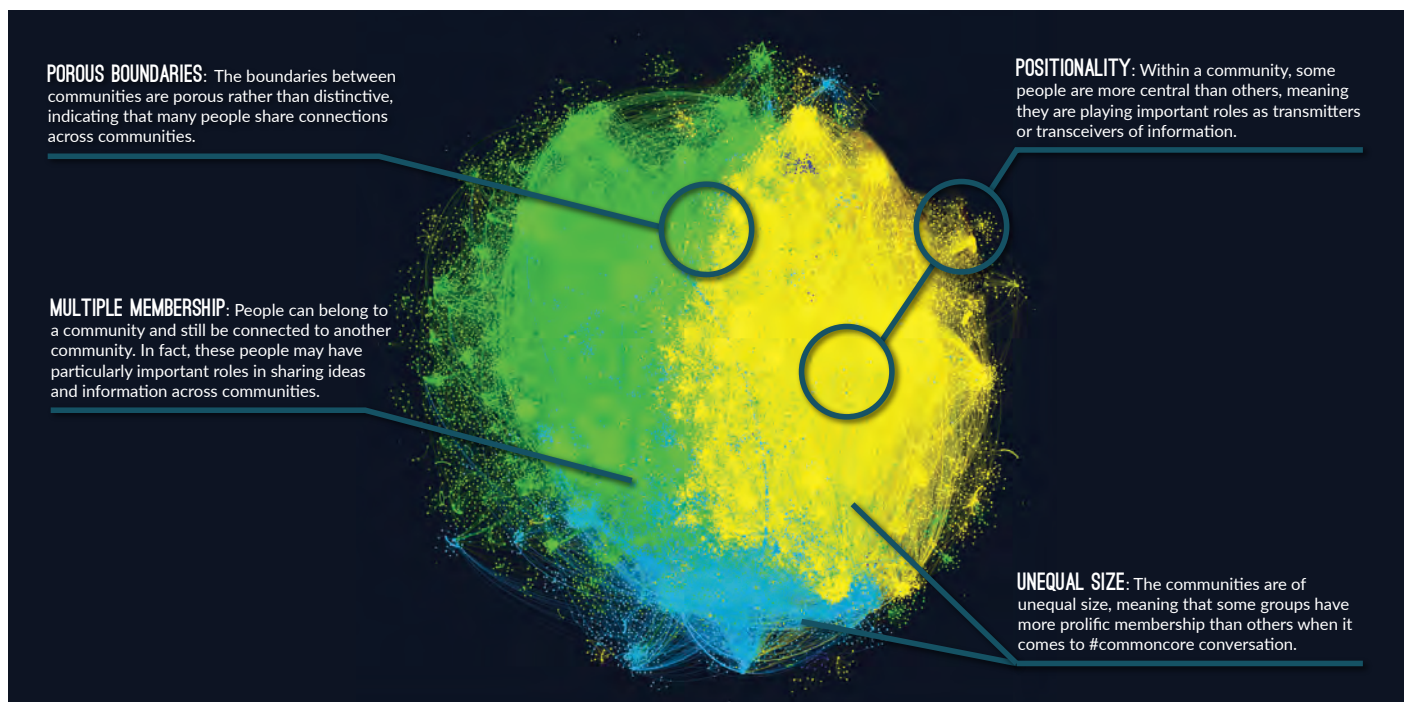
As we delved deeper into the #commoncore network, distinct structural differences between clusters of people began to emerge. Structural communities are subgroups in which some people are more closely tied together than to those outside the subgroup, or have more in-group than cross-group ties.

These communities are distinguished strictly by the structural patterns of participants' interactions. Thus, these communities are based specifically upon the observed behaviors of individuals who have chosen to follow some people in the #commoncore network and not others.

Our analyses suggested that people tended to cleave into three fairly distinct structural communities. These communities differed in size and each had their own central actors.

At this level of the analysis, we cannot draw conclusions about the quality or type of exchanges that occur between actors, but we can observe that subgroups of people are choosing to connect with some people more than others. As such, they can more broadly represent the behaviors and choices of the actors in the network.

Some things to notice about structural communities:



TRANSMITTERS

Transmitters & Transceivers

In this project, we use two main measures to reveal the “elite” actors in the #commoncore network. We use the term elite to describe individuals who are highly active in the network. These elite actors have disproportionate influence within the network—and perhaps beyond.

There are two distinct types of elite actors, which we call *transmitters* and *transceivers*. **Transmitters** are individuals who send out a large number of tweets using the hashtag #commoncore. Social network researchers call the activity of transmitters *outdegree*, which is a measure of the number of tweets a transmitter sends. Outdegree is *not* related to the number of followers a transmitter has, but is strictly a measure of how many tweets an individual posts using #commoncore.

Transceivers are a different kind of elite actor, those who have what social network researchers call high *indegree*. In our analyses, indegree is the combination of the number of tweets a person receives about #commoncore, coupled with the number of times in which they are mentioned in others’ tweets about #commoncore (mentions are tweets in which a user is specified by @username). Mentions are signifiers of importance in the #commoncore conversation. Thus, transceivers act as conduits in the #commoncore conversation because they are the recipients of a lot of commoncore tweets and are mentioned frequently by others.

Finally, while transmitters and transceivers play different roles in social networks, it is important to note that they are not mutually exclusive of each other. In fact, there are a small number of individuals in the #commoncore network that are both elite transmitters and transceivers.

The Top 1% Transmitters in the #commoncore Network

In order to better understand the overall structure of the network and gain deeper insight into the key actors we first created a network comprised of the top 1% of all the **transmitters** from the overall #commoncore community.

In crafting this 1% of the most prolific transmitters, we first took the top 1% of actors that were high in outdegree, meaning that they were posting tweets to #commoncore more than 99% of the other #commoncore tweeters. This resulted in a network of 682 actors.

Actors that are posting more than others are critical; they likely have disproportionate influence over the messages being moved in the network. As such, these actors are highly influential in shaping the conversation.

This rarefied transmitter network retains the three structural communities that we first identified in the overall network. Thus, even honing in on the top 1% of transmitters, they still affiliate in subgroups. In addition, it is easier to see that there are a number of transmitters even among these elite actors who have more outdegree—represented by bigger nodes—than others. That is, there are elites even within the elites. These super-elites are dominating the overall interactions in the network.

The Elite Transmitters in the #commoncore Network

In order to examine the elite transmitters in the outdegree network even more closely, we isolated the actors that were the most prolific. These actors were sending tweets using #commoncore in vastly higher numbers than other individuals in the network over the six month period we examined—on average, more than four tweets per week.

These nodes represent the top 158 most prolific tweeters in the #commoncore network and the connections among them. These individuals are the most prominent and prestigious transmitters in the #commoncore network. As with the 1% network, this network also retains the three structural communities.

Top 1% Transmitters



Elite Transmitters



TRANSCIVERS

Transceivers are a different kind of elite actor than transmitters, who we examined in the previous section – those who have what social network researchers call high indegree. In our analyses, indegree is the combination of the number of retweets a person receives about #commoncore, coupled with the number of times in which they are mentioned in others' tweets about #commoncore (mentions are tweets in which a user is specified by @username). Mentions are signifiers of importance in the #commoncore conversation. Because our definition of indegree is a combination of retweets and mentions, we wanted to protect against people being included as transceivers if they were not involved at all in the conversation. Therefore, we added a final stipulation that to be considered a transceiver, one had to send at least one tweet using #commoncore. This meant that @BarackObama, who never tweeted about the Common Core but was mentioned quite a lot (and rarely kindly), is excluded from our analysis. Thus, transceivers act as conduits in the #commoncore conversation because their #commoncore tweets are retweeted and/or they are mentioned frequently by others.

The Top 1% Transceivers in the #commoncore Network

This graphic shows the top 1% of transceivers in the #commoncore network. These are users whose messages are retweeted and/or they are mentioned by others a relatively large number of times. There are about 650 transceivers in the 1% network. These actors are central to the network because of their role as reverberators of information. In this way, they play the crucial role of having information that is spread about #commoncore across the Twitter network.

While the transceiver network has a different shape than the transmitter network, and is made up of a largely different set of actors, you can see that the transceiver network retains the three distinct structural communities, or factions, that were first identified in the overall network. In addition, as we zoom in on the more elite actors, it is easier to see that there are a number of high indegree actors even among the top 1% of actors. Those individuals are elites in that they are being retweeted or mentioned in the #commoncore network.

The Super Elite Transceivers in the #commoncore Network

As we delve deeper into the elite transceiver network of actors we can see the approximately 150 super-elite transceivers. We can also see that some of these actors have particularly large indegree, which is the combination of the number of retweets with #commoncore, coupled with the number of times in which they are mentioned in others' tweets about #commoncore. The information/opinion/ideas shared by these transceivers is often considered worthy of mentions by others, giving them "prestige" in a network sense.

These social network graphs of relationships give a structural perspective on the #commoncore network, but who are the users that constitute the elite transmitters and transceivers? Are they acting as individuals or representing organizations? And how are they connected together? We will learn about these things in Act 2, the Players.

Top 1% Transceivers



Super Elite Transceivers



THE PLAYERS

ACT 2

At the heart of #commoncore are a set of influential actors that carry tremendous sway in the social network. In this act we introduce you to the actors who make up three very different types of social network influencers: transmitters, transceivers, and transcendents. Transmitters are those who disseminate lots of tweets using #commoncore. Transceivers are those with a different kind of influence – those whose messages are retweeted and/or are mentioned frequently by others in the network. Transcendents are a small yet highly influential group—those users who are present in the elite levels of both the transmitter and transceiver groups.

MEET THE TRANSMITTERS

Transmitters are the broadcasters of Twitter, those who send the highest volume of tweets. Their potential clout comes from the magnitude of their messages. The top 158 elite transmitters in the #commoncore network are shown in the social network map you can access below. These individuals represent approximately 0.25% of the full dataset of people that tweeted using #commoncore during the time of our study, from September 2013 to the end of February 2014. As described in Act 1, transmitters gain ‘outdegree’ by the number of tweets they send using #commoncore.

When you click on the interactive link below, you will see the transmitter network and information about some of the key actors in the network. The size of the circle (node) for each actor represents the volume of tweets sent by that participant over the six months of the study (which is also depicted in the font size of their name). The bigger the name, the more frequently they tweeted. The thickness of the line between two actors provides a sense of the frequency of interactions between them.

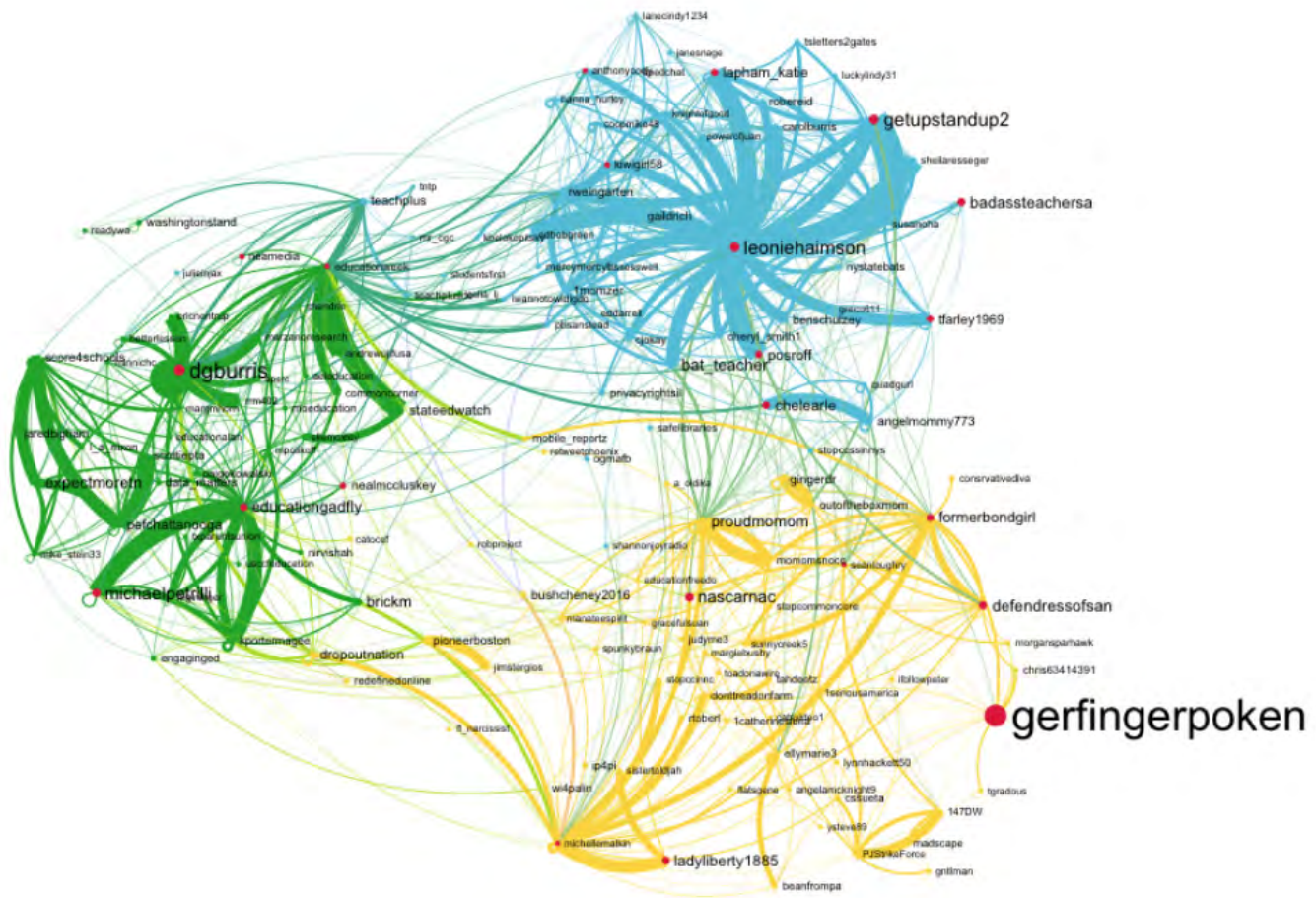
You will notice that, even within this elite transmitter network, there are those who transmit even more frequently than others, as depicted by the larger font size of their names (actors such as @dgburris, @michaelpetrilli, @leoniehaimson, @getupstandup2, @formerbondgirl, @gerfingerpoken). These actors are high-volume broadcasters even among this very elite group of actors—in a sense these actors represent the top tier of the transmitters.

Additionally, and distinct from a transmitter’s volume of tweets, there are some actors who are particularly central and well connected within their factions (like @leoniehaimson (blue), @educationweek (green), and @michellemalkin (yellow)). These actors have both

high out-degree (by the fact of their presence in this elite community) and are well connected to those within their faction (by their many ties connecting them to others within their faction). This makes these actors not only potentially influential over the larger #commoncore network, but also key opinion leaders within their own communities. In a sense, the ideas and opinions of these actors drive the core content of what is shared within their communities.

TRANSMITTERS

The top 158 elite transmitters shown here are the broadcasters of Twitter, those who send the highest volume of tweets.



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Structural Communities in the Transmitter Network

The elite transmitters also split into the three structural communities. The blue, green and yellow colors represent the distinct structural communities, or factions, in the network. These factions are defined strictly by the patterns of connections within the subgroups of the elite transmitters, i.e., who is most connected to whom, both directly and indirectly. Thus, the formation of these groups is produced expressly from the behavioral interactions of these individuals on Twitter— not by any understanding of their value positions or beliefs about the Common Core.

That said, there are some interesting interpretations that can be made from more contextual knowledge about the actors that make up each of the three structural factions:

- The **Yellow faction** [58 people/groups] is comprised largely of those outside of education who tend to oppose the Common Core. These are actors who have taken a largely anti-Common Core position due to their interest in other advocacy issues (anti-federalism, privacy issues, political partisanship, etc.) that are often conflated with the Common Core debate.
- The **Blue faction** [57 people/groups] is comprised of organizations and individuals within education who also largely oppose the Common Core. These actors tend to be people who are against the Common Core for reasons both related to the Standards themselves (developmentally inappropriate, ignore social and emotional issues), or education issues tied to the Standards (anti-testing, etc.)
- The **Green faction** [43 people/groups] is primarily comprised of individuals and organizations within the education sector and who tend to support the Common Core, or are connected in the Twitterverse to those who support the Common Core.

A few additional points are worth noting as we examine these data. First, there are members within these factions who may not fit neatly into the three Common Core advocacy positions described above, but whose placement in the network is driven by their connections to others in the faction. Thus, for example, *Education Week* does not have a position on the Common Core, but they tend to be connected on Twitter to those groups who support the Common Core (the green group).

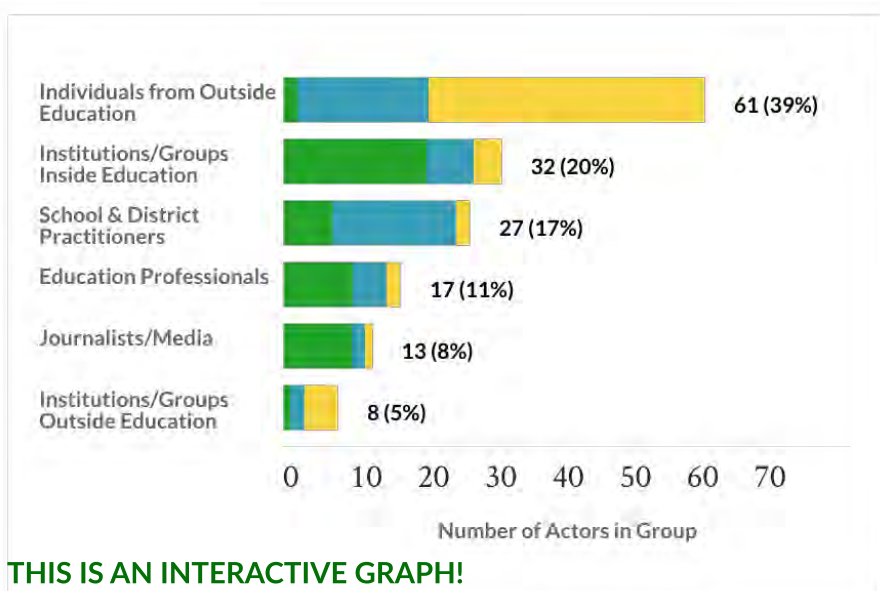
Second, in general, the members of these three factions are largely self-contained and separated from those in the other factions. This is what social network researchers call homophily (i.e. ‘love of the same’), which is the tendency of individuals to associate with others with similar belief systems. Members of these factions tend to reinforce one another’s beliefs, making it difficult for other ideas to penetrate. However, there are also

some notable actors who connect across subgroups. These **network bridges** include media sources such as @educationweek, pundits such as @michellemalkin, advocacy groups such as @proudmomoms, and individuals such as @angelmommy773. These actors are particularly important in information communities because they connect otherwise disconnected actors and therefore have the potential to spread ideas and information from one insular group to another. Because they may filter the type of information they share, they may in turn skew perspectives within a subgroup.

Transmitters by Position Type

It is also enlightening to examine the elite transmitter network through a different set of groupings—by their position type. This bar graph, color-coded by sub-network, deconstructs actors by faction and position relative to the education community.

The most dominant position type in the transmitter #commoncore network—61 people or almost 40% of the elite transmitters—are individuals who are not formally affiliated with education. These individuals tend to be in the anti-Common



THIS IS AN INTERACTIVE GRAPH!
 Visit www.hashtagcommoncore.com.

Core/outside education group (Yellow), like @gerfingerpoken, @formerbondgirl, and @defendressofsan; others are in the anti-Common Core/inside education group (Blue), like @chelearle and @kiwigirl58.

The second-most prolific position of elite transmitters in the #commoncore network is the 32 actors who are affiliated with education institutions or groups. These actors, like @educationgadfly, @expectmoretn, @washingtonstand, tend to be from organizations in the pro-Common Core group (green), but exist across all three factions.

Following closely behind are 27 school- and district-level practitioners, who comprise 17% of the elite transmitters. These are mostly practicing teachers and school principals. About two-thirds of these actors are grouped in the anti-Common Core/inside education faction (blue), while about a quarter of these education practitioners are supportive of the Common Core (Green).

A fourth position type, comprised of 17 elite transmitters, is the education professional.

These people, such as Randi Weingarten, Michael Petrilli, and Chris Minnich, are predominantly classified with the group that tends to support the Common Core (green). Some are also connected to the anti-Common Core/inside education group (blue).

Finally, and notably, 13 people—representing 8% of the elite #commoncore transmitters—are journalists or members of the media. These include print, online, and radio media, and represent both non-partisan and partisan media entities. As we shall see in the next section, members of the media are even more visible in the elite transceiver network.

Takeaways about Transmitters

1. Transmitters are broadcasters on Twitter, they send the highest number of tweets.
2. The elite transmitter network contains many more actors who oppose the Common Core than support it.
3. The largest group in the transmitter network is actors from outside of education, representing about 40% of the network.
4. Almost 20% of the transmitter network is made up of practicing educators, mostly teachers and school principals, and most are opposed the Common Core.
5. In general, supporters and opponents of the Common Core are fairly disconnected, but a few central actors play the role of network bridges and have the potential to spread ideas and information from one insular group to another.

MEET THE TRANSCIVERS

Transceivers play an important and distinctive role in social networks. These actors serve as conduits in systems by having their messages relayed (i.e. retweeted), engaging in public conversations with others, or otherwise being mentioned by others. In our definition, transceivers gain indegree by either having their #commoncore tweets retweeted or being mentioned in others' tweets containing #commoncore (to see more about the definition of transceivers, see Act 1). This makes the transceivers very important players in the elite network because their messages are deemed to be important enough by others to be widely shared.

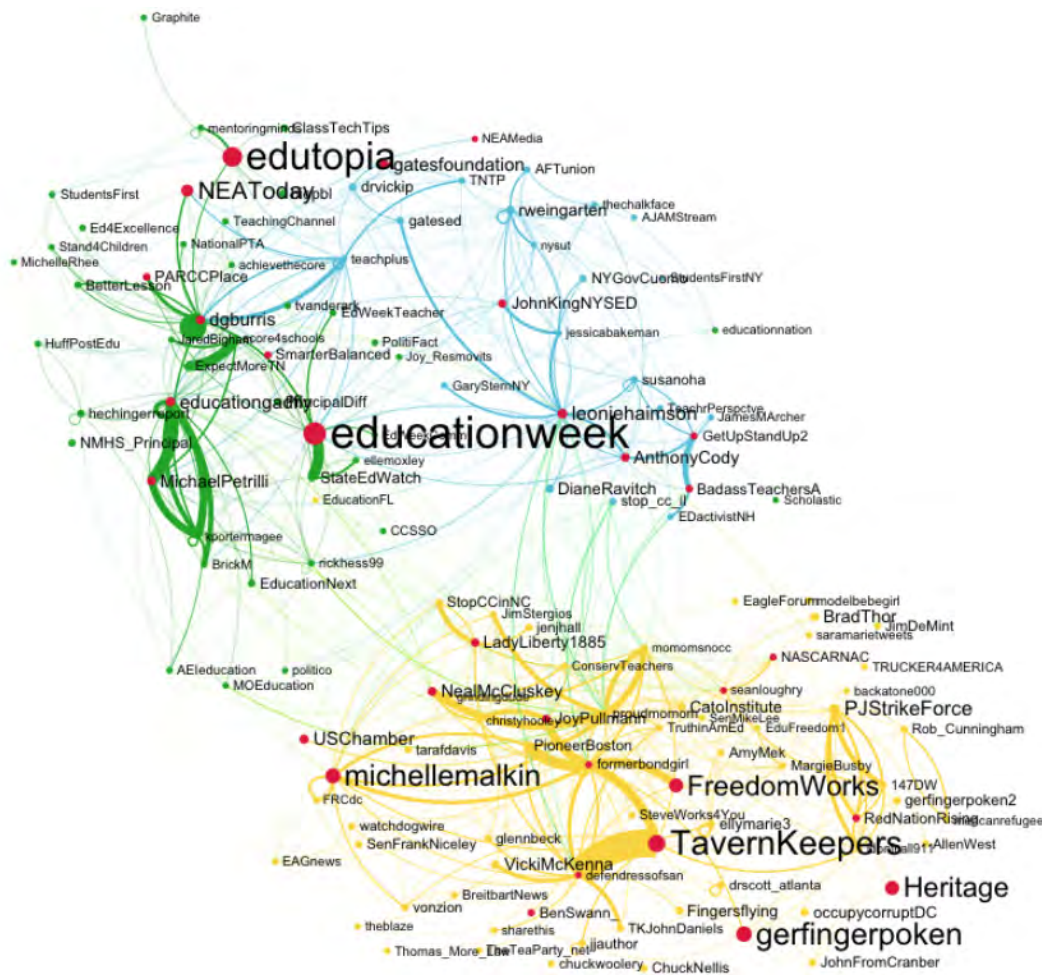
When you click on the interactive link below, you will see the 139 members of the transceiver network and information about some of the key actors in the network. These actors are in the top 0.25% of the #commoncore transceiver network. The size of the circle (node) for each actor represents the volume of tweets sent by that participant over the six months of the study (which is also depicted in the font size of their name). The bigger the name, the more frequently they tweeted. The thickness of the line between two actors provides a sense of the frequency of interactions between them. You will see that a few of these individuals are also in the transmitter network, but there are also a host of new actors that are not present in the transmitter network. The difference between the “roles” of these two types of actors gives us additional insight into this large and complex network.

Structural Communities in the Transceiver Network

The transceivers are also organized into the three distinct structural factions. Again, these communities are structurally defined – membership is based strictly upon the behavioral patterns of communications within and between the subgroups of the elite transceivers, i.e., who is connected to whom by communications, either directly or indirectly. Thus, the formation of these groups is not produced by any understanding of a actor's positions relative to the Common Core, but rather their predominant connections according to their interactions on Twitter.

TRANSCEIVERS

Transceivers serve as conduits in the network by having their #commoncore tweets retweeted or by being mentioned in others' tweets containing #commoncore.



**THIS IS AN INTERACTIVE NETWORK!
Visit www.hashtagcommoncore.com.**

The three structural communities have different membership, but represent roughly the same groupings as the Transmitter network:

- The **Yellow faction** [68 people/groups] is comprised of those outside of education who tend to oppose the Common Core, or those who are connected to these actors. These actors have taken an anti-Common Core mostly position due to their interest in other advocacy issues (anti-federalism, privacy issues, political partisanship, etc.) that are often intermingled with the Common Core debate.
- The **Blue faction** [28 people/groups] is comprised primarily of actors within education who also tend to oppose the Common Core. Members of this group are largely disposed to be against the Common Core for reasons both related to the Standards themselves (developmentally inappropriate, ignore social and emotional issues), or education issues tied to the Standards (anti-testing, etc.).
- The **Green faction** [43 people/groups] is comprised of those actors, largely within education, who tend to support the Common Core or who are predominantly connected with Common Core supporters.

Five additional points about the #commoncore transceiver network are worth noting. First, there are some actors within these factions who do not fit neatly into these three advocacy positions, but whose placement is driven by their connections to others within the group. For example, @edutopia does not have a position on the Common Core, but they tend to be connected on Twitter to those groups who support the Common Core. Thus, @edutopia is structurally positioned in the green faction.

Second, and relatedly, there are others whose position on the Common Core seems antithetical to the faction with which they are aligned. These actors, such as @gatesfoundation and @JohnKingNYSED (who are in the blue faction), are connected to others in the faction who tend to mention them frequently in their tweets (often unkindly). Thus, the Gates Foundation and New York Education Commissioner John King are located in the blue faction because we have defined mentions as an attribute of one's transceiver status, and these actors are often mentioned by those in a particular faction. Aside from the context of these actors' placements, their presence in the high influence transceiver network raises their level of visibility and therefore increases their influence in the #commoncore network.

Third, you will notice that even within these high transceiver communities, there are those who either are retweeted and/or mentioned in others' tweets even more frequently than others, as depicted by the larger size of their names. Thus, actors like @Heritage, @FreedomWorks, @TavernKeepers, @AnthonyCody, @leoniehaimson, @gatesfoundation, @NEAToday, and @edutopia are considered to be highly influential even among this very elite group of actors as they are retweeted a disproportionate number of times and/or are frequently mentioned, which makes them exceedingly "popular" and important in the

#commoncore network.

Fourth, independent of a transceiver's indegree volume, there are those who are particularly central and well connected within their transceiver sub-communities (such as @leoniehaimson and @rwiengarten (blue), @educationweek and @educationgadfly (green), and @michellemalkin and @gerfingerpoken (yellow)). These actors have both high indegree (by the fact of their presence in this elite community), and are well connected to those within their network (by their many retweets and mentions passed along by others in the #commoncore network to others in those peoples' networks). This makes these individuals not only influential within the larger #commoncore network, but also key opinion leaders due to their centrality within their factions. In a sense, the ideas and opinions of these actors serve as the foundation of the narrative within their faction.

Finally, in contrast to the transmitter network—in which there were relatively few connections across the three factions—there are quite a few cross-community interactions in the transceiver network. Interestingly, there are more connections between the two within-education groups (green and blue), despite their differences on the Common Core. This is not surprising when we consider that actors in these two groups have probably interacted on other education issues. Additionally, there are some notable groups and individuals who connect to the other factions. These “network bridges” include media sources like @educationweek, pundits like @michaelpetrilli, service organizations like @teachplus, and other organizations like @USChamber (US Chamber of Commerce). These people and groups are particularly important in information communities because they connect otherwise disconnected actors and therefore have the potential to spread ideas, information, and resources from one insular faction to another. In addition, individuals that are in this brokering role may also filter information or even intentionally select what messages to send along—in this sense they are not necessarily passive transmitters of information, but may flavor the communication with their own particular perspectives.

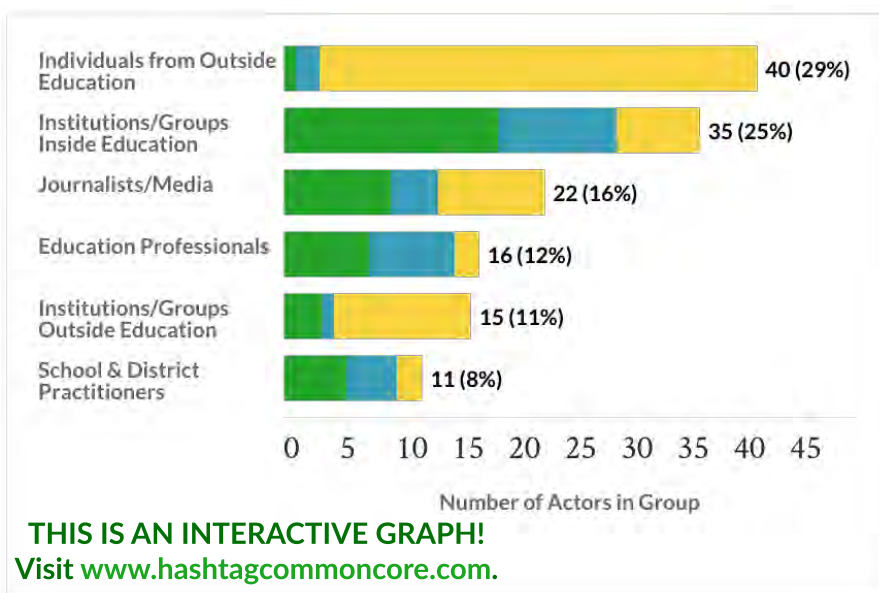
Transmitters by Position Type

We can also examine the actors in the elite transceiver network through a different lens. Here, we have organized the transceivers into six position types. This bar graph is also color-coded by network so you can see the proportion of people in each position type.

The two most dominant position types of transceivers are individuals from outside of education and institutions/groups inside of education. Actors in each of these two position types make up about a quarter of the elite transceivers. Actors from outside of education come almost exclusively from the yellow faction of Common Core opponents. Of those actors inside of education, about 50% were supportive of the Common Core (green); 30% came from the within-education anti-Common Core sub-community (blue), and the remaining 20% from the anti-Common Core outside-education sub-community (yellow).

The third most prolific position type of elite transceivers in the #commoncore network is journalists, comprising 16% (22 of 139 actors) of the elite transceivers in the #commoncore

network. The strong presence of media members in the transceiver network is suggestive of the way in which political and policy issues that are playing out on Twitter can be passed along to more mainstream media. These individuals and groups, including @educationweek, @BenSwann, and @NEAMedia are fairly equally distributed across the three sub-communities. In some of these cases, but not all, the presence of a journalist or member of the media in a faction reflected their connections to members of that sub-community rather than any particular position on the Common Core.



Finally, and interestingly, school and district practitioners are *least likely* to be transceivers in the #commoncore network. Only 11 actors, or 8%, of this elite group were teachers, principals, or other education practitioners. Half of these actors were in the pro-Common Core faction (green). Interestingly, the group most impacted by the Common Core and who presumably would have some important insights or opinions is not as influential as others who, at least on the surface, are removed from the day-to-day experience and implementation of the Common Core. In a sense, at least in the #commoncore Twitterverse, practicing educators are at best a dwarf planet.

Takeaways about Transceivers

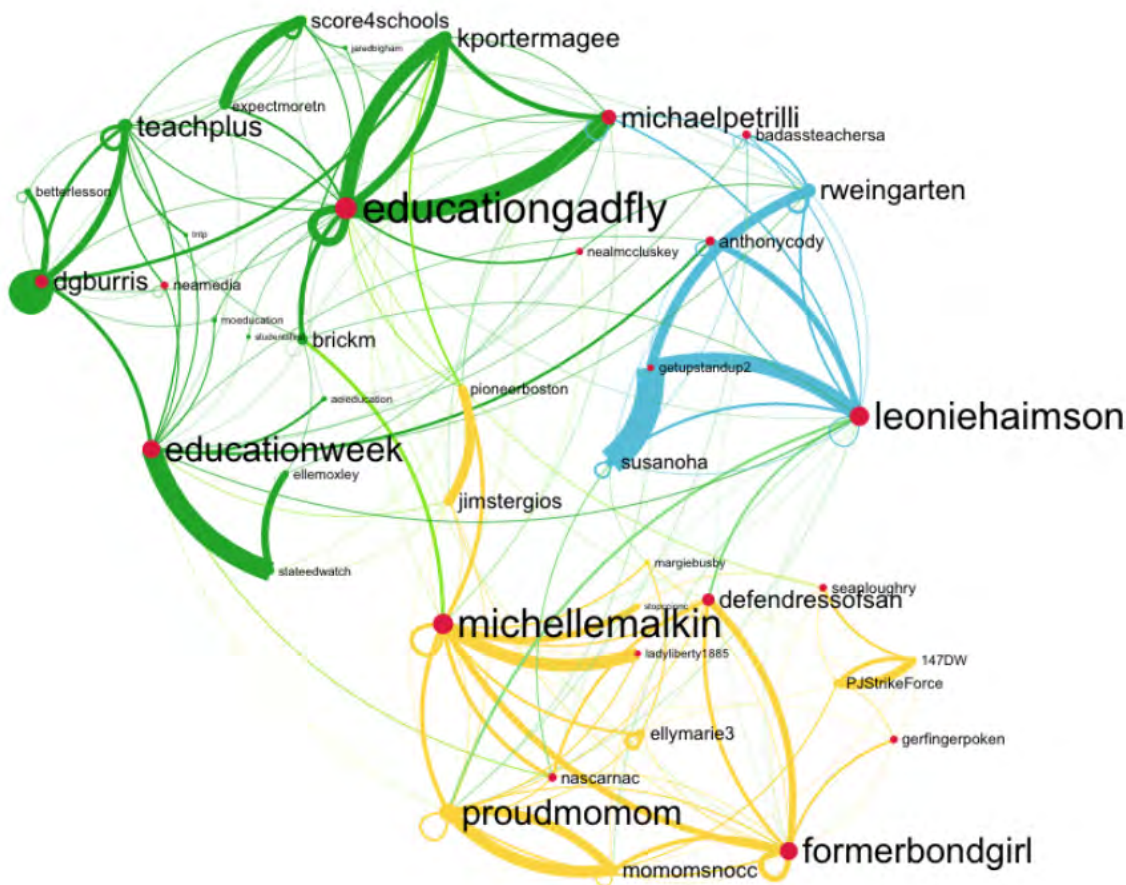
1. Transceivers act as influential conduits in a Twitter network by having their messages retweeted and their names frequently mentioned.
2. The elite transceiver network is dominated by those, both inside and outside of education, who oppose the Common Core.
3. The two most dominant position types of transceivers are individuals from outside of education and institutions/groups inside of education.
4. The third most prolific position type of elite transceivers in the #commoncore network is journalists. This strong presence of media members in the transceiver network indicates how political/policy issues about the Common Core that are playing out in a niche community on Twitter can be passed along to the mainstream conversation, thus potentially influencing public perceptions of the Common Core. Practicing educators—those potentially most influenced by Common Core implementation—are least represented in the elite transceiver network.

MEET THE TRANSCENDERS

Finally, we turn to a particularly unique and highly influential group of individuals of elites we call the transcendents. The 41 transcendents are so named because they are present in *both* the elite transmitter and transceiver networks. These 41 actors carry the highest clout in the #commoncore network. They have both high outdegree, defined as sending the highest number of #commoncore tweets, *as well as* high indegree, defined as a combination of being retweeted and mentioned in the highest number of tweets. To put this in perspective, the sending and receiving activity of these individuals is greater than 99.75% of the rest of the tweeters using #commoncore!

TRANSCENDERS

These 41 actors are present in both the elite transmitter and transceiver networks, sending the highest number of #commoncore tweets and being retweeted and mentioned in the largest number of tweets.



THIS IS AN INTERACTIVE NETWORK!
Visit www.hashtagcommoncore.com.

This potent combination makes these actors *the* most prominent in the entire network, setting them apart from the other nearly 60,000 individuals in the #commoncore network. These actors can be considered the nucleus of the activity within the #commoncore network. The information produced and reproduced by these 41 actors permeates the rest of the network and touches upon the interactions within almost all corners of the network. Their positions and opinions dominate the network, and as such, become the de facto representation of the overall message of the network.

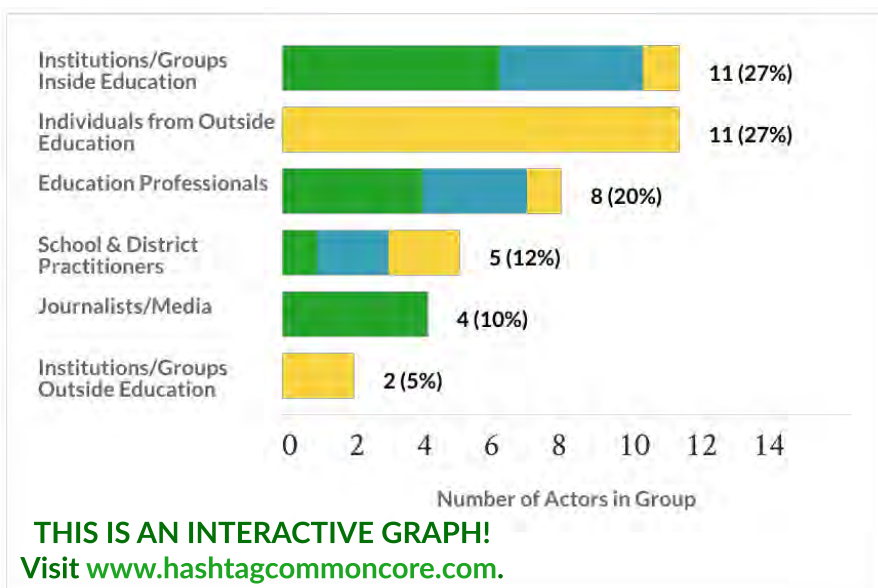
When examining the connections between the #commoncore actors in the social network map, it is particularly important to note two things. First, the connections are comprised of degree: the combination of indegree and outdegree between these actors. Second, this network is constructed by considering only the connections among these actors in this particular elite group of transmitters and does not take into consideration others in the #commoncore network, nor others in the networks of these actors.

Structural Communities in the Transcender Network

As we can see from the social network map, the transmitters are fairly equally distributed by structural community, or faction, with 14 of the 41 (37%) affiliating with the green (generally pro-Common Core) faction; 19 of the 41 (22%) connecting with the blue (generally anti-Common Core, within education) faction; and 17 of 41 (41%) associating with the yellow (generally anti-Common Core, outside of education) faction. It is notable that four of the 15 actors in the green faction (@michaelpetrilli, @BrickM, @educationgadlfy, and @kporteragee) are affiliated with the Fordham Institute, and are heavily connected because they tend to retweet and mention each other's tweets.

Transmitters by Position Type

The bar graph classifies the actors by both position type and faction. We can see that groups within education and individuals outside of education are the most dominant position types, each making up about a quarter of the transmitters. While the groups inside of education have representation in all three factions, individuals from outside of education with both high indegree and outdegree are exclusively in the yellow faction.



Only 5 (12%) of the 41 transmitters are education practitioners. These individuals, who are all teachers, are fairly equally distributed across the three factions. There are four media groups/journalists in the transmitter network (@educationweek, @StateEdWatch, @NEAMedia and @ellemoxley), and all of these are classified with the green faction. The first two users are affiliated with the education newspaper Education Week. @NEAMedia is the media team of the National Education Association labor union, and Elle Moxley is a reporter from Kansas City, Missouri.

Takeaways about Transmitters

1. The transmitters are the most influential in the #commoncore network because they *both* transmit a high number of tweets *and* are frequently retweeted and/or mentioned. For this reason, their positions and opinions dominate the network, and in doing so, become the de facto representation of the overall message of the network.
2. The 41 transmitters are fairly equally distributed across the three factions in the #commoncore network.
3. Groups within education and individuals outside of education are the most dominant position types, each making up about a quarter of the transmitters. While the groups inside of education have representation in all three factions, individuals from outside of education with both high indegree and outdegree are exclusively in the yellow faction.
4. Education practitioners and journalists/media groups are present in the transmitter network, but are represented by relatively few actors.

THE CHATTER

ACT 3

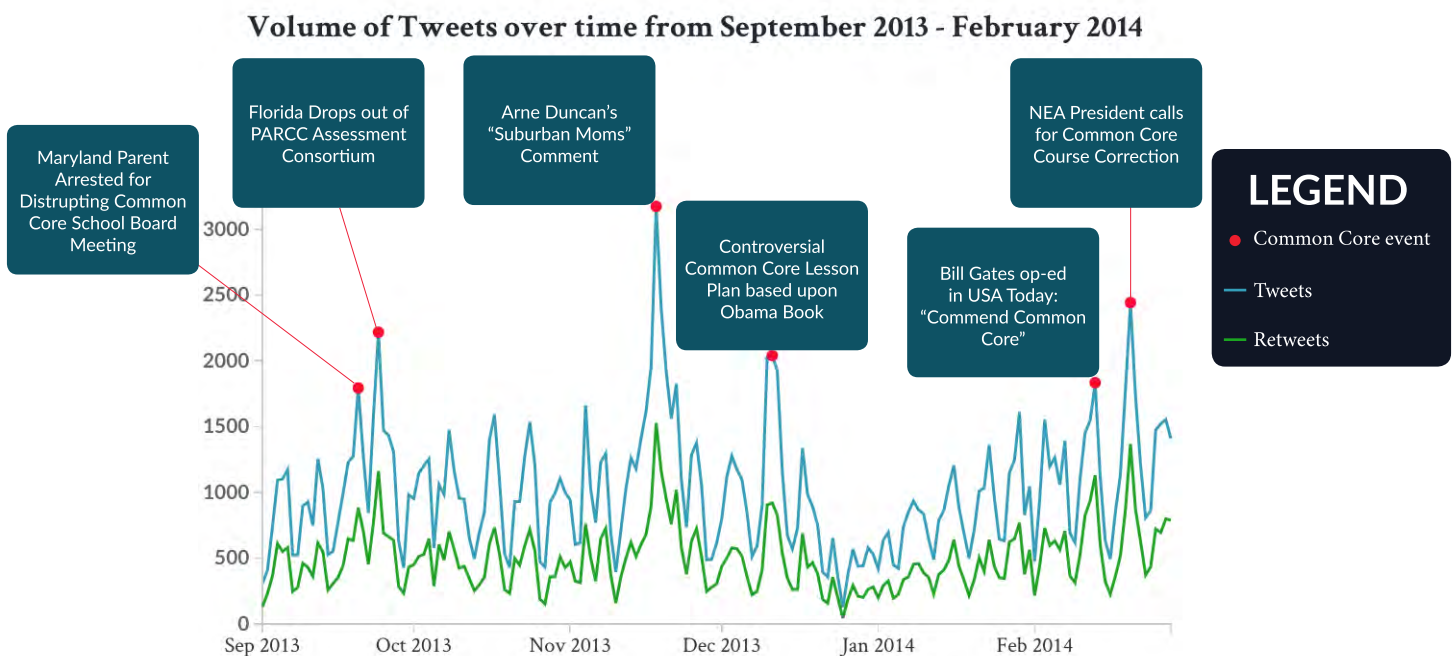
Twitter users have become quite adept at packing a punch into their 140 character tweets. In this act, we delve into both the form and content of the messages of the elite actors in the #commoncore network. We conduct a close examination of the content their tweets, the references they make to education topics and political/policy issues, differences between the factions in the type of language they use, and the metaphors different actors employ. In doing so, we comment on both the liberating and constraining consequences of the chatter, which often blurs the distinction between facts and misinformation.

CONTENT OF THE TWEETS

For the duration of our data collection, the #commoncore network was both active and geographically diverse. We look at the patterns of tweets over time, highlighting some of the topics that spurred bursts of activity. We also examine the self-reported geo-locations of the actors, revealing their geographic diversity.

The Heartbeat of #commoncore

THE HEARTBEAT OF #COMMONCORE



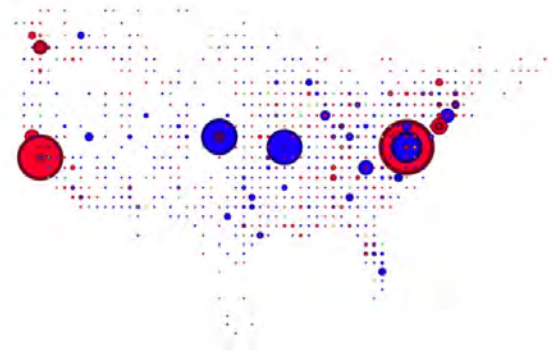
We can also look at the daily volume of tweets over the period September 2013 to February 2014. The resulting graph looks like an echocardiogram—the heartbeat of #commoncore tweets. The black line shows the volume of tweets and the blue line represents retweets, daily, over the six month period. The largest number of tweets on a single day was 3,174 on November 18, 2013—the day Secretary of Education Arne Duncan made a comment about white suburban moms being upset about the Common Core (Strauss, 2013). The smallest volume of tweets on a day was Christmas Day, 2013, which had only 127 tweets. The average daily amount of #commoncore tweets was 474 tweets.

By examining the heartbeat of activity in the #commoncore network, we can see that the #commoncore conversation at least mirrors, if not contributes to, the major Common Core related news stories.

Although our data analysis only spans this six-month period of tweets, we continue to follow #commoncore, and the network has continued to grow even more active, with a monthly averages of 40,000-50,000 tweets, as compared to the approximately 30,000 average monthly tweets in our dataset (click here for more about the dataset).

Geo-Locating #commoncore Tweets

The #commoncore chatter came from all across the United States. Since Twitter allows users to report where they live, we used this self-reported data, when available, to generate a map of the geographic location of tweets incorporating #commoncore over the six months that we examined. This map shows the distribution of tweets from across the country. The size of the node represents the volume of tweets coming from that location. The red circles in the map refer

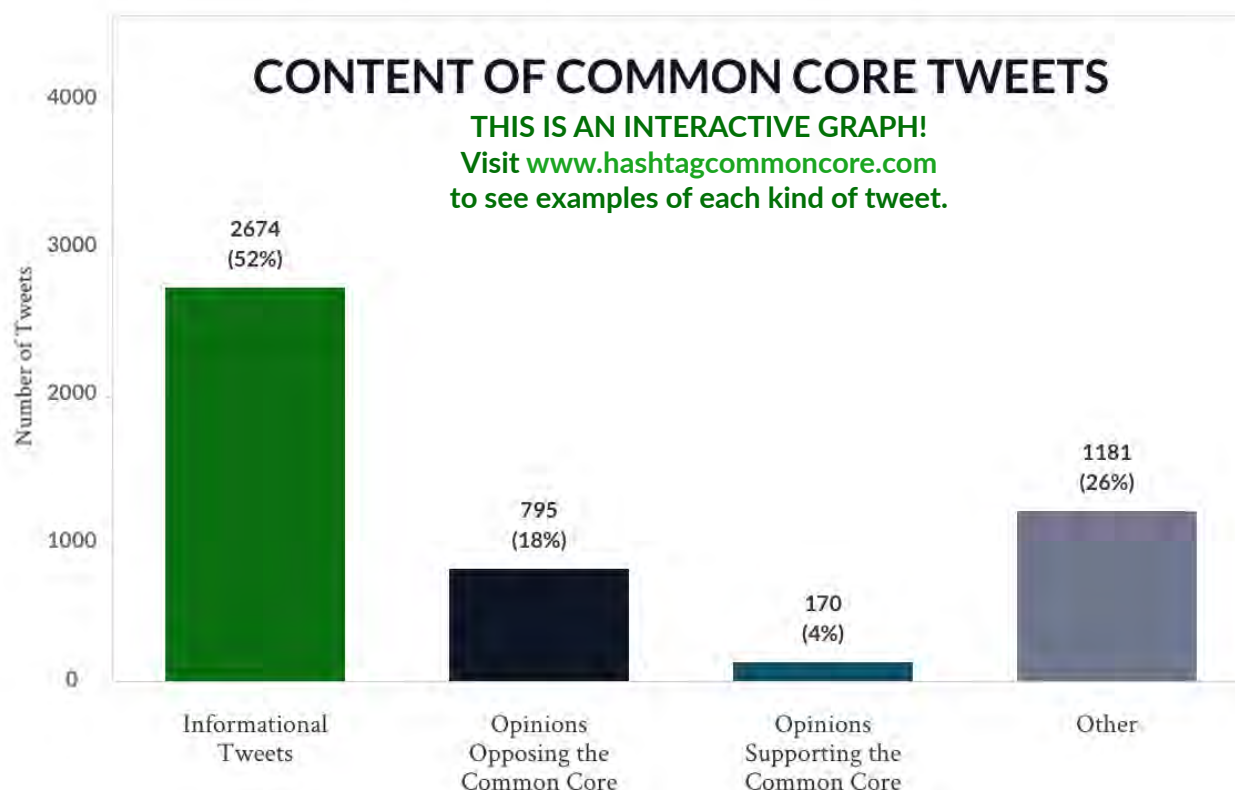


to transmitters, while the blue circles refer to transceivers. There are tweets from virtually all states in the country. There were particularly large pockets of activity from California, Kansas, Missouri, and Washington, DC. These locations comport with the geographic locations of some of the prolific activists in the #commoncore network.

The Content of #commoncore Tweets

The top 256 transmitters and transceivers in the #commoncore network represented a minuscule 0.5% of the 52,994 actors in the network, but their activity produced a robust 21% of the total #commoncore tweets!

To take a closer look at the content of the tweets of the top transmitters and transceivers, we took a random sample of 4,500 tweets (12%) and coded them in a variety of ways, including for content, political references, and choice of phrasing.

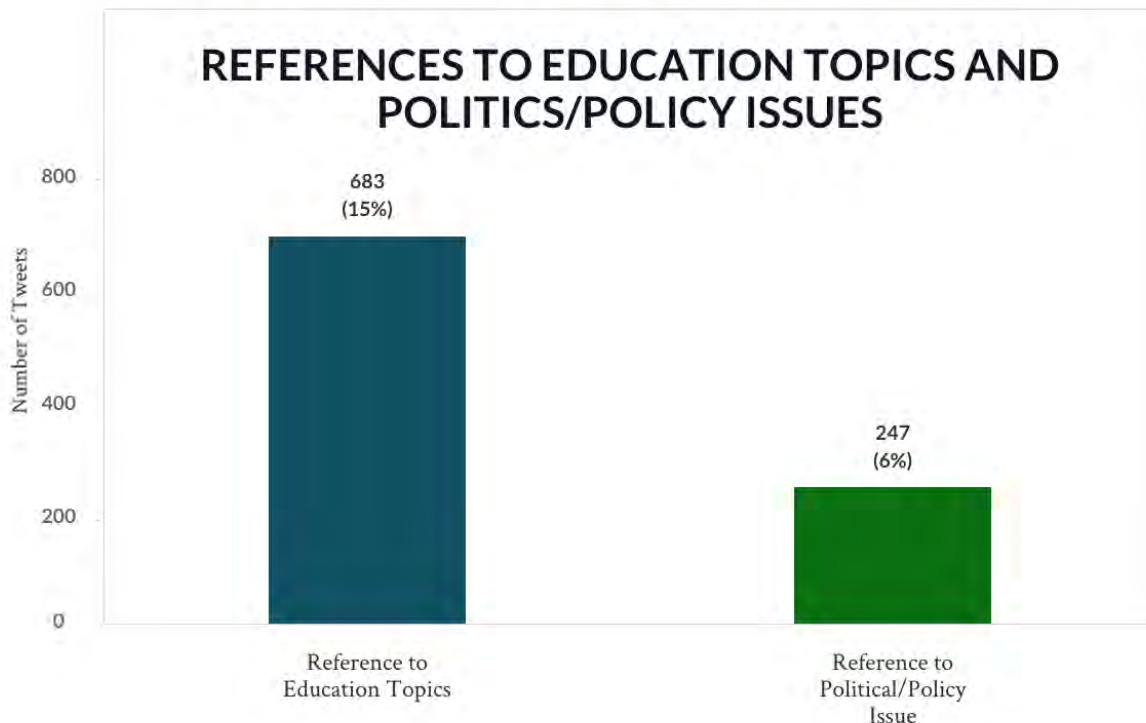


Not surprisingly, the majority of the tweets in this subsample came from transcoders (47%), just under a third (32%) came from transceivers, and the remaining 21% came from transmitters. Broken down by faction, these represented 39% from the green faction, 19% from the blue faction, and 42% from the yellow faction.

We coded the content of the random sample of tweets from the elite actors to examine the distribution of opinion-based versus informational tweets. Overall, 52% of the random sample of tweets from the elite actors were informational. About 18% contained opinions opposing the Common Core, while just 4% contained opinions in support of the Common Core. The remaining 26% contained tweets that do not fall into any of the previous categories.

We also analyzed the distribution of tweets according to the three factions (green, yellow, blue) we introduced in Act 2. A significantly greater proportion of the informational tweets came from the green faction than from the other two factions (green>blue>yellow). Opinions opposing the Common Core came in significantly higher volume from the yellow group than the blue or green (yellow>blue>green). Opinions supporting the Common Core came predominantly from the green faction, moreso than the blue or yellow factions (green>blue>yellow).

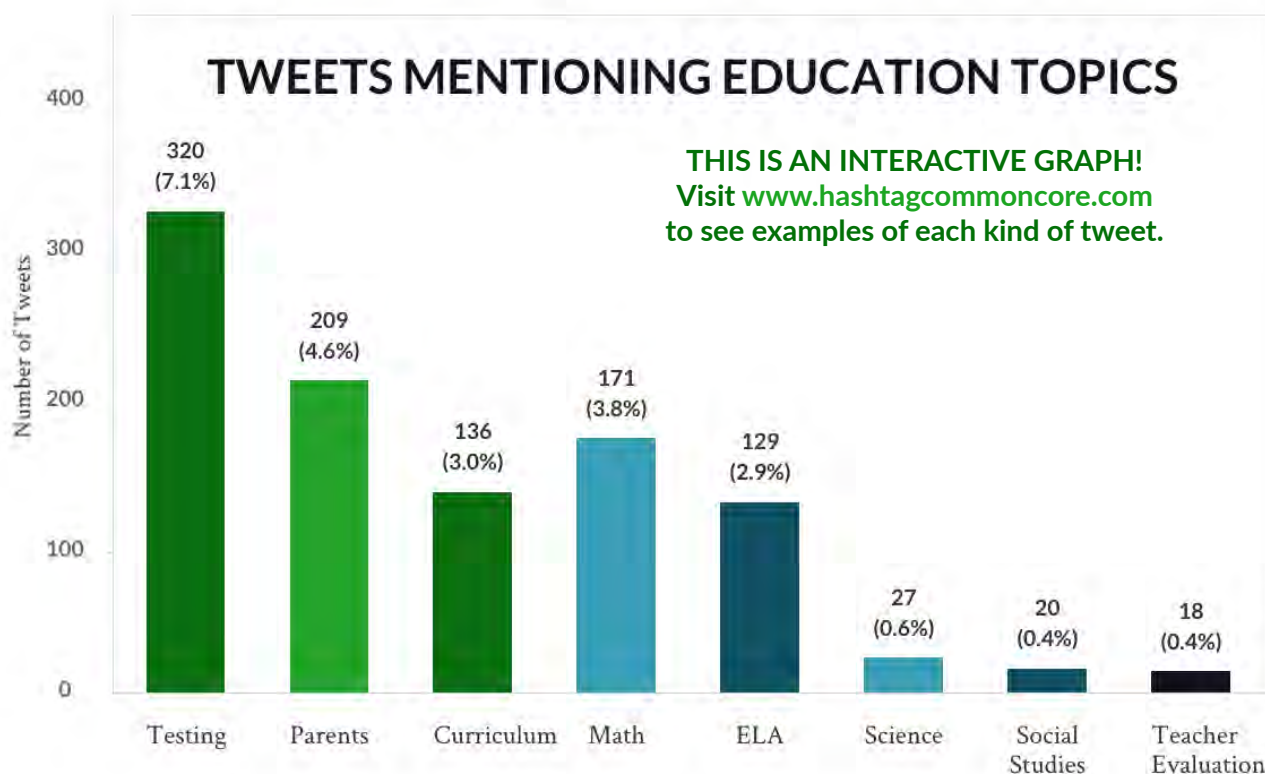
POLITICS IN THE TWEETS



Over the past several years, the Common Core debate has become heavily politicized. We can gain insight into the political dimensions of the debate by examining political references in the random sample of tweets from the most prolific #commoncore tweeters. First, we coded the sample of 4,500 tweets by their references to education topics and education policy/political issues. We found that about 21% (930 tweets) had a reference to either education topics or politics/policy related issues. Of those, 15% (683 tweets) were references to education topics, while about 6% (247 tweets) referenced education politics or policy issues.

Education Topics Mentioned in #commoncore Tweets

What were the education topics referenced in the random sample of tweets of the elite actors in the #commoncore network? As shown in the graph below, even though the Common Core itself does not have a testing component, the most frequently mentioned education topic was testing, which was mentioned in about 7% of the tweets. Parents were mentioned in almost 5% of the tweets, while curriculum was referenced in about 3%. Specific education subject areas were mentioned in about 8% of the tweets, with mathematics and English language arts (ELA) mentioned far more frequently than science or social studies. Teacher evaluation, a major component of Race to the Top (RTTT)-funded initiatives, was mentioned in just 18 #commoncore tweets.

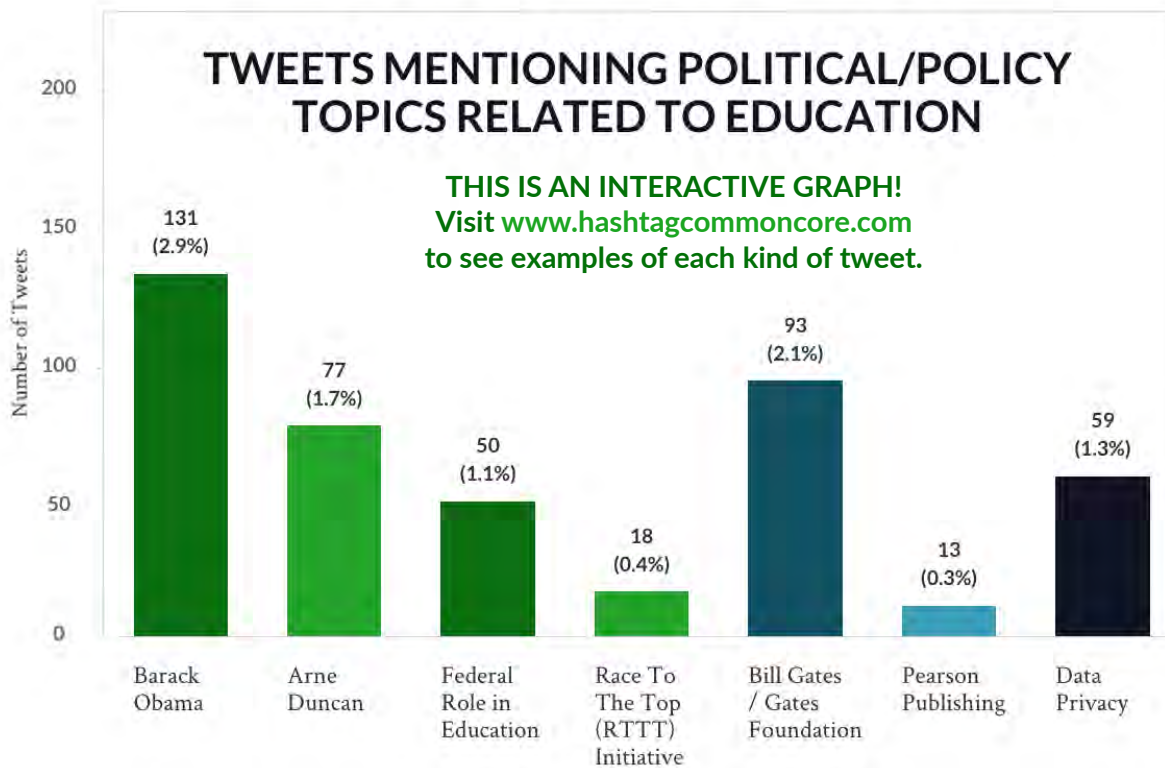


Political/Policy Issues Mentioned in #commoncore Tweets

Although less frequent than mentions of education topics, there were abundant references to political/policy issues connected to the Common Core in the sample we analyzed. As shown in the graph below, about 6% of the coded tweets referenced the Obama administration or federal education policy. This included 131 tweets directly mentioning President Obama, 93 tweets referring to Secretary of Education Arne Duncan, 50 tweets referring to the federal role in education, and 18 tweets directly mentioning the Race to the Top initiative, in which federal funding was used to entice states to adopt the Standards.

Business and philanthropic interests were also mentioned in a number of #commoncore tweets. While groups like the Broad Foundation and General Electric (GE) were mentioned in tweets, two groups received more (and mostly unwanted) attention from members of the #commoncore network. Bill Gates and the Gates Foundation were mentioned in 93 tweets, or just over 2% of the sample, and the Pearson Publishing Company, publisher of many Common Core curricular and testing materials, was mentioned 13 times in the sample we analyzed.

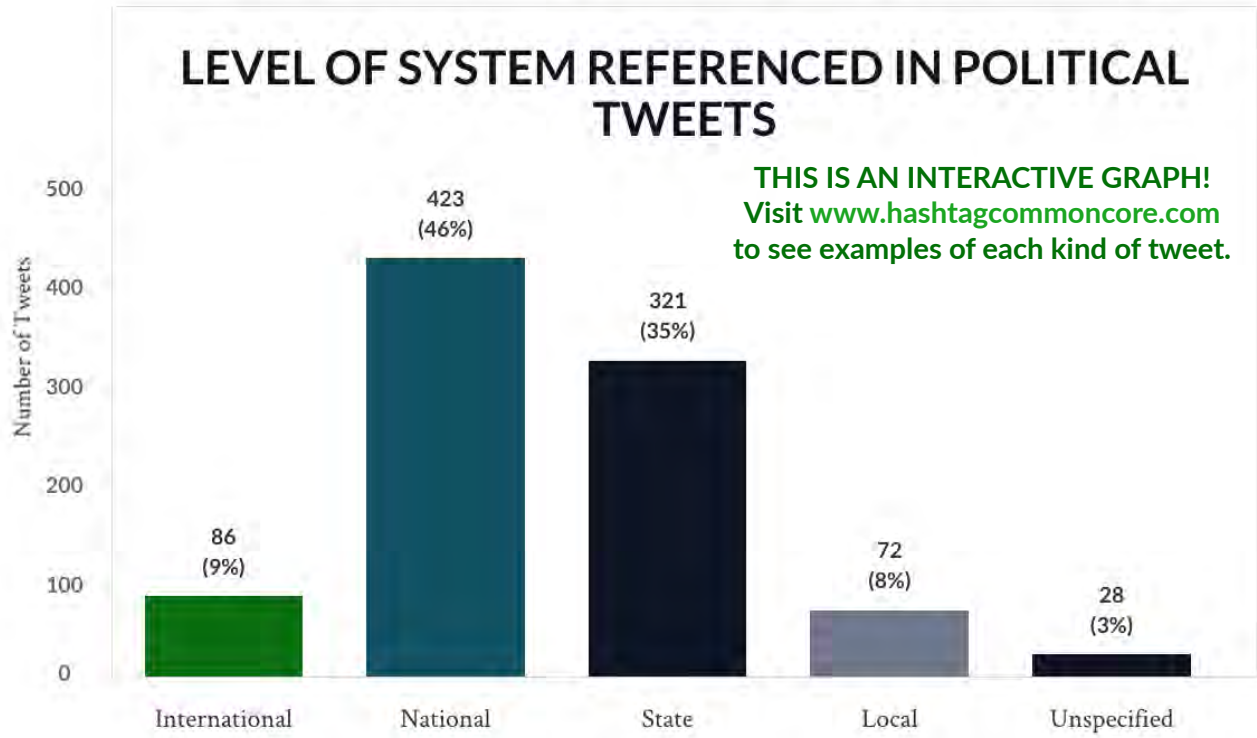
Finally, the issue of data collection and student data privacy issues related to the Common Core was mentioned in 59, or 1.3%, of the tweets we coded.



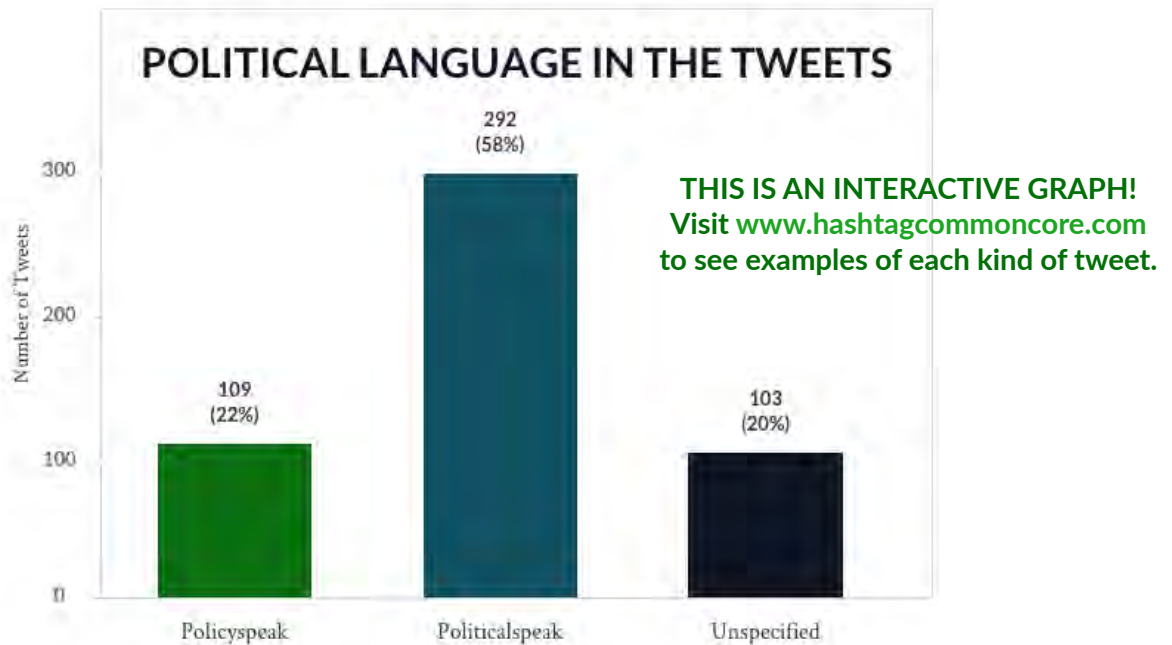
System-Level References in Political Tweets

In our final analysis of this section, we examined the 930 tweets that were coded as either education topics or politics/policy-related issues to see what level of the education system they referenced. The results below show that almost half of the tweets, or 46%, referenced national issues or politics. Just over a third of the tweets (35%) referenced state-level activity. About 10% of the tweets referenced either international politics or local politics.

As the data in this section show, many tangentially-related issues intermingled in the Twitter discussion on #commoncore. These data indicate that there was a strong conflation of the Common Core State Standards with other education topics (i.e. testing, curriculum) and political/policy issues (President Obama, Secretary Duncan and the Obama administration's education policies). Thus, the Common Core was a focal point for a range of issues for both education groups and those interested in larger social issues.



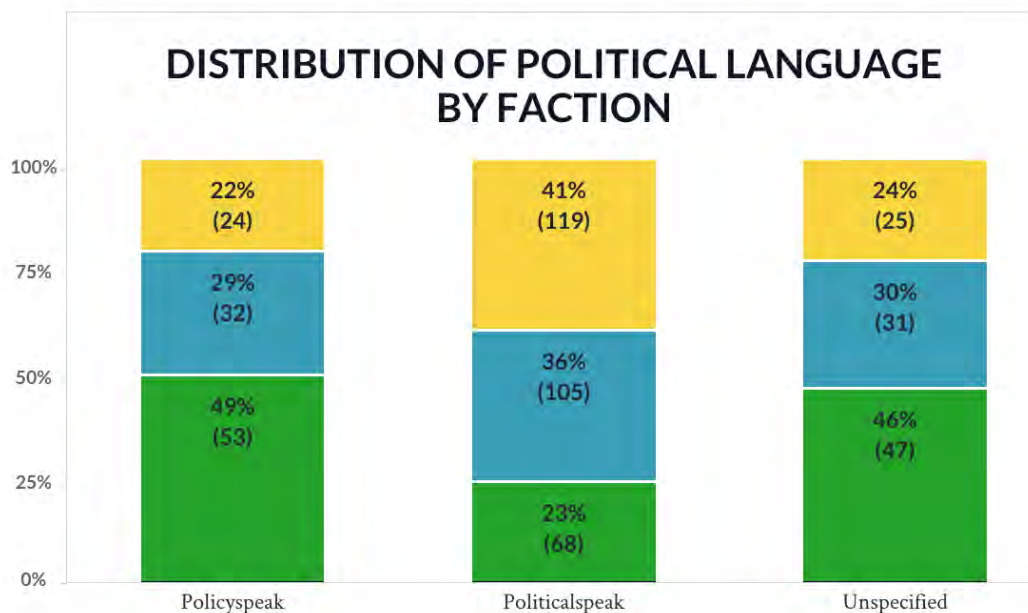
POLITICAL LANGUAGE OF THE TWEETS



As we examined the tweets that had political references, we started to notice an interesting distinction in the language of the tweets. Some of the tweeters used rational, analytical language that appealed to the intellect, while other actors employed more visceral, emotional language that stirred emotion and spoke to more elemental instincts. We dubbed these two approaches “policyspeak” and “politicalspeak.” Policanspeak refers to the cooler, more rational language that appeals to a policy audience, where debate is based on the merits of the evidence and the logic of the argument. Politicalspeak is more emotional, and appeals to peoples’ passions. We wondered about both the presence of these types of discourse in the tweets and whether the different factions employed one approach or the other more frequently. We hypothesized that the proponents of the Common Core would use policyspeak more frequently and that opponents, particularly those from outside of education, would use politicalspeak more frequently.

To explore this question, we drew a sample of tweets from the 930 that referenced education topics or politics/policy issues (see Politics in the Tweets). Because this sample was heavily weighted toward tweets from the faction of actors outside of education (yellow), we took the lowest represented group (the blue faction, which contributed 168 of 930 tweets) and drew equivalent random samples for the green and yellow groups. This produced a sample of 504 tweets. We then coded these on a three point rubric of 1= Policanspeak, 2=Politicalspeak, and 3= Undetermined.

Overall, as shown in the graph below, almost 60% of the tweets were coded as politicalspeak. About 20% were coded as policyspeak, and the remaining 20% were neither politicalspeak nor policyspeak.



Political Language by Faction

Next, we examined the distribution of responses by faction. As shown in the graph below, almost half of the 109 policanspeak tweets were made by members of the green faction (those who tended to support the Common Core). About a third of the policanspeak tweets were from the blue faction (those within education who tended to oppose the Common Core). Finally, about 20% of the policanspeak tweets came from those in the yellow faction (those from outside of education who tended to oppose the Common Core). There was a statistically significant difference between the proportion of policanspeak tweets by faction, with the green faction having more than both of the other factions, and no difference between the yellow and blue factions (green > (blue = yellow)).

This pattern was reversed in the politicalspeak tweets. Of the 292 political speak tweets, 40% were made by members of the yellow faction, while just over a third (36%) came from the blue faction, and just under a quarter (23%) of the politicalspeak tweets were made by those in the green faction. Both the yellow and blue factions had significantly more political speak tweets than did the green faction ((yellow = blue) > green).

Within all the tweets, a discursive undercurrent started to emerge; tweets have much to reveal based on the semantic choices of their authors. As these analyses show, the different factions are employing different linguistic devices that draw upon different syntax—either rational or emotive—to move their messages. This may suggest that the advocates of the Common Core believe, as the Standards are being enacted in most of the states, that the political debate has passed and we are now in a policy implementation context. At the same time, opponents may still view the Common Core as a political issue that can be reversed through swaying public opinion. Thus, Common Core supporters may be appealing to the cooler logic of policy implementation, while opponents are operating in the theatre of political passion.

THE METAPHORS IN THE TWEETS

Is the pen really mightier than the sword? In their provocative 1980 book, *Metaphors We Live By*, authors George Lakoff and Mark Johnson argue that metaphors are more than just rhetorical devices; they shape *the very way we interpret and understand the world*. “Metaphor is pervasive in everyday life,” they contend, “not just in language but in thought and action.” They lay out a compelling case, suggesting metaphors organize how we frame issues because they stir gut feelings, connecting to our past experiences and semi-conscious beliefs. Just like equating the pen and sword, which paints a mental picture likening these two instruments as weapons of power and influence, metaphors forge mental connections between different concepts and ideas. Once you start thinking about the metaphors omnipresent in language, it’s hard to escape their pervasive influence. While our purpose here is not to conduct a thorough discourse analysis of the complex chains and levels of metaphor and metonymy found in the tweets, the core idea of the ubiquitous nature of metaphors and their influence on perspectives motivates our investigation of the metaphors present in the tweets from the #commoncore network.

The metaphorical language chosen by tweeters evokes certain images and underlying paradigms. Furthermore, the medium of Twitter itself is unique, as it forces adherents to pack messages into 140 characters, spaces included. Because of this, people use far more staccato language, a lot of shorthand references, other hashtags that allow the same message to travel along multiple threads, mentions to particular others (using @name), and links to other web-based content, including blogs, news articles, and videos. While some decry the parsimony of Twitter as a shackling of expression, we also found the range of style strikingly rich. Brevity, at times, can be the soul of wit.

The tweets we analyze for metaphorical content are predominantly from the coded subsample of the dataset. As themes arose, we did additional searching of the entire dataset to see if these were persistent themes or more isolated cases. From these analyses, we noted at least six themes in which a range of #commoncore tweeters used similar metaphors to tie opposition to the Common Core to other hot-button cultural/ideological issues. These included:

- The Common Core as a Threat to American Values
- The Common Core as an Experiment on our Children
- The Common Core as a Source of Physical Harm to Children
- The Common Core as a Source of Psychological Harm to Children
- The Common Core as a Threat to Freedom
- The Common Core as a Threat to Future Generations

While we did not conduct our analyses by faction (green, blue, yellow) it is interesting to note that virtually all of these evocative connections came from views opposing the Common Core. This may be related to the fact that Common Core advocates tended to use more analytic policyspeak while opponents used the more visceral politicalspeak.

The Common Core as a Threat to American Values

One theme used by opponents of the Common Core in their #commoncore tweets was to connect the Common Core reform to a degradation of American values. The notion that education reforms carry with them the values of their proponents in an old one, and has been manifested in debates about numerous reforms from those of the progressive era of the early 20th century to the “math wars” of the 1990s (Schoenfeld, 2004). Virtually all policy choices can be seen as a trade-off between different underlying priorities and value systems, and any

decision or activity can be interpreted as a prioritization of one value system over another.

Because education is often charged with developing the ways future citizens think, it is a particularly high-stakes arena. The very idea of local control of education is rooted in the notion that curricular choices should reflect local values and not be forced from a distant government. This argument hearkens back to the very roots of America.



The metaphor of the Common Core as a vessel for the transmission of an (unwanted) value system is exemplified in the tweets below. They associate the Common Core with a set of values of undesirable others (socialists, ideologues, progressives, liberals). These bogeyman opponents are also catchwords that may catalyze certain oppositional groups, which is a key part of the argument for the power of metaphors. Further, some imply that this is being done surreptitiously or by sleight of hand, as most effectively stated in the tweet by @seanloughry.

The Common Core as an Experiment on our Children

A frequent charge against undesired education initiatives is that there is no evidence to support their use and that implementing them without such evidence is akin to conducting an experiment upon our children. Unfortunately, very few educational practices pass this litmus test, and therefore virtually all prevailing educational approaches are in use without rigorous evidence of their efficacy.

There are, in fact, recent movements in education to move more toward the medical model of applying randomized controlled trials to educational interventions before their widespread use. However, many large-scale social policy initiatives such as standards-based reform are simply not amenable to such random assignment methods, as it would raise serious questions on how states would be selected. Would we randomly assign the

Common Core to States? What states would allow themselves to adopt or not based on a coin flip? Despite such impracticalities, the language of using children for experimentation of education initiatives often evokes fear and loathing.

The tweets below decry the Common Core as an experiment on our children. They connect the Common Core to various kinds of experimentation, including animal testing (i.e. guinea pigs), and medical testing. The example from @CarolinaCates explicitly makes the connection between testing the effectiveness of drugs and Common Core implementation, by equating “BigPharma” and “BigEd.” In this tweet and the two from @gamesmarcher and @coughlan4senate (a New Yorker running for state senate) the “Big Government” (i.e. federal government) is the perpetrator of experiments on kids.

“The Common Core as an Experiment on Our Children”

@donttreadonfarm
@michellemalkin It's The Parents' Manifesto on #CommonCore “our children will not be guinea pigs 4this education experiment”
@PROUDMOMOM

#CommonCore is a massive policy experiment on our children. If BigPharma was acting like BigEd, Left would be in uproar @BuncombeSchools
@CAROLINACATES

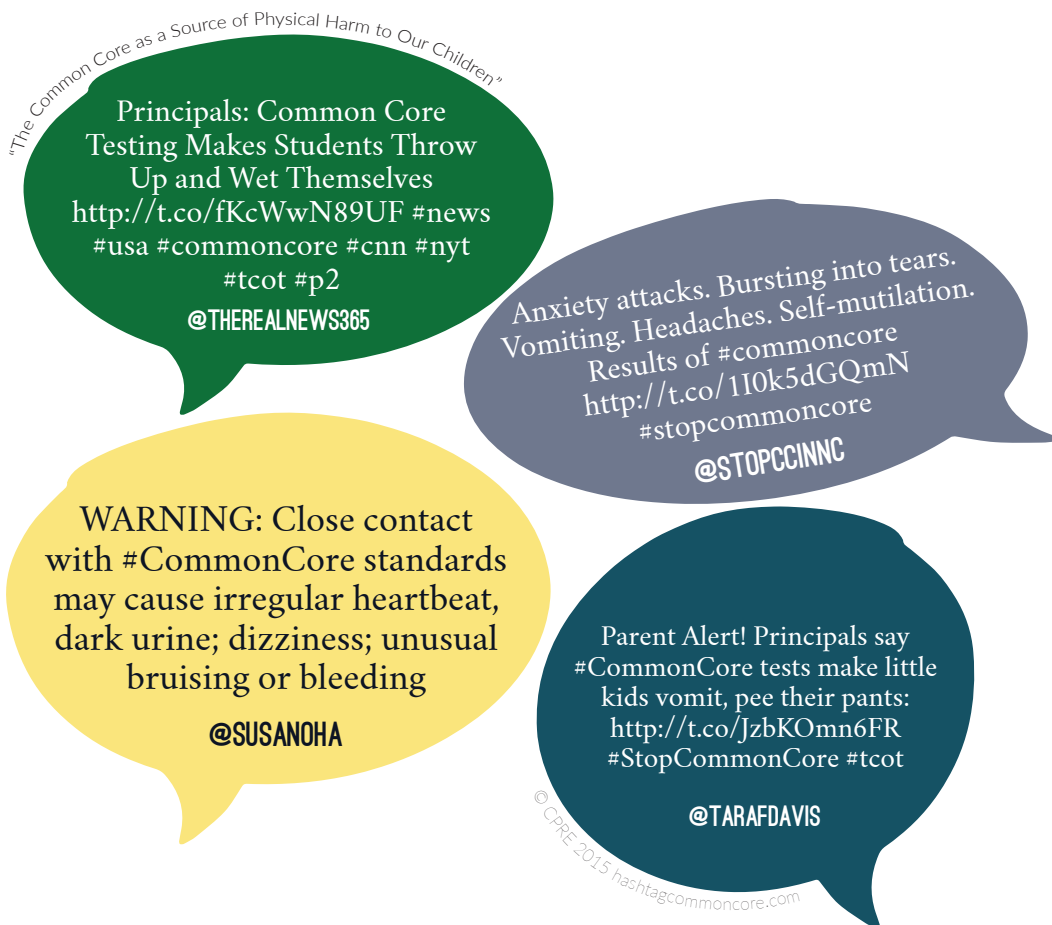
Education Experts Also Oppose Core <http://t.co/nzW1gqKbpb>
Wake up ppl #CommonCore is an experiment,kids=guineas
#stopcommoncore #education
@FORMERBONDGIRL

I bet #Democrats & #Republicans agree: Big Government can't experiment on our kids. Stop #CommonCore Pls RT <http://t.co/9GTtv485Xp>
@JAMESMARCHER

Classrooms should be laboratories for democracy, not a social science experiment for a federal government run amuck
#commoncore #education
@COUGHLAN4SENATE

©CPRE 2015 hashtagcommoncore.com

The Common Core as a Source of Physical Harm to Children



Another pervasive metaphor in the #commoncore tweets was the Common Core as a cause of physical harm to children. This was often associated with testing, but sometimes directly connected with the Common Core. The language of these tweets referred to horrible maladies such as vomiting, headaches, heart palpitations, and self-mutilation, then posited that these afflictions were directly caused by the Standards (by using words like 'makes', 'causes', and 'results in'). Of course, the connection between a set of expectations on paper and these physical ailments is mediated by a wide variety of things, most notably the structures of education that link the Standards with pressure to achieve them, but these intermediary components are backgrounded to make the connection seem direct and imminent.

The Common Core as a Source of Psychological Harm to Children

While physical harm is threatening, perhaps even more menacing is the specter of psychological damage. There was a strain of #commoncore tweets that used language implying psychological threats to evoke the dangers of the Common Core to children. As the tweets below demonstrate, tweeters used such horrifically evocative terms as “mental child abuse,” “parental neglect,” “ruining kids’ minds,” and “brainwashing” to draw a connection between the Common Core and mental impairment. In doing so, this category of tweets sought to make explicit the connection between children’s intellectual and psychological development. The language tacitly reminds us that education initiatives that structure student learning can also convey messages influencing children’s developing belief systems (i.e. brainwashing).

The Common Core as a Source of Psychological Harm to Our Children

@StudentsFirstNY
#CommonCore is mental
child abuse Who ever wrote
lessons should be held
accountable. #ObamaCORE

@STUDENTSFIRSTNY

#CommonCore's hijacking of
education fundamentally
transforms 14,000 hours of K-12
parental approved neglect. #tcot
<http://t.co/24MBnk8nTQ>

@ROB_CUNNINGHAM

New York City kindergartners
left in tears by new Common
Core tests #commoncore
#stopcommoncore
<http://t.co/JH6Pc1JvfL>

@STOP_CC_IL

tired of government telling YOU
how to Think,Eat,Drink? By
Brainwashing our children It's
time to take your control back.
End #CommonCore

@TRUCKER4AMERICA

@StudentsFirstNY
@JohnKingNYSED @nypost
Satanic lessons ruining our
kids minds... REPEAL
#CommonCore
<http://t.co/ihX2YfR47J>

@KRISPYMOMMA

@SenTedCruz can you please
repeal #CommonCore
ObamaCORE next our kids
are suffering w the
brainwashing techniques.
Please save our kids...

@KRISPYMOMMA

© CRE 2015 hashtagcommoncore.com

The Common Core as a Threat to Freedom

A number of authors used language that connected the adoption of the Common Core to a loss of freedom or, more insidiously, to a loss of freedom via an increase of governmental control. Thus, the tweet by @gerfingerpoken connects the Common Core to obedience and blind acceptance of authority. The tweet is cleverly constructed to incorporate references to both curriculum and instruction. These are both points of contention, as Common Core supporters adamantly claim the standards are not a curriculum nor do they advocate an instructional approach, while

opponents say these things are inseparable from standards.

The tweet also links to an article about subliminal messages in the choice of Common Core texts.

Both @NealMcCluskey and @occupycorruptDC connect the Common Core to a loss of freedom via governmental control. The @occupycorruptDC tweet adroitly bundles the Common Core with a variety of large-scale centralized government initiatives, including the Affordable Care Act (ObamaCare)

and the National Defense Authorization Act (NDAA). This reinforces the perception of the Common Core as a federal initiative. In the short phrase “BIG BROTHER’S EDUCATION CORE,” @NealMcCluskey links the Common Core to George Orwell’s apocryphal novel, *1984*, about the horrors of totalitarian governmental rule. Using similarly potent language, the final two tweets in this vein connect the Common Core to the indoctrination of children and warn parents to “wake up!”



The Common Core as a Threat to Future Generations

In the final set of tweets, we see how the Common Core is sometimes depicted as a threat to future generations of children. These tweets play off the idea that children are young and therefore susceptible to the messages inserted into the Common Core. They combine both the notion that the Common Core is being knowingly used as a transmitter of an unwanted ideology and that children are vulnerable to the power of these messages.

In sum, metaphors are powerful exactly because they have the ability to bring some aspects of a debate into sharper focus, but they also push other elements into the shadows. However, the power of these metaphors can also be dangerous because they can enmesh their creators in a web of words and image they themselves have spun, and in doing so obscure other realities. While highlighting insights and patterns, metaphors left unquestioned can become distortions that ensnare us.

So what do we make of the cumulative effect of all these negative conceptions of the Common Core? What

is the overarching metaphor that comes from these six powerful themes? Is the Common Core really a giant all powerful brain-sucking monster that will corrode the minds and wrack the bodies of our youth, while scheming to strip away the freedom and liberty of adults? Or are the Common Core just a set of poor misunderstood standards, innocent as a little lamb, encircled by the sharp-teethed political wolves? While they may have started as mere rhetorical devices, metaphors like these and others that are woven throughout the fabric of #commoncore are powerful exactly because, if we repeat and retweet them enough, we become a captive within the logic established by the metaphor.



THE MOTIVATIONS

ACT 4

What motivates different actors to participate in the Common Core debate on Twitter? In this act we present short audio interviews with a small but diverse set of participants in the #commoncore network. These podcasts allow users to explain in their own words their interests, motivations, and positions on the Common Core and how Twitter is facilitating their participation in the public debate.

Visit www.hashtagcommoncore.com to listen to interviews with the following Twitter users.

ANTHONY CODY

Anthony Cody (@AnthonyCody) is a National Board Certified teacher who worked for 24 years in the Oakland Public Schools. Over the last eight years he has become increasingly active in education policy debates. He started a Facebook site called “Teachers’ letters to Obama” through which hundreds of teachers directly wrote to the President about their experiences and challenges. He is the treasurer of the Network for Public Education, an education advocacy group, and until recently, a regular blogger at Education Week. He runs the website called Living in Dialogue. He has been a Twitter member since January 2008.

RED NATION RISING

Red Nation Rising (@RedNationRising) is a not-for-profit conservative grassroots organization founded by Jim Lysaght in the aftermath of Obama’s reelection in 2012. The organization seeks to provide educational information to encourage civics and constitutionalism in physical, digital, and social communities and events. Red Nation Rising has an international following.

DARREN BURRIS

Darren Burris (@DGBurris) is a middle school and high school mathematics teacher and instructional coach in Boston. He has been a teacher for 10 years and is the father of three school-age children. He has been tweeting since 2009.

BADASS TEACHER ASSOCIATION

Mark Naison is a professor of African-American studies and history at Fordham University and Director of Fordham’s Urban Studies Program. He co-founded the Badass Teachers Association (@BadassTeachersA) in 2013. Since then, the grass roots organization advocating for the professionalism of teaching has developed a volunteer network in all 50 states.

SEAN LOUGHRY

Sean Loughry (@SeanLoughry) is the owner of multiple small online businesses and is also a freelance audio engineer. He lives in Pennsylvania with his wife, a teacher, and their daughter. He has been tweeting since April 2008.

TIM FARLEY

Tim Farley (@TFarley1919) is a middle school principal in New York State. He has been an educator for 23 years and a school administrator for the past 17 years. He has been tweeting since March 2011.

KATIE LAPHAM

Katie Lapham (@Lapham_Katie) is a certified bilingual and English as a Second Language (ESL) elementary school teacher in New York City. She has taught in the same school for 9 years, teaching almost every grade level. She writes a blog called Critical Classrooms that provides an insider's look at what's going on in New York City classrooms. She co-created a website called Teachers' Letters to Bill Gates. She joined Twitter in May 2013.

TAVERNKEEPERS

The logo of the Tavern Keepers (@TavernKeepers) evokes the image of colonial patriots meeting at their local watering hole to discuss news and politics. The modern day Tavern Keepers use a variety of social media platforms to disseminate news and opinion. The group has been on Twitter since September 2012.

PETER OSROFF

Peter Osroff (@POsroff) is an award-winning middle school principal from Long Island, New York. Over his 30-year career as an educator, he has been a classroom teacher, school administrator, and school principal.

THE BIG TAKEAWAYS

EPILOGUE

This project is an exploration of the ways in which the networks enhanced by social media are changing the discourse that shapes the political and policy-making environment. By analyzing #commoncore Twitter communications, we have taken both a macro and micro view of the structural communities, their members, and their conversations about the Common Core Standards movement. In the epilogue, the project's authors use their distinct perspectives to interpret the trends in the data and distill the important lessons for participants, educators, and policymakers.

THE BIG TAKEAWAYS

The following encapsulate the major findings from the #commoncore project: How social media are changing the discourse of American politics.

- The #commoncore network represents a persistently active network of public discourse around major education reform in the United States. The analysis for this project focused on the six month period from September 2013 to February 2014, in which we examined 190,000 Twitter postings (tweets) or about 36,000 monthly from 53,000 distinct actors. Our more recent data on the #commoncore network, from April to November 2014, contained over 305,000 unique Tweets from about 81,000 discrete actors, or about 38,000 per month. Debate over this major education reform remains strong and vibrant. [See The #commoncore Dataset; Role of Social Space]
- The Common Core has become a proxy war about broader cultural disagreements over the future direction of American education. [See Politics in the Tweets] As we show in our analysis of the content of #commoncore tweets, very few of the reasons for Common Core opposition have to do with the Standards themselves, but rather are related to other education issues that standards have come to represent, including:
 - » Opposition to a federal role in education, which many believe should be the domain of state and local education policy;
 - » A post-National Security Agency/Snowden scandal belief that the Common Core is a gateway for access to data on children that can be used for exploitive purposes rather than building knowledge to inform educational improvement;
 - » A source for the proliferation of testing which has come to oppressively dominate education;

- » A way for business interests to exploit public education for private gain;
- » A belief that an emphasis on standards reform distracts from the deeper underlying causes of low educational performance, which include poverty and social inequity.

Our analyses surfaced only two criticisms of the Standards themselves, and these were relatively rarely voiced:

- » Claims that the Standards are developmentally inappropriate because they were back-mapped from college- and career-ready outcomes to early childhood expectations;
 - » Critiques that the Common Core focused solely on academic skills and expectations while ignoring equally important social and emotional development.
- Politics makes strange bedfellows. Debate about the Common Core has brought together an ideologically diverse mixture of individuals and groups on both sides of the issue, eager to share ideas, information and opinions in 140 characters or less. Our social network analyses revealed three particular structural communities, one that generally supported the Common Core, one made up of educators who opposed the Common Core, and the third comprising actors from outside of education who opposed the Common Core primarily due to their connecting it to larger social issues. Interestingly, the latter group made up the most active participants using #commoncore on Twitter. [See The Players]
 - A social network perspective revealed a core diverse set of influential actors in the Common Core debate on Twitter. Surfacing the patterns of actual activity and inter-relations Twitter enabled us to look beyond the traditional players in education debates to identify a more diverse set of social influencers in the #commoncore network. Had we just focused on the activity of institutions or other “well known” education actors, we would have missed this group of influential actors who are helping to shape the public opinion that influences politicians and policymakers. This approach also allowed us to identify the most prolific and influential transmitters and transceivers of information in the #commoncore network. These people and groups made up just .5% of the entire network, but contributed 21% of the #commoncore tweets. [See The Players]
 - Social media gives voice to anyone with a web access and a message. The central actors from the #commoncore network feel passionate and broadcast their views about education reform and/or social issues. In interviews, many of them made the point that social media gave them a voice and they had learned how to employ it to gain the attention of more powerful interests such as business leaders, politicians, and public intellectuals. They felt that high profile people and organizations paid attention to their messages because of the networks that they were able to mobilize to share and diffuse their views. [See The Motivations]

- Social media is a conduit for debates on the periphery to enter into the mainstream discussion. There were examples of both genuine debates in the Twitter conversations we analyzed, as well as evidence of the echo chamber effect whereby people share views mostly with those similarly inclined as a way to spread messages and catalyze the base. We also found a strong media presence in the #commoncore network and evidence that the topics, messages, and personas of individual actors are transported from this very particular space into the mainstream via these media members. [See Meet the Transceivers]
- The growth of a social media-savvy network of activists has given rise to a new and influential faction in the struggle for political influence. Facile social media activists, who often participate as a side passion to their regular careers, are now competing with more traditional professional interest and advocacy groups, as well as professional media outlets, for attention on policy issues. This is changing the dynamics of both the making and sustaining of policy. The Common Core issue, like the Affordable Care Act (aka Obamacare), reflects a growing trend of perpetual political debate over issues that are never settled and remain hyper-political even as they are being implemented. [See Crowd-Sourced Political Influence]
- Common Core supporters and opponents use different language to make their points and appeal to their audience. We identified two strains of language in the #commoncore tweets: policyspeak, which evokes logical and rational arguments that tend to appeal to a policy audience, and politicalspeak, which employs more emotional and visceral semantics intended to rouse peoples' passions. We found that proponents of the Common Core used significantly more policyspeak while opponents of the Standards more frequently adopted politicalspeak in their tweets. [See Political Language of the Tweets]
- The metaphors in #commoncore tweets effectively communicate important issues surrounding the standards reform movement, but also distort the reality of the reform. Common Core opponents, in particular, were masterful at using vivid and evocative language to connect the Standards to a range of threats to children and evoke many of the larger cultural touchstones that education reforms often raise. However, repeating and retweeting these messages trapped sub-groups in the logic of those metaphors in ways that obscured other realities of the reform efforts. [See Metaphors in the Tweets]

THE RISE OF CROWD-SOURCED POLITICAL INFLUENCE

by Jonathan Supovitz

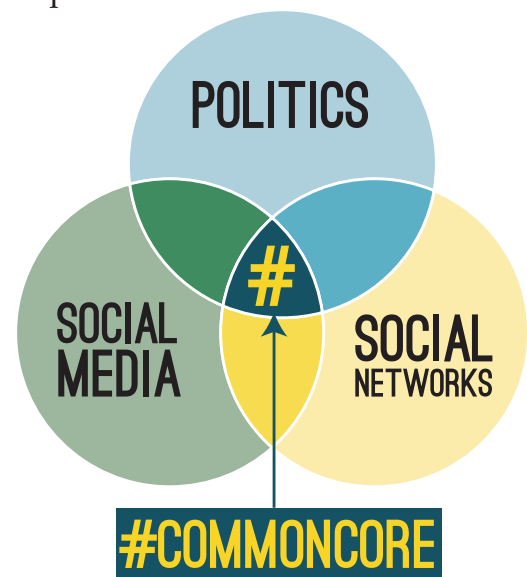
University of Pennsylvania

Consortium for Policy Research in Education

“The medium is the message,” communication maven Marshall McLuhan wrote in 1964, explaining that the means of communication can be even more important than the message it carries. Twitter fits this phrase aptly. Founded in March 2006, some 40 years after McLuhan’s famous utterance, the social medium has grown to over 500 million users worldwide in just over seven years. And we should not think of Twitter as just one entity, because it hosts a multitude of social networks along a plexus of pathways by which users communicate about a vast range of topics. As such a potentially potent resource for connecting people together, Twitter (and other social media like it) raises essential questions about how these technology-enabled social network platforms are changing the practice of politics that initiate and sustain (or not) public policies.

Our investigation of the public debates on Twitter focused on social activism around the contentious Common Core State Standards education reform initiative in the United States. We examined Twitter data from a six month period from September 2013 to February 2014, which contained 190,000 tweets from 53,000 distinct actors. Through our analyses, we examined what the larger Twitter social network looked like over this time period, how the Common Core was viewed by Twitter activists, who were the major players and who they communicated with (i.e. the social networks), and how people communicated (i.e. the language tweeters used). In this essay, I focus on how social media-enabled social networks are changing the discourse in American politics that produces social policy.

Let’s start with the question of influence. There can be no doubt that the Common Core State Standards, adopted with bipartisan support in 2010 in 46 of the 50 states, have become one of the most contentious issues in education today. As one sign of this, longitudinal surveys from Education Next indicate that a 9-1 support ratio in 2012 dropped to 2-1 in 2014. In addition, the decline in support cleaves along political party lines; while Democrats continue to support the Common Core by a 4-1 ratio, Republicans are evenly split.



The Common Core debate on Twitter represents a new phenomenon at the intersection of social media, social networks, and political activity.

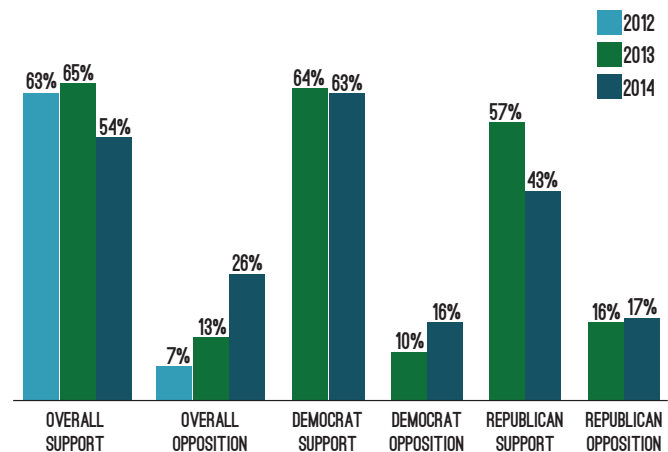
The six-month period we examined in this study occurred in the midst of this precipitous slide in support for the Common Core. During this time there was a steady drumbeat of communication on Twitter about the Common Core, much of which we have documented on this website. Overall, almost 53,000 individuals and groups used the #commoncore hashtag during this six month period and volume averaged more than 30,000 tweets per month. [We continue to track activity on #commoncore, and the volume, as of December 2014, continues to average about 40,000 tweets per month, which indicates that the Common Core continues to be a hot education topic.] So what can we say about the connection between all this Twitter conversation and broader public opinion about the Common Core? Is it just coincidental that the Twitter conversation was rabid at the same time that public opinion was dropping? And how does this affect political decisions, policymaking, and implementation?

Is Twitter an Arena for Democracy, an Echo Chamber, or an Incubator for Influence?

During the six months that we closely monitored tweets, some high-profile Common Core-related events occurred, causing spikes in #commoncore activity. These are described in Content of the Tweets in Act 3. Some of the highest-profile events included:

- In September 2013, the state of Florida, which was the fiscal agent and founding state for the federally funded and Common Core-aligned Partnership for Assessment of Readiness for College and Careers (PARCC) withdrew from the testing consortia.
- In November 2013, Secretary of Education Arne Duncan made his infamous comment: “It’s fascinating to me that some of the pushback [against the Common Core] is coming from...white suburban moms who—all of a sudden—their child isn’t as brilliant as they thought they were and their school isn’t quite as good as they thought they were, and that’s pretty scary” (as cited in Strauss, 2013).
- In February 2014, Bill Gates wrote an editorial in the USA Today trying to dispel some of the myths around the Common Core, which he called “the best way to fix school for our kids.”
- Also in February 2014, Dennis Van Roekel, the president of the National Education Association (the largest teachers’ union in the United States), called for a course correction of the “botched implementation” of the Common Core.

TRENDS IN COMMON CORE SUPPORT 2012–2014



Source: Education Next Survey

Each of these incidents attracted huge attention on Twitter as well as in the popular media and played into a growing perception of the Common Core as a beleaguered education reform. But the incidents were also important because they helped create and play into a particular narrative, forming the themes in our analysis of the Twitter data.

By leaving the Partnership for Assessment of Readiness for College and Careers (PARCC) assessment consortia (for which it was the fiscal agent, no less) – Florida became one of the first states to act on within-state opposition to the Common Core. This action emboldened politicians (largely, but not solely, Republicans) in other states to oppose the Common Core and reverberated in places like Indiana, which dropped the Common Core in April 2014; in Louisiana, where Governor Bobby Jindal and 17 legislators sued the State Board of Education to stop Common Core implementation; and Michigan, where the state senate overcame some tense moments before voting to continue to use state funding on Common Core implementation.

Duncan's gaffe was important for two reasons. First, it perpetuated connections between the Common Core and the federal government's role in education. While the creators of the Standards were careful to point out that the National Governors Association (NGA) and Council of Chief State School Officers (CCSSO) were its sponsors, the federal government had used the substantial resources of the American Recovery and Reinvestment Act of 2009 (ARRA) and Race to the Top (RTTT) funding to provide incentives for states to adopt the Common Core and funded the development of the two Common Core-aligned tests. All these events contributed to the perception that the federal government sponsored the Common Core State Standards. Second, Duncan's awkward comment reawakened fears about drops in performance when the results of the first Common Core tests are released in the summer and fall of 2015. Would middle-class Americans, who consistently rate their own child's school as above average, be so shocked by drops in performance that they would press for a pull-back of the raising of performance expectations that reduced tests scores would imply?

Bill Gates and his foundation have come to represent the business interest in education, leaving many suspicious because they fear profit-seeking will trump the public good. Gates has become a magnet for Common Core opposition because the Gates Foundation has spent over \$200 million on Common Core support and advocacy (Vicens, 2014, Sept 4). Even though the Gates Foundation and Microsoft are distinct and separate entities, many opponents view these dollars as an investment in the education technology market where a range of vendors are sure to profit as educational and testing resources are increasingly available on-line.

Finally, Van Roekel's comment reflected an increasingly tense relationship between teachers and the proponents of the Standards. Initial widespread teacher support for the CCSS has become muddied by conflation of standards implementation and teacher evaluation, particularly in states which received federal RTTT funding, and by teacher

frustration with both the increase in testing and the misalignment between old tests and the new standards.

Thus, each of these events poked a sensitive nerve in the soft underbelly of education reform.

Yet these events, even while reverberating throughout the Twittersphere, were also national stories in the mainstream media in their own right. Florida's announcement, made by Governor Rick Scott, was sure to garner national attention. Duncan's suburban mom comment was covered in the *Washington Post* (Strauss, 2013, Nov 16), MSNBC (Richinick, 2013, Nov 21), and *Politico* (Simons, 2013, Nov 18). *New York Times* editorialist Frank Bruni (2013, Nov 23) wrote a column about it. Bill Gates's editorial in *USA Today*, dropped in front of many a hotel room door in America on that cold February morning, was intended for a broad audience.

The interrelationship between social media and the popular media, however, remains ambiguous. Just what is the directionality of influence? Are beliefs being fomented on social media and moving out into the mainstream? Are ideological segments of the popular media (FoxNews, MSNBC, Bill O'Reilly, Glenn Beck) feeding stories into Twitter both directly and through their followers, which are then tweeted and retweeted out across the social networks, taking on different interpretations as they go, like the old chain game of telephone? Are the same events and issues refracting out through all forms of media more or less simultaneously, with each subgroup interpreting them with their own lens and reporting them with different tenors for different ideologically inclined audiences? Is social media influencing mainstream opinion? Is sub-stream opinion influencing social media? Both?

In our analyses of #commoncore we found evidence for at least three explanations that help to make sense of how the cacophony we observed on Twitter might be working its way to influence public perceptions. The first possible interpretation is that Twitter is a distinct venue where people debate ideas to decide their positions on the merits – an arena of democracy. There are numerous examples in the tweets where two or more people were not just parroting others' views, but mentioning each other and have a discussion about a Common Core-related topic. Further, in interviews, some of the elite actors talked about discussions they had via Twitter in which others that influenced their views.

A second possible interpretation is that Twitter is an echo chamber where people reinforce the beliefs of those like them to get affirmation for their previously-held views and, in doing so, amplify the prevailing conception. The structure of the three factions that emerged out of the social network analyses in Act 1 provides credence to this notion of homophily, or the tendency of people to affiliate with like-minded others. This is a continuation of the pattern that emerged when cable television grew out of broadcast TV in the 1980s and began to splinter into more specialized political shows catering to particular partisan views (see *Evolution of Media in Politics*). Similarly, on Twitter,

particular groups with similar political convictions tend to follow, retweet, and mention the views of like-minded others.

The third possibility is that the fomentation of debates on Twitter acts as an incubator for influence whereby the buzz from often sensationalized Twitter messages seeps out into larger social networks that connect to public perception. In this view the echo chamber is not hermetically sealed. One piece of evidence for this is the presence of media members in both the transmitter and transceiver networks, who acted as conduits for Common Core information to travel through their own journalistic networks into the mainstream. A second piece of supporting evidence was how interviewees mentioned that their tweets were quoted in mainstream media outlets and that they were sought after to do interviews with the mainstream media. This may even signal the onset of a blurring of the different types and sources of media.

These explanations are also not mutually exclusive and it is plausible that all three of these phenomena are at play simultaneously. Twitter can be an arena for democracy, an echo chamber, and an incubator for influence all at the same time. And perhaps even more importantly, as we are starting to see the ways that the Common Core debate has trended over time, this new mixture of political activism on social media that spurs robust social network activity is changing the way that politics and policy interact.

A New Policymaking Environment?

The interrelationships between politics and policymaking are complex. Coalitions arise around a perceived problem or need in society and foster a constituency to address it. These alliances are often fluid. The priority for any particular action rises or falls due a host of factors, including the grit and determination of key actors, the particular combination of allies, and unpredictable external events and circumstances. In such a milieu, the Common Core State Standards movement arose from the end of the test-based accountability era of No Child Left Behind, the ongoing dissatisfaction with national educational performance, and long-simmering angst over persistent national inequalities and comparative international mediocrity. These factors and others coalesced into the search for the next great policy lever to pull, which turned into a fast-track effort to resuscitate and enhance past standards-based reform efforts. The effort looked like smooth sailing through the early part of the 2010's, as state after state adopted the Common Core. Since that round of adoption, however, the sea has grown choppy.

In some ways the fractious rabble-rousers on Twitter are a counter-ballast, or even a reaction to, the increasingly slick sheen of professional media advisors and image consultants that have turned public issue advocacy into a business model. We found no single group or entity orchestrating opinion on Twitter. The closest to it was the Fordham Institute's gang of Common Core supporters, which used a team of Fordham staff (Michael Petrilli, Michelle Gininger, Michael Brickman and their blog (The Education Gadfly) to retweet each other's tweets. Far more commonly, the pulsing of messages that occurred

ubiquitously in all three of the structural factions that made up the #commoncore network were reverberated through loosely affiliated networks of individuals and groups who shared common beliefs, but were not operating in concerted campaigns.

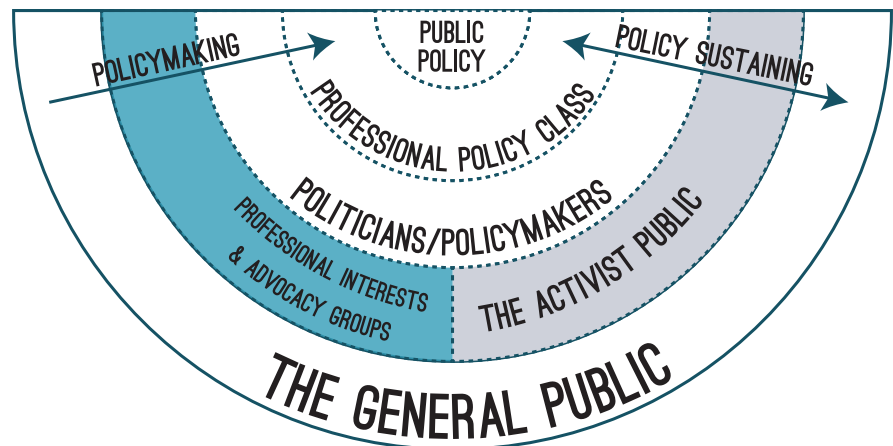
At this stage of the evolution of education issues on social media, the organic nature of Twitter messaging is in sharp contrast to the more coordinated activities of professional advocacy groups on either side of the Common Core issue. While these groups had some presence on Twitter, they were support players in the debates rather than dominant actors. From this perspective, social media-enabled social networks bring a new dynamic so the factional tussle for influence in American politics and policymaking.

The influence of factions, and the advantages this splintering produces for special interest groups in shaping public policy, is as old as the nation. In 1787, writing under the pseudonym Publius, James Madison wrote Federalist Paper #10, which acknowledged the importance of factions in vigorous public debate, but grappled with how to control their tendencies to seek domination at the expense of the public interest. For Madison, the checks and balances built into the American system were at least in part due to his conclusion that “...the causes of factions cannot be removed and that relief is only to be sought in the means of controlling its effects” (pp. 77-88). As America has long protected the right of factions to advocate in American politics, it has also struggled to limit their supremacy over the policymaking process.

Most of the recent attention to factions seeking to influence policymaking has come in the form of debates about the increasing role of money in politics. We all know how important money is to trumpeting a message. In fact, the main critique of the Gates Foundation in the #commoncore network is their contribution of \$200 million to support Common Core advocacy groups and public information campaigns in a variety of ways.

But another important lesson from our analysis of the Common Core debate on Twitter is that social media-enabled social networks are an increasingly potent force for gaining the attention of policymakers both by communicating to them directly and by raising enough noise and attention through crowd-sourcing grassroots energy to influence both media coverage and public opinion that gains their attention. The prime examples of the rapid ascent of grassroots organizations active in the #commoncore network which have no infrastructure and are entirely run by volunteers are the Bad Ass Teachers Association, which in two years has accumulated 39,000 followers in 50 states and is run by 245 volunteers; and Red Nation Rising, which accrued some 37,000 followers in its first six months and claims to have made nine billion social media impressions. These groups arose with no money and no organization other than a volunteer social media manager who tweets from her phone. Based upon the entire #commoncore social network and these vivid examples, I argue that social media-enabled social networks are shifting the dynamics of factional politics in American policymaking.

In the figure to the right, I depict the different groups that contribute to making public policy, at the center of the image. Layered closest to policy are professional policymakers, who may be policy staffers, or career legislative assistants who actually craft the details of a policy itself. Depending on the complexity of the policy, this group may or may not play a major role in policymaking. Adjacent to them are politicians who, once elected, are the creators of policy. The next (shaded) ring, contains advocates who either support or oppose a policy, or who desire a particular rendition of a policy. I have highlighted this ring because it contains the main actors of the #commoncore story, and I will return to it in a moment. The final ring of the semi-circle is the general public. The rings are depicted as dotted lines to signify that the relationships and flow of information among these layers of the process are porous. All of these rings together contribute to the policy making process, for they all exert pressure and inform the development of policy in different ways and by different means.



The uni-directional arrow on the left of the image indicates that policy making usually moves towards the center. While it may not start with pressure from the general public, it is usually interest groups that are pressing on politicians which results in the development and enactment of policy. While there is certainly back-and-forth in this process, the forces that produce policy generally move toward the center. The bi-directional arrow on the right of the image represents the fact that, once a policy is made, the process does not end. The constant agitation against enacted policy—made far easier by social media—means that no policy is safe from modification or elimination.

Returning to the shaded ring, which consists of professional interest groups, advocacy organizations, and increasingly with what I call “the activist public.” The activist public includes those individuals and grassroots organizations who have gained increased visibility and influence in the social networks on Twitter, as measured by their presence in the elite transmitter and transceiver networks (see Act 2, The Players). The influence of these individuals and groups is based upon how well-connected they are in social space and their ability to use social media to spread their views. There are many examples of these actors in the #commoncore network, including many of the individuals and organizations who are active on Twitter in all three structural factions (the yellow, green and blue factions discussed in Act 2). Examples of individuals include professional educators like DG Burris, Peter Osroff, and Tim Farley; groups outside of education like the Tavernkeepers and Red Nation Rising, and groups inside education like the Bad Ass

Teachers. These individuals and groups represent a new and vocal set of influencers on the policymaking process who use social media as a democratizing megaphone to amplify their collective voice through their social networks.

The activist public is jostling into the space largely dominated by the professional interests and advocacy groups who have been the primary influence on public policymaking for the last several decades. While professional advocacy groups (like Cato Institute, The Pioneer Institute, The Fordham Institute, the National Education Association, the American Enterprise Institute, the Heritage Foundation, and several state public education funds) are present in the #commoncore network, they are generally less active than members of the activist public.

While it is beyond the scope of this project to judge the relative effect on public policy of the professional advocacy groups relative to the activist public, it is clear that the social media-fueled activist public is a relatively new phenomenon in the policy space, and has garnered tremendous attention among both policymakers and the general public. As a supporting anecdote, I have attended several education policy meetings where elected officials and members of the professional policy class have commented on the clarion voice they hear coming from the activist public. So either the activist public is expanding its influence as a faction in education politics or they are elbowing into the space heretofore dominated by professional advocacy groups. Either way, they are beginning to change the dynamics of the political process by which policies are produced and sustained.

As astonishing as the story of the Common Core as told through #commoncore activity on social media may be, it is really just the beginning. Twitter activity is a harbinger of social media's increasingly powerful influence on policymaking to come. We shall look back upon this as a nascent era of a series of skirmishes across social media-enabled social networks in the cat and mouse game for influence over the messages that help mold public opinion that politicians/policymakers cater to. In this early era, crowd-sourced political influence is acting as a counterbalance against organized and corporate interest-funded advocacy groups. We may soon see the better-established social media sites increasingly hegemonized by more organized professional advocacy interests who seek to use their well-resourced influence to shape opinion. In the ongoing struggle for political influence and advantage, social media-enabled social networks are an undeniable force.

THE ROLE OF ACTIVITY AND SOCIAL SPACE IN THE #COMMONCORE NETWORK

by Alan J. Daly

University of California, San Diego

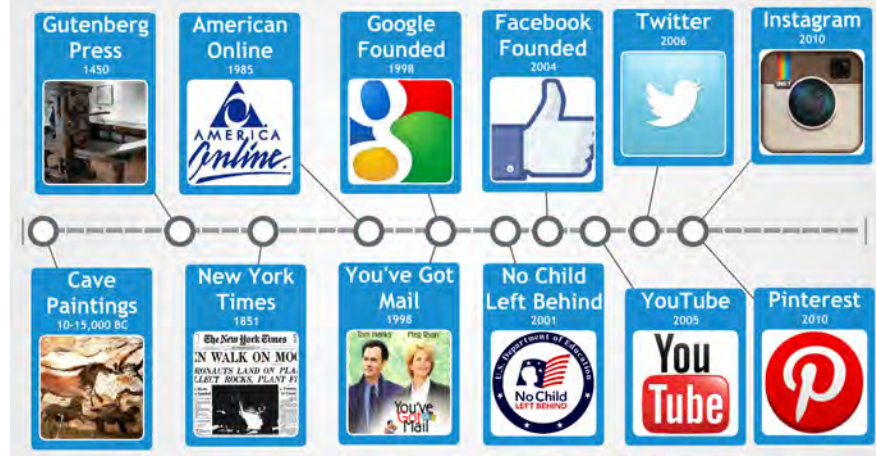
Introduction

Some experts estimate that the amount of new data generated every day is 2.5 quintillion bytes.¹ Now for those of you, like us, that have trouble grasping that number, it is equal to 10 to the 18th power. OK, that might also not be so helpful, so let's consider the following estimates: From the beginning of the dawn of recorded time (we think big at the #commoncore project) until now, we human beings have generated about 5 billion gigabytes of data; in 2011, that same amount data was created nearly every two days; and in 2014 the same amount of data is produced about every 10 minutes, 75% of which is generated by individuals.² Much of the data comes from the social media space (e.g. Twitter, Facebook, Instagram, and YouTube) that includes cat videos, selfies by Kim Kardashian, and Yelpers telling you to avoid Big Jon's Burger and Plutonium Emporium. Much of this data ends up in your inbox, leaving you with some strange mixture of emotions that range from annoyance to joy. The scope of this data is overwhelming and ever-present—and in many cases not very useful. However, there is some data gold in them thar hills, and in the #commoncore project, we attempted to take a very small piece of an enormous set of data to make sense of what often remains invisible to us despite its potential to be consequential or at least interesting.

Although it seems social media and activity on the Internet has been ever present, consider this—the last major federal education policy, No Child Left Behind (NCLB), was rolled out just three years after Google's founding. However, what is more extraordinary is that NCLB was up and rolling 3 years before Facebook was liked; 4 years prior to YouTube discovering kittens were cute, 5 years after Twitter first tweeted, and 9 years since Pinterest saved a marinated Armadillo recipe and Instagram captured the photo of the culinary delicacy that is the Armadillo. For the first time in big education policy history, social media is a player in a way that was unprecedented—and so while “media” has been around, it is the “social” modifier that captured our imaginations. The figure below captures the evolution of media over the last few 10s of thousands of years (we told you we think big at #commoncore).

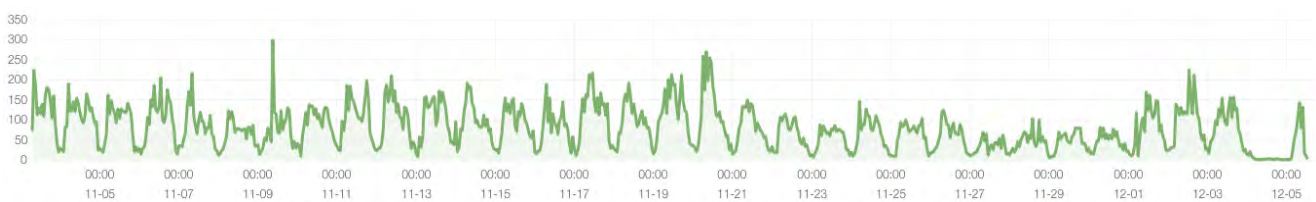
We undertook this project because we are interested in issues and their impact on educators and students across the country. We also took a social perspective, as our experience suggests that educational systems and actors within those systems are often treated as independent units. Typically, educational institutions and support agencies

have not viewed themselves, either as organizations or individuals, as part of a larger interdependent and interconnected system or network. This failure to recognize and embrace the idea that decisions, actions, and inactions are mutually influential and consequential has perhaps inhibited our collective ability to both



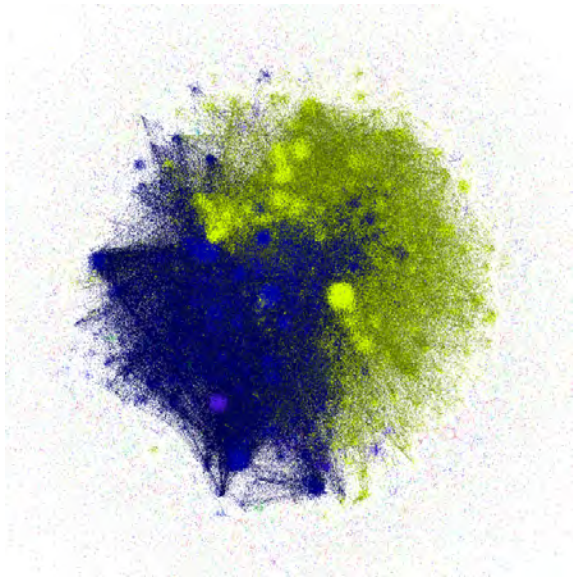
understand and address pressing issues that have for far too long plagued education—that’s my story and I am sticking to it. It is from this standpoint I reflect on the insights gained from viewing this project through a social network lens. I unpack the perspective and suggest the importance of exploring social and activity space as a way to understand how policy is understood and framed. I lead with four key ideas that arise from our data to frame the overall argument.

The first finding from our work is that the #commoncore network reflected a consistent social and active network of Tweets and exchanges not only throughout the span of the project, but well beyond. The graph below supports this point and reflects the consistent #commoncore activity from November and December 2014 as a way to demonstrate the activity of this network even during the holiday season and for that between mouthfuls of turkey, we gave thanks for the thumb, 140 characters, and the 7/11 open nature of the Internet.



The overall high level of social activity around the CCSS was impressive particularly given its consistency and longevity over the course of the six months of the project. As we show above its activity also outlasted the ugly holiday sweater contest season. Our recent analysis of new data from April-November 2014 indicated over 305,000 unique Tweets, or about 38,000 per month, reflecting about 81,000 different actors. The figure below graphically portrays the ongoing connectivity and network of connections that have continued in the #commoncore network.

In addition, we identified an increasingly bifurcated/polarized network from the Tweet activity with our original three factions merging into two main structural groups (indicated by blue and yellow above). This network structure based on Tweet activity reflects the



merging of factions to form 2 clear structural communities. This pattern of interactions making up the new network structure may reflect a calcification of positions and opinions and even more clearly drawn cultural battle lines. We will be exploring this preliminary finding as well as many others in the next evolution of the #commoncore project—so stay tuned. In sum, the #commoncore continues to be as active as when we studied it in 2013-2014. #commoncore also remains the most actively used and tweeted hashtag connected to the Common Core State Standards and provides an opportune virtual locale for examining social and activity space.

Second, evidence from the project suggests that the pattern of interactions captured in the activity of tweeters to #commoncore reflects a larger interdependent social network. In the #commoncore project we found a high rate of interconnectivity and sharing of ideas, knowledge, and opinions from users on Twitter that created a massive social network. The total network included about 63,000 actors, and of those 63,000, 53,000 of whom interacted with multiple other actors over time, creating a dynamic set of activity exchanges across and between users. The network remained alive and grew even more dense over the course of the project, suggesting the robust nature of the network.

Third, the activity inside Twitter around the #commoncore resulted in separate and overlapping structural factions. These factions based on the social activity of the actors and resulted in three distinct and overlapping groups. We did not “pre-assign” these factions a priori based on attributes of the individuals, rather we let their interaction activity on Twitter determine the group to which they belonged and then used that data as the starting point to identify actors and beliefs within those communities. In this way we intersected the idea of activity and social space to better understand the interactions between and among Tweeters. Our deeper qualitative analysis suggested that these factions shared similar belief patterns and at times were often echo-chambers.

Lastly, we found a variety of actors that typically are not considered in the policy discussion coming to the fore. Our analysis identified influential actors based on not only their Twitter activity, but interactions with others within the #commoncore network creating a mix between activity and social space. This interaction created a system that was not based on self-report from individuals, but from a careful analysis of the interaction activity patterns within a specific social space (#commoncore). This analysis yielded a number of individuals that were predictable in the space (educational professionals and institutions) as well as a number of other folks who do not show up in typical “education policy circle” analysis, and yet these actors were highly active and influential in diffusing

their beliefs and opinions. The network approach to the analysis enabled us to identify and interview actors that both played an important role in this network and are traditionally overlooked in much work. Our work illuminated subgroups and individuals that often are in the shadow of their educational professional/institution peers, who while often not identified nonetheless played important roles.

The sum of these four points reflects our thinking that “space” extends beyond physical geographies to encompass the idea of activity and social geographies. Further, in more deeply understanding political and opinion climates surrounding a large-scale educational policy drawing on different perspectives enhances our understanding of such complex phenomena. Now the stage has been set based on evidence from the #commoncore project, in the next section I will make the broader argument for the need for creating maps of social geographies in undertaking policy work in this new social media world.

The Role of Activity and Social Space

At its heart, the work presented in the #commoncore project is based on the proposition that activity in social space produces complex systems that are situated in networks of interactions and interdependence. In our work we have examined the both the activity and social structure of these relationships as enacted on Twitter as well as the quality of the interactions within this social media space. In this manner we privileged social interactions and relationships as the starting point of the analysis. This represents a departure from how many projects are undertaken. Typically, policy studies draw on attributes of individuals, their formal positions or even some outcome measure, and then undertake a line of inquiry and analysis of which relations may be a part. In this project we flipped that idea and started from the constellation of interactions, thought of as a kind of social behavioral activity, and then moved out into concepts such as individual attributes and formal roles. In this manner, we let the social behavior of the actors drive our analysis as opposed to what we anticipated the activity might be based on individual level attributes. At this juncture, lest the reader think we are discounting individual attributes and affiliations, to be clear we see the social and individual perspectives to be complementary each bringing something to the understanding party.

As suggested above, we found the activity of these relationships to be important at the dyadic (pair), faction (group), and system (entire network) level. As such, we have come to the conclusion, as has a growing group of folks, that the larger social milieu in which individuals communicate and interact is important and an important starting point, so the question becomes: How do we bring into awareness a deeper and nuanced understanding the ubiquity of these complex activity patterns of interactions in social space? Our work suggest the importance of redefining areas of focus and perhaps even fundamentally shifting from dedicated work on lone individuals/institutions and their attributes to exploring the larger systems in which individuals engage around policy and practice as well as well as provide insight and at times insanity.

The science behind these ideas is both solid and evolving. The work is grounded in social network theory and analysis. Contemporary social network theory and analysis has been argued to have been formalized in the 1930's with the work of Moreno (1934), who termed the field "sociometry," as discussed in the prologue. The key idea from this work is that one's position in a social structure has consequences for that individual was foundational to the rise of subsequent research in social networks and the #commoncore project. The balance of network research demonstrated in slightly different ways that the structure of the network and an actor's position within that network were consequential to the overall network as well as the individual.

Social network theory provides insight into how the social processes involved in communication and diffusion of ideas/opinions are stretched across individuals and levels of a system (Daly, 2010). Social network studies primarily focus on how the constellation of relationships in networks may facilitate and constrain the flow of "relational resources" (attitudes, beliefs, knowledge, materials, etc.), as well as providing insight into how individuals gain access to, are influenced by, and leverage these resources. The network perspective does not supplant the importance of individual attributes in understanding the selection, interpretation, and use of data, but rather offers a complimentary perspective and set of methods for better understanding the dynamic influence of social processes.

Rather than trying to understand the world based on the attributes of an actor (gender, years of experience, training, education, beliefs, formal position etc.), we focused on the influence and outcome of an individual's position vis-à-vis social ties with others, as well as the overall social structure of a network. In many cases, social network theorists suggest that the underlying social structure determines the type, access, and flow of resources to actors in the network, leading some scholars to suggest that the old adage "It is not what you know, but who you know," would more accurately be "Who you know defines what you know" (Cross & Parker, 2004). We would extend that idea to argue that for the #commoncore project, our findings suggest that beyond knowledge; beliefs and attitudes are socially influenced and spread particularly in tightly knit factions.

The idea of interdependency is central to the #commoncore project. Social embeddedness, in a network sense, refers to the nested nature of relations in a network (Granovetter, 1985). In a social network, individuals are embedded within pairs of relationships, and these pairs are embedded in larger groups of three, four, or more individuals that eventually form a social network. Even a social network itself is embedded in a larger social structure, for instance a community or a country. Social embeddedness also implies that changes at a single level (e.g., the pair) will have consequences for a higher-order level (e.g., the whole network) and in turn the larger structure of the network influences an individual's ability to access resources. As such, the significance of the pair extends beyond just those two individuals into a system of connections. It is through better understanding this larger interconnected and interdependent network that we argue large-scale policy can be better understood.

The concept driving the work in #commoncore is a more relational approach to studying systems surrounding a large-scale policy. Moving this more interactional perspective forward means that we need to move beyond vestiges of an industrial, mechanistic age in which people were viewed as only playing a formal and predictable role to viewing the world as a larger, interconnected and dynamic system. Conceptualized broadly, the idea is an intuitive one. Relationships matter in a very central manner to the ways in which information, knowledge, and opinion are moved. Therefore the work of understanding policy is at its core social work. We are social beings and that sociability continues whether we find ourselves in a universe of sand and sky or in a Twitterverse comprised of bits and bytes.

Social Influence and the Collective

We live in a social world and as such are deeply affected by others, sometimes in ways of which we are unaware. Recent research suggests that our happiness, health, weight, and even wealth are influenced by the social networks in which we reside (Christakis & Fowler, 2009). These connections are not just direct ones, but even those individuals who are two steps away from us have influence. However, despite this we still tend to draw on a variety of formal structures and processes to understand our worlds. However, while these more technical approaches are important and have been well documented, what appears to be generally missing is the power of the relational linkages between individuals that, while consequential, is often invisible. Therefore, examining both the quantity and quality of social ties between and among individuals in social media space is important.

We identified several key opinion leaders in the #commoncore network. These key opinion leaders are individuals that through their individual constellation of relations exerted social influence in getting their perspectives, ideas, and approaches to take hold and spread. These individuals can be thought of as trend-setters or policy whisperers (OK to be fair some shouted) that also have the ability, through their extensive ties, to socially influence others—not necessarily through bombarding with messages, but through being recognized by others and having their ideas spread. We found these policy whisperers were not always the most central individuals in a social system; in fact they were often typically well connected to connected others. In this sense we can think about these key opinion leaders as not necessarily the obvious king/queen, but the kingmaker/queenmaker. These individuals were important in the social space as they were able to diffuse their opinions/ideas, sometimes in ways that are far more effective and efficient than others. They were also not always the most obvious actors.

The importance of the relationship between the individual and the larger collective system can be represented in some interesting work that has been done around the concept of collective intelligence. Collective intelligence is an emergent property that comes about through synergies of collaboration and collective efforts. As a way to illustrate, imagine a jar of jellybeans and a lecture hall filled with undergraduates. The task of the undergrads

is to guess the number of jellybeans in the jar. It turns out that individually, students are pretty bad at guessing the right number of jellybeans. However, if one was to take the average of their guesses, this answer is often a better guess than any one student can make, no matter their individual ability to make guesses about jellybeans. This is an important idea that suggests that the collective is in fact more intelligent than any one elite individual. Now of course in the real world, the guessing of jellybeans seldom is consequential. However, the idea of the collective and crowd-sourcing has been used by medical researchers in better understanding the misalignment of strands of DNA. The researchers provided the rules of the way that DNA must be ordered, and gamers, having no formal training in the science, collectively arrived at better outcomes than the best individual researcher or computer models. In this sense, the network of gamers provided insights that an individual expert or even technology could not offer. In the #commoncore project, we were able to gain a larger and arguably more informed picture of overall beliefs and opinions about the CCSS than if we investigated just one group of individuals—in this way, we attempted to draw deeper understandings from the larger collective to seek a meta-perspective on this robust and active network.

Our ability to actively interact with others, network, and draw on collective systems is of critical importance as we move deeper into a knowledge economy in which collaboration, social skills, and leveraging interdependent social networks are increasingly important, necessary, and hold potential economic/social/political/cultural value. Better understanding of newly evolving concepts and findings from network science and beyond are important for adding to our knowledge and building our own individual and collective ability to learn, lead, and understand processes of large scale policy implementation. This project suggests that the work of the 21st century is not only about facts, figures, and rote learning, it is about the generation of intellectual capital and the creation, development and management of knowledge and opinion as it exists in multiple complex and dynamic arenas. Approaching the work of education politics and policymaking as a system of relations recognizes that while the individual is important, it is the system of interactions amongst individuals that is equally informative. A social network perspective reveals the consequential interactions that are hidden in plain sight.

¹ Estimate from IBM Big Data project

² Estimate from Wikibon.org

WE ARE THE MEDIA: THE ONGOING DISRUPTION OF SOCIAL SPACE VIA SOCIAL MEDIA

by Miguel Del Fresno

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Speed and Complexity

The history of mankind is unthinkable without technology. In the Internet age, where real time dominates over geography, web 2.0 and the rise of social media communication is another example of the exceptional ability of people to collectively communicate meaning and ideas. We tend to believe in the uniqueness of each era and its relationship with technology because the social changes resulting from innovation have always triggered changes in society. These changes not only support the conditions for technology to be created, but also change how people engage in interpersonal relationships (consider the telegraph to the telephone to the smart devices). One of the substantive features of how technology is collectively experienced is the speed at which technology pushes communication, at the same time as it is concentrated in shorter time spans.

These uninterrupted technological spans have been presented as a gradual extension of our senses, leading some early thinkers to note, “we have extended our central nervous system in a global embrace, abolishing both space and time as far as our planet is concerned” (McLuhan, 1964). This means that new media and technologies are transforming not only the “how” of communication, but the “meaning” of what is being communicated. This process of reorganization and expansion has broadened the collective interpersonal communication system, which has had an effect on the reconfiguration of social reality itself. The Internet and its evolution is the most disruptive contemporary social-technological phenomenon on interpersonal collective communication in history.

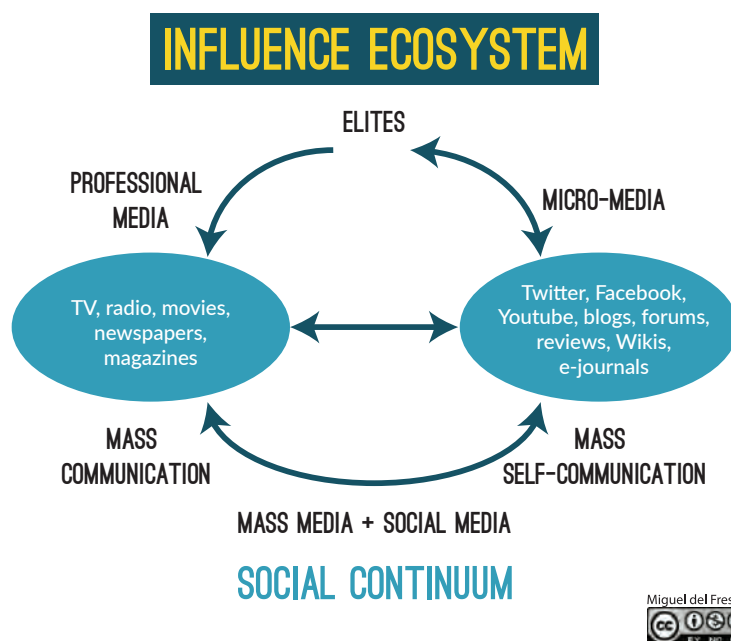
Social media allows the rise of an evolution of a new and complex influence communication ecosystem in contrasts sharply with traditional, primarily vertical, mass media communication, which is becoming more limited in its ability to synchronize general perceptions. The Internet allows for mass social media communication that also simultaneously provides for the emergence of micro-media. Anyone with a simple technological tool (a mobile phone) and Internet access can be a real time broadcaster competing for reach and notoriety with the professional media. The old saying in journalism was that you could have the biggest scoop in the world, but if you don't have a way to get it out, it remained the biggest secret in the world. Now that notion is dead. Today everyone has a personal technology device to get out the big secret anytime, anywhere. Everyone can be a journalist.

Additionally each of us in micro-media space can simultaneously be active and passive receivers, transmitters, and diffusers of information, rumors or symbolic meaning. These micro-media communications can be self-generated as well as passed along from others; they include material from the mass and micro media. As result the communication ecosystem can simultaneously contain without any trace of contradiction noise and signal, truth and lies, virtue and vice, news and rumors, the original and duplicate, voyeurism and exhibitionism—all within the same bold universe of inclusiveness.

We, the New Media

It is in this new micromedia space—the Twitterverse, the infinite YouTube playloop, the rabbit hole that is Facebook—that the movement from “other” as media to “we” as media is coming about. For a long time

the unidirectional communication media professionals controlled by elites pursued the symbolic and informational control of societies or large parts of that society. Mass media messages were the only game in town and they owned both the message and the means of communicating that message. Micro-media has the dual property of being both part of the medium as well as part of the message. Within a mass self-communication system, micromedia are able to extend messages from and to others (peers or professional media) through a multidirectional communication system. This system reflects individual (one to one) or social (one to many and many to many) interactions without the imposition of any agenda from the larger professional media.



The new influence ecosystem arising from the emergence of micromedia is modeled below. It illustrates how the professional media have been forced to cohabitate with micromedia. The traditional, vertical influence system, with its ability to synchronize perceptions on a massive scale, has been significantly disrupted by social media and mass self-communication. Micromedia now plays a significant part in the battle of social perceptions, influencing beliefs and diffusing opinion.

In the influence ecosystem, the changes in collective interpersonal relationships, due to caused by the emergence of Internet and social media haves created a hybrid communication sphere. Professional media and social media are combined in a unique system, with offline and online contexts existing in the same social continuum. There are

no social, methodological or ontological utility to maintaining a differentiation distinction between the two in the new hybrid social continuum this new space. The research place is not the research object, because where things happen is less important than what is happening—especially when we are looking for understanding at the intersection between society and technology as well as between human behavior and technological change.

This hybrid, all-media space forms a labyrinth linking people who share information, news, perceptions, beliefs, and rumors in a real-time, immense, networked communication system. The result is that everything—people, information, events, and places—are connected, creating a vast aggregate social network. In our work we drew on social network theory to provide a useful conceptual framework and robust set of methods for both understanding, analyzing, and representing the pattern of social networks interactions that surround individuals in the #commoncore Twitter’s opinion climate.

Making the Invisible Visible

As we have shown in this project the expanded social context of the Internet and social media through Twitter gives rise to social networks on any number of topics and social behaviors. Unlike the mass media, which is a professional communication tool, social media is a collective and interpersonal communication mechanism, which has created an unprecedented unique social continuum, where offline and online social interactions are individually and collectively, local and globally experienced in real time.

Given the mind-boggling amount of data streaming through this network, it has been difficult to chart the complex relational structures that emerge online in networks like #commoncore, because the robust size of the data makes climates of opinion on organizations, media, individuals, companies, institutions, and lobbies difficult to comprehend. Such can be best typically be represented and studied through computer programs and visualizations of information. Through an innovative set of methods in this project we captured, mapped, and analyzed Twitter’s interactions as social networks in a depth and scale that has recently just become possible for the average citizen. This work make the invisible forces of interaction visible and accessible to a wider audience.

The relational data captured from social media offers many new opportunities to understand communication practices in the social media space. In other words, new types of communication networks and new media like Twitter vastly increase our ability to understand complex social and communication problems and the rise of a new kind of influencers.

From our point of view as researchers, one of the most valuable aspects of Twitter is its evolving nature as a sort of central nervous system of the Internet, playing the roles in practice as a media of intersection of every social and professional media. Like in any social space, some people will be disproportionately influential in the system—they can be thought of as opinion leaders.

Social Media Influencers

Opinion leaders tend to be identified as nodes for the diffusion of new ideas or behaviors based on the premise that once they have been properly identified, they may act as change agents. It is also possible to identify key nodes in networks to prevent the diffusion of errors or misbehaviors. The real existence of influence inequality can be explained not as a result of who we are, but rather to whom we are interconnected.

Social media influencers (SMIs) are the independent players who shape audience attitudes through the use of social media channels, both in competition and coexistence with professional media. Being able to accurately identify SMIs is critical no matter what is being transmitted in a social system. SMIs can be identified by their high-ranking position in a network as the most important, or central, nodes.

Our social network analysis of the #commoncore presents a social media network analysis on Twitter of activity surrounding the Common Core and reveals the existence of different typologies of SMIs elites (we called them transmitters, transceivers, and transcendents) interacting in a highly complex information ecosystem of ideas. By analyzing Common Core opinion climate, we identified ways that social media is reactivating in a powerful way the link between citizens, social debates, and politics.

The Common Core debate on #commoncore is an exemplar of the ongoing disruption of social media, and how the traditional exclusivity of mass media is quickly becoming outmoded, outdated, and outstripped by the rise of social media. The mass media creation and distribution of meaning, perceptions, and beliefs reflecting the agenda of the elites is being challenged and refuted by the fast-moving thumbs and fingers of all walks of life, the “we” enabled with our ubiquitous devices, multiple points of contact, and the “viralization” of news, ideas, or opinions. At the same time this new breed of social interaction offers the opportunity to reactivate the link between society and politics, creating a potentially democratizing collective tool.

METHODS

This section provides a detailed discussion of the methods used to arrive at the conclusions in *#CommonCore: How social media is changing the politics of education*.

TWITTER DATA

Twitter (<http://www.twitter.com>) is a free online global social network that combines elements of blogging, text messaging and broadcasting. Users write short messages limited to 140 characters, known as *tweets*, which are delivered to everyone who has chosen to receive that user's tweets. Within each tweet, it is possible to include links to other media or to embed video, images and hashtags (a word or a phrase prefixed with the symbol #).

Twitter users can interact and communicate in different ways, and users are finding new and creative ways to get the most out of each tweet. First, they can write simple messages, called **tweets**, adding images, videos, hashtags, etc. Second, tweets can be further disseminated when recipients repost them through their timelines. This technique, called **retweeting**, refers to the verbatim forwarding of another user's tweet. A third type of messaging is a variant of tweeting and retweeting, called **mentioning**. Mentions include a reference to another Twitter user's username, also called a handle, denoted by the use of the "@" symbol. Mentions can occur anywhere within a tweet, signaling attention or referring to that particular Twitter user.

Twitter Data for the #CommonCore Project

We retrieved the data directly from the Application Programming Interface (API) in Twitter based on tweets associated with #commoncore for a period of six months from September 1, 2013, until March 4, 2014. We defined the study by the hashtag #commoncore (not case sensitive), and captured Twitter profile names as well as the tweets, retweets, and mentions using this hashtag. While #commoncore is certainly not the only hashtag related to Twitter about the Common Core (others include #cc and #ccss), it is the most prevalent tag and served as a starting point for the work. We then conducted a social network analysis of the network using Gephi¹ to identify the overall structure of this large network and then to identify subgroups and key actors that have disproportionate influence, from a social network perspective, over the information and opinions shared across the network. Our data includes messages that are public on Twitter, but not private messages between reciprocal followers.

¹ Gephi (<https://gephi.org>) is a free open source software for interactive visualization, exploration and network analysis of large sizes.

Social Network Analysis

Social network analysis is grounded in the larger idea of social network theory and draws on a set of metrics to examine the pattern of connections, or ties, between individuals that create a larger social network. This network forms a social structure of relationships, which can facilitate or inhibit an individual's access to both physical and intellectual resources such as knowledge, ideas, and opinions. This structure allows for analysis at the individual, pair, small group, and overall network level and as such provides insights into patterns of interactions that are not readily visible. In the #CommonCore Project each node is an individual user (person, group, institution, etc.), and the connection between each node is the tweet, retweet, or mention/reply.

Conducting the social network analysis for the #CommonCore Project

Using the data from Twitter's API, we had to first isolate the content of the tweet itself from its associated metadata (such as a user's follower count, favorites, geolocation, etc.) and then create a file that could be read in Gephi. We then visualized the entire network including all individual actors (approximately 63,000 actors). As we were interested in only those individuals who connected to another tweeter, we narrowed the population to one giant component (a full connected network) comprised of approximately 53,000 connected actors and close to 190,000 tweets.

Determining the factions in the analysis

As we wanted to understand the inner structure and clustering of the interactions within this large connected network, we ran a community detection algorithm to identify and represent factions (a "faction" in this sense is a group with more ties within than across groups, although even those group boundaries are somewhat porous). When we ran the algorithm we found three main factions within the Common Core network.

These factions were based on the Twitter activity of the actors around #commoncore, which resulted in three distinct and overlapping groups. It is important to note, we did not "pre-assign" these factions *a priori* based on attributes of the individuals; rather, we let their interaction activity on Twitter determine the structural group to which they belonged. In other words, the content of the tweets did not influence which faction an actor was assigned to—it was based solely on an actor's ties in the network. It is also important to note that the factions are porous, meaning that the determination of an actor's "belonging" to a group is based on his or her interaction activity (meaning tweets, retweets, and mentions) with others. As such, the boundaries and membership are not hard and fast, but are rather general indicators of faction membership. We then used that data as the starting point to identify actors and then examine the ideas and beliefs of actors within factions (see section on coding of tweets).

Determining who were the key actors in the network

In order to better understand whether or not there were actors that were more active in the social network, we ran measures on each actor in order to find out which individual had relatively more incoming and outgoing ties. Having greater centrality in a network suggests an individual actor has disproportionate influence over the exchanges in that network and, as such, that his or her opinion carries more “weight.” Our results suggested a number of influential actors of different types.

There are three distinct types of actors, which we call *transmitters*, *transceivers*, and *transcenders*. **Transmitters** are individuals who send out a large number of tweets using the hashtag #commoncore. Social network researchers call the activity of transmitters *outdegree*, which is a measure of the number of tweets a transmitter sends. Outdegree is *not* related to the number of followers a transmitter has, but is strictly a measure of how many tweets an individual posts using #commoncore.

Transceivers are a different kind of elite actor, those who have what social network researchers call high *indegree*. In our analyses, indegree is the combination of the number of times a person’s #commoncore messages are retweeted, coupled with the number of times they are mentioned in others’ tweets about #commoncore. Mentions are signifiers of importance in the #commoncore conversation.

We also identified **transcenders**, who have both high outdegree *as well as* high indegree.

Determining the smaller communities of actors

After we identified the factions and key actors in the network, we wanted to peer more deeply into the structure of the network. In order to do that in Gephi we filtered out all other actors to reach 1% of individuals with the greatest outdegree and indegree activity above the average actor in the network. We then filtered to the top .25% of the outdegree and indegree network to reveal the most highly active individuals who were over 2 standard deviations above the mean in their Twitter activity. As the data are publicly available we were then able to specifically identify the core actors and factions and conduct further analysis described in the coding section below.

Coding the Tweets

To take a closer look at the content of the tweets of the top transmitters and transceivers, we drew a random sample of 4,500 tweets (12%) of the tweets from the elite transmitters/transceivers combined and coded them in a variety of ways, including for content, political references, and choice of phrasing. A random sampling approach ensured that the resulting findings were representative of the elite transmitters and transceivers in the network.

Two undergraduate students from the University of Pennsylvania were employed in the summer of 2014 to code the tweets. The coders worked with researchers from the

Consortium for Policy Research in Education (CPRE) to develop the codes and then applied them independently to a random sample of tweets. We then met together to compare coding judgments and iterated this process, both refining the codes and discussing the responses until we gained 80% agreement between the two raters before we proceeded to code the tweets for the study.

Below are the the coding frameworks for the analyses conducted in Act 3 - The Chatter, as well as the samples used to produce the results.

Content of Common Core Tweets		
Evaluates the overall type of content in the tweet. Emphasis is on the content of the tweet only, not based on author or links within tweet.		
1	CC Informational Tweets	Author provides “statements of fact,” directs audience to resource, or provides an account. Since it is intended purpose, verification of fact is not an issue. This code focuses on information regarding specifically to the Common Core and its related aspects.
2	Opinions Supporting the CC	Author provides a point of view or personal commentary that is supportive of the CC. The word “should” may be an indicator (unless tweeter is quoting someone else).
3	Opinions Opposing the CC	Author provides a point of view or personal commentary that is disapproving of the CC. The word “should” may be an indicator (unless tweeter is quoting someone else).
4	Other	General catchall for those tweets that do not fall into any of the previous category. Self-promotion and rhetorical questions not focusing on CC resources or information would fall in this category.
Sample coded: Random sample of 4,500 tweets from members of elite transmitter/transceiver networks.		

Education Topics	Examines topic of tweet beyond the standards, but related to educational topics. (Note, these tweets could contain multiple references, so their total in the results may not exactly match the proportion of the sample analyzed).	
1	Teacher Evaluation	Any reference to teacher evaluation, or merit pay.
2	Testing/ Accountability	Any reference to standardized testing. May be a generic reference or to a particular testing package or regime, including PARCC and Smarter Balance, the two tests coming out for the CCSS—different states may have different names for their tests (e.g., PA is PSSA; TIMSS and PISA is for math and science).
3	Curriculum/ Textbook	Any reference to curriculum in general or specific curriculum or textbooks, or topics covered by the curriculum.
4	Parents	Any reference specifically mentioning parents (e.g., moms, dads, parents) in the tweet. This also includes possessive 2nd person pronouns (e.g., YOUR children). However, this excludes tweets that only mention children/students broadly.
5	Math	Any reference to math, mathematics or any “STEM” references. Some other math words/phrases (use context to determine if it is a math term): learning progression, coherence, rigor, focus, TIMSS, PISA.
6	ELA	References to writing/listening/speech as they pertain to class activities. Some other ELA words/phrases (use context to determine if it is a ELA term): complex text/text complexity, text dependent, tier 2 words, academic vocabulary, informational text, figurative language. Includes references to writing, reading, biography, literacy, informational text.
7	Science	References to science. This may also include any “STEM” references, TIMSS, PISA.
8	Social Studies	References to social studies, history, government, or economics as content areas taught in schools. This excludes historical or government references not related to content areas.
0	None	No educational topic.
Sample coded: Random sample of 4,500 tweets from members of elite transmitter/transceiver networks.		

Political/ Policy Topics	Examines political or policy issues in the tweets. (Note, these tweets could contain multiple references, so their total in the results may not exactly match the proportion of the sample analyzed).	
1	Obama	Tweet references Obama, Barack, Barack Obama, the President, or POTUS.
2	Duncan	Tweet references Arne, Arne Duncan, Duncan, or the secretary of education.
3	Federal Role in Ed	Tweet references the governmental role in education, including terms like Govt, governmental, federal.
4	RTTT	Tweet references the Race to the Top Initiative, may include the acronyms RTT or RTTT.
5	Gates	Tweet references the Gates Foundation, Gates, or Bill Gates.
6	Pearson	Tweet references Pearson or Pearson Publishing.
7	Data Privacy	Tweet references data, data privacy, data mining, or particular data privacy concerns like Inbloom.
Sample coded: Random sample of 4,500 tweets from members of elite transmitter/transceiver networks.		

Political Reference	Examines the topic addressed and/or person addressed in the tweet, as related to government policy (e.g., elections, laws, rulings), political theory, and/or political figures.	
1	Reference to Education Topics	Tweet makes reference to education activity that is directly connected to education but is not political in nature. (i.e., reference to testing is inside this category, but a reference to the politics of testing is not).
2	Reference to Political/Policy Issues	Tweet makes note of political figures and/or government policies that are connected to education. Political theories or ideologies are considered part of this category.
3	None	No references made to government policy or political figures.
Sample coded: Random sample of 4,500 tweets from members of elite transmitter/transceiver networks.		

Level of System	Examines the highest governmental level referenced in education topic or politics/policy-related tweets.	
1	International	References something outside of the United States
2	National	References the national level
3	State	References the state level
4	Local	References district or school levels
5	Unspecified	Level cannot be determined
Sample coded: 930 tweets that were coded as either education topic or politics/policy-related issue.		

Analysis of Policyspeak vs. Politicalspeak

As we examined the data, we noticed that some of the tweets used neutral language and focused on policy aspects of the Common Core (policyspeak), while others were much more emotionally charged (politicalspeak). We wondered if these types of messages were associated with the different factions in the structural networks.

We sought to explore the relationship between the structural faction and this aspect of the language of the tweets by coding the data for policyspeak or politicalspeak. To conduct this analysis, we drew a stratified random sample of tweets from the 930 that referenced education topics or politics/policy issues. We sought to avoid sample bias by stratifying equally by faction. Because this sample was heavily weighted toward tweets from the faction of actors outside of education (yellow), we took the lowest represented group (the blue faction, which contributed 168 of 930 tweets) and drew equivalent random samples for the green and yellow factions. This produced a total sample of 504 tweets. We then coded the 504 tweets according to the following rubric:

Type of Speak	Examines the nature of the tweet in terms of rejection or acceptance of the common core at different levels.	
1	Policy Speak	Tweet seeks acceptance or rejection of the Common Core by focusing on Common Core as policy (e.g., implementation, proposed outcomes, evaluation, precedent). Tweets can exhibit this type of speak through policy jargon, referencing data/precedent, similarity/differences to other policies. Language tends not to be inflammatory or loaded. Lack of “call to action.” Does not necessarily call for outright rejection or acceptance of CC, but focuses on refinement/alternatives.
2	Political Speak	Tweet seeks broader acceptance or rejection of the Common Core (and/or related supporters or opponents) as an entire idea/movement. Tweets can exhibit this type of speak by a “call-to-action,” symbolism, loaded (emotional) language, and/or inflammatory language in addition to making broader statements about the CC and supporters/opponents.
3	Undetermined	Tweet may be unclear in meaning, advertisements, or providing information that does not relate to acceptance or rejection of the CC.
Sample coded: Stratified random sample of 504 tweets; stratified by faction so as not to <i>a priori</i> bias results.		

To conduct statistical analyses of the differences between factions, we used the resulting coded data and conducted separate analyses of variance for each type of speak by faction, with a post hoc test of differences between groups.

INTERVIEWS

The nine interviews in Act 4 – Motivations, were conducted at the end of 2014 and beginning of 2015. The interviews were conducted via telephone with individuals and organizations in the elite transmitter/transceiver networks. We originally reached out to 12 people/groups that were represented in the three factions in the social network. To contact someone, Supovitz followed the user on Twitter in the hopes they would reciprocate so that he could send them a private message inviting an interview. In other cases, he searched for their contact information on the Internet. Three of the sample either never responded to interview requests or declined to be interviewed. Due to audio problems in the recorded interviews of two people, we did not produce podcast for them. We make no claims as to the representativeness of the final sample, but their interviews both enriched the picture of different aspects of the Common Core debate and/or illustrated different themes that had surfaced in other aspects of the data.

Interview Protocol

The interviews were semi-structured, whereby a set sequence of questions was followed while also allowing for latitude to probe and follow up on issues raised by the respondent. The following is the interview protocol:

Hi, my name is Jon Supovitz and I am a researcher at the Consortium for Policy Research in Education at the University of Pennsylvania. I've been studying the Common Core debate on Twitter and notice you are a very prolific voice in that discussion and that's why I reached out to you.

I'd like to interview you as part of a research project that will produce interviews for a website examining the Common Core debate on twitter. May I have your permission to audiorecord the conversation? If there are things that you prefer I not record, I will be happy to shut off the recorder at any time during the conversation, just let me know.

1. So tell me a little about yourself and your background.
2. I see on Twitter that you are involved in a variety of issues, so what got you so interested in the Common Core?
3. Do you recall any particular thing that catalyzed your interest?
4. How would you describe the Common Core to someone who was unfamiliar with the topic?
5. What are some of the other issues you are involved with? Where does Common Core rank in a list of the issues you engage in on Twitter (approximately)?

6. Why do you think the Common Core is such a contentious topic?
7. Has your position on Common Core changed since you engaged in the conversation on Twitter? If so, how?

Now let me focus a bit on social media and Twitter:

8. How frequently are you on Twitter?
9. Do you have any particular strategies that you use to be so central to the Common Core conversation on Twitter (specific hashtags, links)?
10. Do you use any other mediums beside Twitter? Facebook? Blogs, etc? Why did you choose Twitter to talk about the common core? (Focus: Twitter as medium)
11. In what ways do you think Twitter is changing peoples' opinions about the Common Core? How do you know?
12. Do you think Twitter is changing the political conversation in the country?

Thanks for your time. I will reach back out to you to share the product of this interview with you before posting it on our website to give you the opportunity to react.

Interview Analysis

Once the interviews were completed, Supovitz listened to each recording multiple times and selected multiple excerpts that (a) described the individual or group's interest in the Common Core; (b) depicted the motivation for their support/opposition, and; (c) described their use and views of social media and Twitter as an interactive communication platform. These became the rough cuts for the interviews. He then recorded the questions and comments, and these were inter-spliced with the interview segments.

After the interview podcasts were completed, they were put on Dropbox for each respondent to hear, after which Supovitz and the interviewee communicated about and resolved any questions that arose to the respondents' satisfaction.

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