Chapter 13
Genre Emergence in Amateur Flash

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13.1 Genres, Multimedia and the Web

While the core functionality of the World-Wide Web is the exchange of textual communication in the form of formatted text documents over the Internet, this functionality predated the advent of the web, and arguably other features, specifically graphics, were responsible for the attractiveness and rapid adoption of the web and its technologies. Today, one rarely sees a news story on a newspaper web site without embedded graphics of some kind, generally in the form of advertising using Flash multimedia. Multimedia and graphics on the web are notorious for their technological instability, with multiple proprietary and open formats in competition, requiring browser add-ins and software updates for sites to remain usable or even legible. Similarly, the forms of multimedia and graphics are constantly in flux, as old forms are refined and new forms arise on a continuing basis. Advertising makes extensive use of animated formats, especially Flash, although video, sometimes streamed and sometimes delivered in Flash or other formats, is becoming more prevalent. Video weblogs and user-contributed video sites such as YouTube have extended the opportunities available for users to create and manipulate multimedia forms.

For these reasons, a characterization of web genres needs to address multimedia in some form. At the same time, the volatility of multimedia forms draws attention to issues of genre evolution, development, or emergence, which also characterize communication forms on the web more generally, including text. This chapter aims to contribute to understanding multimedia genres on the web. An attempt to comprehensively characterize web-based multimedia genres, however, would presuppose some established or well-defined contextual boundaries, comparable to those employed by Biber [2, 3], with adequate procedures for sampling multimedia types and observing features of interest. While we have some hope that this can eventually be done, our view is that such an attempt at this time would likely be premature.

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Consequently, we instead focus on the mechanisms of genre emergence and the social processes involved. Specifically, we examine the emergence of multimedia genres through processes of social positioning within a particular context, the amateur Flash exchange site www.newgrounds.com (henceforth, Newgrounds). We find that social positioning influences both the conventional forms and meanings of the messages communicated on the site. Furthermore, the social processes involved are similar to those reported for other computer-mediated communication modes, such as Usenet newsgroups [15, 17, 18], Web-based discussion boards [22], Internet Relay Chat [13], Listservs [1], and email [24], among others. Hence, our observations point to a potential source of genre emergence shared across many types of Internet communication.

The emergence of new genres of communication is a recurrent interest in research on digital media. The near-constant state of change in digital media technologies requires users to adapt their communication patterns as the newer technologies are adopted. These may eventually stabilize into socially recognized categories, reflecting expected kinds of content form and purposes of communication. We follow Hymes [14] in identifying stable, culturally recognized categories of communication as genres. Similar definitions are invoked in research on explicitly digital genres. For example, Erickson [11], working to synthesize definitions of genre taken from research on digital media [6, 10, 26–28], defines genres as follows:

> A genre is a patterning of communication created by a combination of the individual, social and technical forces implicit in a recurring communicative situation. A genre structures communication by creating shared expectations about the form and content of the interaction, thus easing the burden of production and interpretation. [11]

Hymes' ethnographic approach foregrounds the notion of the community ("speech community") as the locus of genre conventions; again, similar notions surface in research on digital genres, such as "discourse community" from the field of rhetoric [6, 7, 9, 11], "organization or professional community" [25], and "community of practice" [11]. These notions are sufficiently congruent as to be treated equivalently, though we take Hymes' notion to be more inclusive.

Studies of digital genres have been largely taxonomic in orientation. However, a major reason for referencing the communities in which genres are used is to frame the processes and mechanisms of genre emergence. While the introduction and development of new technologies is important in these processes, particularly in the case of digital genres, it is widely recognized that social processes are critical in shaping the resulting genres. In part, these processes concern whatever messages need to be communicated among the community members; hence, the community, however defined, determines which people are involved in processes of genre emergence and what the likely communicative needs are, as well as what existing genres might be reproduced in the digital environment [6, 11, 26]. At the same time, there may also be social dynamics particular to a community that shape its communicative needs and the genres that may emerge from it.

While recognition of genre emergence places theoretical emphasis on social process, studies of genre emergence tend not to directly address its mechanisms.

Partly this has to do with methodological difficulties: genre emergence is a situated, organic process that unfolds in real-life communication. Such circumstances are difficult to explore experimentally, and it is hard to establish the causal chains implied by the intent to identify mechanisms. Consequently, existing accounts of genre emergence tend to adopt ethnographic and historical approaches. Yet digital media offer opportunities to study genre emergence in a new way. First, digital media tend to provide numerous instances of communication, which are readily stored and archived, and can be examined in detail, post-hoc. Hence, we can create large corpora of exemplars from which to draw inferences about what genres exist, what communicative purposes they serve, and what their typical characteristics are. Empirical methods used for the quantitative analysis of genres (as evidenced by other chapters in this volume) are facilitated by the documents' existence in digital form. More importantly, from the perspective of emergence, is that the systems in which the digital documents reside often carries other traces of social interaction in the form of metadata and user profiles; these can be analyzed using similar methods to reveal patterns of social process that are potentially relevant to genre emergence.

Our approach to the genre analysis of amateur Flash multimedia draws from that of Biber [2, 3], in which a feature matrix for a sample of texts is analyzed using a latent structure model. In this approach, the texts are sampled from traditional corpora such as the London-Lund and Lancaster-Oslo-Bergen corpora, supplemented with additional texts for otherwise un-represented text types, The features are various linguistic variables, lexical classes, syntactic constructions, etc. that are counted in each of the texts, and the latent structure model is a Common Factor Analysis model with non-orthogonal rotation of the factors. Shared variation among the texts is then interpreted in terms of genre (or "register") conventions pertaining to the texts.[1] Our approach has analogs for each of these characteristics: representative samples of Flash animations from a corpus, a feature matrix counting structural features in each animation, a latent structure model for analysis and interpretation in terms of genre. The manifestations of these characteristics differ in certain specific details necessary to the material being studied, but the overall architecture is the same.

To the genre analysis we add a social network analysis based on user profiles. Through social network analysis, we can identify the organic structure among the participants in a community [8, 25], in this case, the amateur Flash multimedia authoring community of Newgrounds. This analysis is expressed in terms of social positions and relations among them, which are characteristically plotted in a reduced social network diagram. Centrality, prestige and power are easily read from such a plot, and the outcomes of other social processes, e.g. competition, can sometimes be read as well.

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[1] Biber uses the notion "text type" as a methodological intermediary in his approach, where the final interpretation is in terms of "register" or "genre" (which he treats as equivalent [2, 3], but cf. [12, 20] for a distinct sense of "register"). See also Chapter 14 by Grieve et al. (this volume) for these terms, as well as Biber et al. [5]; Biber and Kurjian [4]. There is also a distinct use of "text type" elsewhere [19].

In this chapter, we propose that a more compelling account of genre emergence can be constructed by coupling the social network analysis with the genre analysis, and cross-correlating them. In this way, social groups are identified and associated with independently identified emergent genres of Flash content. The associations observed, when taken together with our combined several hundred hours worth of observing communication on the site, help illuminate the processes by which the emergent genres arose. Hence, social network analysis, we argue, can contribute important understandings to the processes of genre emergence in digital media.

The organization of our chapter is as follows. In the next section, we orient the reader to our research site, Newgrounds, highlighting characteristics salient to its users that play a role in genre emergence on the site. We then outline our data and analytical methods, of which there are three major components: identifying social relations on Newgrounds, identifying candidate emergent genres, and longitudinally correlating the relationship between genre and social relations. We then discuss the results, and conclude with wider implications for the study of genres on the web and genre emergence more generally.

13.2 Flash and Newgrounds in Amateur Multimedia

Multimedia on the Internet takes many forms, but by any measure Flash is a very important one. Unlike alternative formats such as SVG, Flash enjoys broad support, with plugins or native support in the majority of web browsers. Flash is also widely deployed in web-based advertising, and a some types of websites (e.g. many official fan websites for celebrities, models and popular music artists) make extensive use of Flash for content that is otherwise easily delivered as HTML.

Flash has a long history of use in amateur Internet animations. While originally developed as a program for handwriting recognition, its authors quickly re-purposed its vector-based graphics rendering engine for delivering animated images on the web, once it became clear that it could provide resolution and bandwidth advantages over rasterized video. As a nominally open yet proprietary format, Flash was primarily developed for authoring tools marketed by Macromedia (now part of Adobe), although third-party authoring tools, such as FlashMaker and the open-source Ming library also exist. It has been adopted as a development platform by many higher-education programs in animation and multimedia. Numerous websites specialize in collecting and archiving completed animations, as well as works in progress, artwork, ActionScript programming, and other source material needed to make Flash animations. For this set of reasons, Flash has a broad and international following among amateur animators.

Newgrounds has a central position in the Internet ecology of Flash. Originally a personal website of Internet game author Tom Fulp, Newgrounds has evolved into a major hosting service for amateur Flash. In April 2000, under Fulp's entrepreneurship, Newgrounds added a "flash portal" where users could upload their own creations to be hosted on the site. Pre-figuring many of the social networking and discussion features of YouTube and other media sites, the portal provided a

rating system for judging submissions, a mechanism for communicating reviews and critiques to authors, discussion fora, and author profiles with social networking features ("favorite flash", and "favorite authors"). Since the Flash portal opened, it has attracted over one million distinct users and over 300,000 flash animations. Most users are teenage or young adult males living in English-speaking countries, but Flash authors from a wide range of international backgrounds exhibit their work on the site.

Informal observation suggests that Newgrounds is a site of genre emergence. Several recognized forms of Flash originated on Newgrounds and are still mainly practiced there. One such type is a narrative constructed around characters from video games, in particular, older console games such as the Super Mario Brothers, Sonic the Hedgehog, Megaman, Final Fantasy, The Legend of Zelda and others. Stick figure animations are also common, and like the video game animations, they tend to be focused on elaborately choreographed fight scenes. Other types are more subtle to identify.

One such example is "animutation" a form based largely on animation of bitmaps synchronized to music (especially Japanese popular music), thematically exploring paradoxes around masculine "geek" identity [16]. Similarly, there are "clock movies", featuring avatars made with inanimate objects that have clocks or other objects for faces). Both animutations and clock movies make heavy use of intertextual references, especially to other animations on Newgrounds; one needs quite a bit of background knowledge about the authors and their animations to fully appreciate them.

A number of popular Internet animations originated on Newgrounds, and these often have a canonical status, being widely emulated or parodied. Curators on the site often arrange them into "collections", semi-official listings of related animations. Examples are "All Your Base are Belong to Us", a fast-paced montage of still frames which circulated during an Internet craze of the same name, and the "Numa Numa Dance", in which a 19-year old Gary Brolsma from New Jersey lip-syncs to a Romanian pop song. These different types of animations are potential sites of genre formation for amateur multimedia.

The cultivation of distinctively Newgrounds-based styles such as these, and the attendant competition for viewers' attention on the site, also leads to the expression of specific kinds of messages within the movies themselves. Typically, these involve an author's social alignment with or against some other author or authors. One type of message we see quite frequently is one we call "ownage", in which an animator appropriates another animator's character to show it in a compromised (often mutilated) condition. Often times, this is accompanied by text declaring that the author "owns" (or "pwns"), in video gaming parlance, the other animator. The intent of this message is to assert a superior position over another (usually popular) animator.

Hence, Newgrounds is a site central to the distribution, critique and support of amateur Flash animation. Flash hosted on the site exhibits formal structures that are potentially distinctive to Newgrounds Flash content, and its content involves at least some distinctive kinds of messages, expressing social positioning of animators on

the site. It is thus a site of potential genre emergence. We turn now to the methods that we use to investigate the emergence of Flash genres on Newgrounds.

13.3 Method

Our method has two main parts: a social network analysis of user profiles from Newgrounds, and an analysis of selected movies for genre features and cultural references. The primary methods in both analyses are quantitative, relying on Principal Components Analysis and hierarchical clustering to identify relevant groupings. For the social network analysis, we obtained a sample of user profiles by randomly sampling 10,000 initial profiles and iteratively crawling social network links from those. These data were then arranged in a user-by-user sociomatrix, to which we applied a minimum threshold, ultimately keeping actors with at least eight "favorite author" nominations. This sociomatrix was then reduced to a set of structurally equivalent social positions using Principal Components Analysis followed by Hierarchical Cluster Analysis, which we then interpreted by inspecting the cluster members and viewing the corresponding profiles and movies. We then aggregated the sociomatrix according to the clusters and plotted the reduced social network diagram to get a sense of the structural relations among the different social positions.

For the genre analysis, we constructed a stratified random sample of movies, sampling movies from each of the social positions at equal probability levels. In this way, we ensured that movies produced by each group of authors would be represented comparably. We then viewed these movies and classified them according to a set of variables hypothesized to be related to the potential genres of Flash movies. In addition, we coded the same random sample for cultural reference variables. Both sets of variables were constructed by the research team using an iterative (hermeneutic) grounded theory approach [23]. Genre features and cultural references were arranged into document-by-feature and document-by-keyword matrices, which we again analyzed by Principal Components and Hierarchical Cluster Analysis. These three analyses were then cross-correlated and compared with the dates that the movies were first posted, so that an interpretation of genre emergence over time could be developed.

13.3.1 Sampling

The sample data were collected from two types of pages on the Newgrounds site: movie description pages[2] and user profile pages.[3] Both types of pages are created by the site's users and are open to the public web. Movie description pages contain several important pieces of information. An "author" field lists names and links

[2] For example http://newgrounds.com/portal/view.php?id=206373

[3] For example http://newgrounds.com/gold/profile/template.php3?id=318335

to the profiles of as many as five authors, along with a submission date and time. Beneath the author information, a six-level rating scale (0–5) permits site visitors to rate the submission; these ratings are aggregated to provide an indication of a submission's overall popularity. If the aggregate rating (a weighted average) falls below 1, the submission is removed from the site, or "blammed". Several more pieces of information are specific to the submission itself, including a link to the actual Flash file, a space for author comments, the most recent review, and a link where registered users provide their own review.

Users' profile pages provide some useful personal and social information, including an image identifying the user (possibly an avatar image), age, gender, location, occupation, and a personal message, some of which are optional. In addition, user profiles provide four menus providing links to Flash files that they have authored, audio files they have authored, their favorite Flash artists and their favorite Flash content hosted on the site. User activity on the site is reported in aggregate in terms of "levels" and "ranks", based on the amount of reviewing, they have done and their voting patterns. Each user profile also has an integer serial number, making random sampling straightforward.

Using a seed of 10,000 random integers between 1 and 856,613 (the user count as of November 11, 2005), the corresponding user profiles were collected. Of the initial 10,000 pages, 1,115 contained menus with the necessary social network information. This information was extracted using DOM parsing and each link found was recorded in a database table with the following four columns:

(i) the crawling iteration number
(ii) the profile number containing the link
(iii) the destination profile or movie number linked to, and
(iv) the type of link (i.e. which of the four drop-down menus)

In each iteration, new profile pages (identified through the "Favorite Flash Authors" from the previous iteration) were collected and parsed, resulting in a "snowball" sample. The process was repeated until no more new profiles were found. When the favorite author sampling no longer returned results, the "Favorite Flash Content" relationships were used to find Flash movie description pages. Those movie pages were then visited and the authors from their collaborator lists were extracted for use as the seeds of subsequent snowball samples. In all, over 38 sampling iterations, 17,479 pages were visited for this study. Out of the more than 900,000 profile pages available at the time of this sample, 8,314 were visited and 158,723 unique author-author relationships were identified. This suggests a fairly densely interlinked set of core Newgrounds users.

13.3.2 Identifying Potential Emergent Genres

The genre feature analysis was conducted in two phases. In the first phase, members of the research team independently viewed a common sample of 50 Flash files that

had been randomly selected from the corpus of Flash authored by any of the users in our sample. Each team member made notes which were shared and discussed in joint meetings when the Flash was viewed again. From the discussion, the following 67 potential genre features were identified for further examination.[4] These genre features fall into six major structural categories:

1. Production elements:
   a. Preloader: Newgrounds, Flashportal, Games of Gondor, Armor Games, or other branded preloader
   b. Credits: opening, closing, during play
2. Authorship: single author, animation + sound collaboration, other collaborations
3. Narrative:
   a. Main point: action, fight, dance, drama, collage, participatory narrative, game
   b. Characters: video game, anime, celebrities, avatars, other characters
   c. Narrative advancement: by scenes, camera effects, special effects
   d. Pacing: slow, dense
4. Technique:
   a. Graphic composition: vector animations, bitmaps, 3D animations, video, stop-action, slideshow
   b. Artistic technique: carefully drawn, rapidly drawn,
   c. Animation technique: vector-based transformations, frame-by-frame
   d. Backgrounds: fill, gradient, bitmap pictures
   e. Camera effects: zoom, pan, tilt/rotate
   f. Characters: stick figures, clocks, locks, glocks, stars, other abstract
5. Audio:
   a. Music: J-pop, movie, rock/metal, pop, classical, rap/hip-hop/R&B, video game music, other musical genres
   b. Voices: computerized voices (Speakonia), voice acting, subtitles
   c. Misc. audio: sound effects, subtitles, distortion
6. Interactivity: buttons, scene menus, keyboard/mouse actions, play/pause controls, subtitles on/off.

The original sample of 50 files was recoded according to the 67 features collectively by the entire research team, with any variant codings discussed in subsequent meetings until there was full agreement on the coding definitions and the codes for the first 50 files. An additional 850 files were then identified as a second random sample. These were split into three groups and analyzed by the individual members of the research team, resulting in a combined set of 900 Flash files. Of these,

[4] The resemblance to Biber [2] in the number of genre features is entirely accidental.

29 had been blammed, deleted or were otherwise unavailable for analysis, leaving 871 Flash files in our sample. Each of the 67 genre features was coded as a binary attribute, present or absent. Some of the features coded are in entailment relations, e.g. use of any of the camera techniques (zoom, pan, rotate/tilt) implies that camera effects are used for narrative advancement, and single authorship implies that a submission is not a collaboration. Other superficially similar features may not be in an entailment relation, e.g. a submission may use bitmap backgrounds without needing to use a bitmap composition technique such as editing in Photoshop.

Some of the features selected are specific to Newgrounds Flash, and hence require further explanation. For example, many submissions use abstract characters of different sorts, by which we mean participants in the narrative whose features (arms, legs, faces, etc.) are abstracted in some way. The most obvious of these is the stick figure, but Newgrounds exhibits many other types. One abstract character type is found in the "Madness" series, where a character's head and torso are simple geometric shapes, the face is simply a crossed pair of lines (representing nose and eyes), and hands and feet are not attached to the character's body by visible limbs. Another salient type of abstract character is the "Clock" character: canonically a fruit with a clock face in place of facial features, animated to give the impression of facial expressions. Clock characters typically function as avatars: the animators who post them tend to use nicknames with "clock" (Orange Clock, Pineapple Clock, Raspberry Clock, etc.) and typically identify with the "Clockcrew", an informal association of animators. Other authors using abstract characters follow the clock style, replacing the eyes, nose and mouth with other objects such as a keyhole (the "Lock Legion") or pistol (the "Glock Group"). These latter types of abstract characters also tend to represent avatars of their animators.

Another important set of features concerns the means by which the submissions are composed. While all of the files on Newgrounds are delivered as Flash (.swf) files, a variety of tools are used to compose them. Most are composed using Flash (and Flash tutorials are a common type of submission), although it is common to use bitmap graphics, or a combination of vector graphics and bitmaps. A small proportion of Newgrounds submissions are composed as slideshows (timed sequences of still shots), videos (imported from another application) or stop-action movies (usually with clay animation, legos or action figures) (Fig. 13.1).

13.3.3 Cultural References and Message Content

Genres are only partially defined according to their formal features. Another important component is in the purpose or communicative intent of the communicative event. In order to identify categories of message content, cultural references are defined as any normative social or cultural expression invoked in an animation, independent of any stylistic or technical aspects of that expression. Generally, cultural references are taken here to be socially semantic or ideational expressions (people,

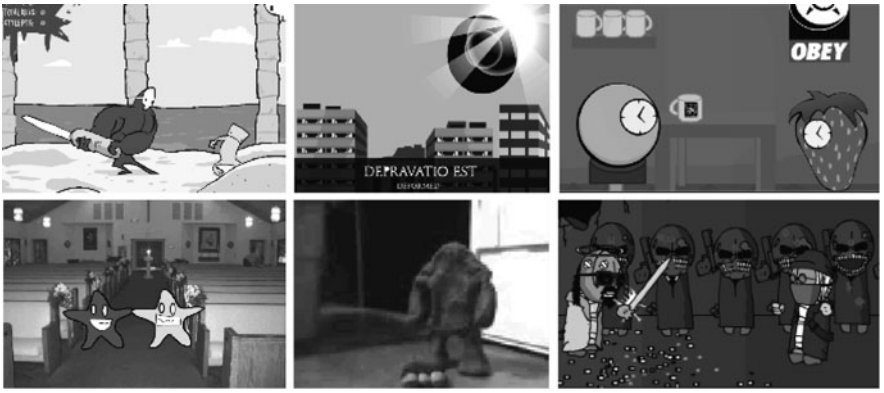

Fig. 13.1 1 A set of frames from various Flash files on Newgrounds. *Top row*: characters in a game by Tom Fulp and Dan Paladin, an animation employing sophisticated Flash vector animation techniques (gradients, blur, panning, etc.) and a Clockcrew movie with clock avatars. *Bottom row*: Star Syndicate avatars on a bitmap background, a claymation by Knox, and a scene from a movie in the Madness series by Krinkels

things, and ideas), in contrast to the forms and techniques used as genre features above. We did not attempt to interpret personal, non-social meanings of individual authors.

Cultural reference features were identified inductively from the animations in much the same way as were the 67 genre features. Fifty movies from the sample of 890 were viewed by the entire research team, and all cultural references that any of the team members could identify were given labels for use in coding the rest of the sample. Unlike with the genre features, the remaining movies were coded by a single member of the research team (the second author), who accumulated and employed a controlled vocabulary of 3,016 distinct cultural references as he worked. Although the coder is not an author or reviewer on Newgrounds, he has a similar demographic background to a typical older Newgounds author (28 year-old US male).[5] Signs and symbols that were unfamiliar, and which may have been cultural references, were searched-for on the Newgrounds website and on the Web as a whole until the sign had been adequately understood. At the end, a codebook (available upon request) containing code-to-meaning correspondences was manually constructed from the complete vocabulary of codes. Intracoder reliability was confirmed informally by revisiting a subset of 20 of the movies 3 months later and, using the codebook, confirming that the same codes still seemed appropriate.

As with the six categories of genre features, one can identify categories of cultural reference features. The following six categories summarize cultural reference codes that were each applied to more than 10 movies:

[5] The age and gender distributions of Newgrounds users are known from forthcoming studies not reported here.

1. Sex and violence (most common codes; each line is from most to least frequent)
   - pistol, fire, machinegun, sword, knife, katana, ninja, decapitation, xeyes, money, cigarette, zombie, redeyes, robot, pirate, shotgun, dismemberment, aliens, bomb, nuclear, marijuana, suicide, skull, beer, axe, rifle
   - sex (depicted/suggested), penis, boobs, trickytheclown, masturbation, prostitute
   - gay (as insult), homosexuality (depicted/suggested), fag (as insult)
2. Newgrounds author groups
   - SBC, speakonia, clockcrew, B, orangeClock, pineappleClock, anticlockclock, raspberryclock, king, pwn, bananaclock, truffleclock, pepsiclock
   - starsyndicate, dailytoon, tehedn, paly
   - locks
   - sticks
3. Mass media and video games
   - matrix, starwars, lotr, startrek
   - tmnt, simpsons, powerrangers, pokemon, dbz, transformers,
   - game, mario, finalfantasy, legendofzelda, sonic, nintendo, megaman, xbox
   - tv, tvstatic
   - mswindows, mcdonalds
4. Celebrities and famous people (including prominent Newgrounds personalities)
   - gwbush, michaeljackson, hitler, binladen, americanflag, nazi
   - devil, jesus, christmas, god, crucifix, santaclause, christianity
   - legendaryfrog, wadefulp, tomorrowsnobody, foamy, superflashbros, piconjo, knox, perfectkirby, tomfulp
5. Nature
   - earth, moon, outspace, starrynight, sun, spaceship, rain, flowers
6. Slang
   - omg, lol, :(, wtf, <3, :), blam, rotfl

These categories go some distance towards defining the communicative intent of these Flash movies. The first category describes types of weapons (pistol, fire, machine guns), characters (ninjas, zombies, robots), and actions (decapitation, suicide, dismemberment) that often appear in violent sequences of the movies, which are extremely common. Also common are themes of sexual function, sexual violence, and homophobia as well as the use of gateway drugs (cigarettes, marijuana, beer). A second category includes references to the "crews" mentioned earlier (Clock Crew, Star Syndicate, Lock Legion). Much like street gangs in real life, each crew has its own intricate system of signs and authority figures, which its members use to distinguish themselves and to mark their (in this case, artistic) territory. For example, the Clock Crew's founder, Strawberry Clock, often declares himself "King

of the Portal", which is a designation given to authors of high-ranking movies by the site's proprietors. Category three describes mass media influences invoked in the movies, including large science fiction and action films (Matrix, Star Wars, Lord of the Rings), television cartoons and children's shows (Simpsons, Teenage Mutant Ninja Turtles, Pokemon), and popular console video games (Mario, Final Fantasy, Legend of Zelda). In the fourth category, several types of famous people emerge, namely politicians and pop culture figures who are often ridiculed in the animations (GW Bush, Michael Jackson, Bin Laden, Hitler), figures associated with Christianity (devil, Jesus, God), and popular authors on Newgrounds (Legendary Frog, Tomorrow's Nobody, Super Flash Brothers). The fifth category shows how the natural world is typically depicted in the movies. Science fiction and action movies often have space, Earth, or the moon as their background. Movies set outside on Earth often include the sun, rain, and flowers. Finally, a number of popular Internet slang terms have found their way into Newgrounds movies, having their usual meanings, including omg, lol, :), :(, wtf, <3 (a heart), and rotfl. The local term "blam" also appears often, because users fear having their movies rejected, and use the word to threaten others with public rejection. The visual nature of all six types of cultural references makes their communicative intents particularly salient in the animations, perhaps even more salient than if they were to appear in textual modes of group computer-mediated communication.

13.4 Results

Our results are presented in four parts. In Section 13.4.1, we describe the social network analysis followed by the genre analysis in Section 13.4.2, and the analysis of cultural references in Section 13.4.3. Finally, in Section 13.4.4, we describe the mapping across these three analyses, using a log-linear modeling framework, to answer our questions about the relation of genre emergence to social structure and process.

13.4.1 Network Analysis

Our network analysis was conducted in two steps. We first constructed a sociomatrix from the favorite flash author information in the user profiles, considering only those authors identified eight or more times as "favorite". This was reduced to a set of seven social positions, using Principal Components Analysis and Hierarchical Cluster Analysis (using Euclidean distance and Ward's clustering method). This method identifies socially equivalent actors, in terms of their ties to other actors [8, 25]. A dendrogram for this cluster analysis is given in Fig. 13.2.

The cut taken of the dendrogram, leaving seven clusters was arbitrary, and was intended to break apart some of the larger groups in case interesting structure within them might be missed at a higher level of cut. Inspection of the principal components plots for these clusters showed that each was separated along a distinct principal

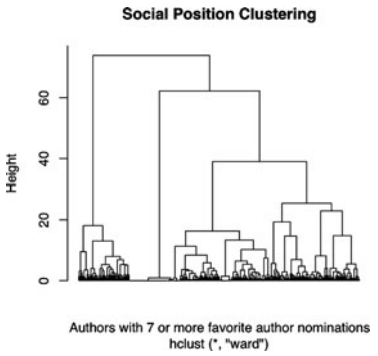

Fig. 13.2 Cluster dendrogram of social positions by favorite author nominations

component dimension, hence, the separation of these clusters is also justified on empirical grounds.

Moreover, membership in the different clusters is readily interpretable, at least from the perspective of the experienced user of Newgrounds. One cluster includes both Newgrounds entrepreneur Tom Fulp and his principal artistic collaborator, Dan Paladin. This group of authors represents the "mainstream" of Newgrounds Flash, and we label it "Tom Fulp et al.", on account of his naturally central position on the site. A second cluster, resolved as distinct from the first cluster on dimension 3, is a group of highly popular authors including Legendary Frog and the Super Flash Brothers (called here "High Production"). These authors concentrate on creating movies with high production values, generally based around video game themes (though not exclusively). Three more clusters consist of creators of avatar movies, principally older and newer members of the Clock Crew ("Older Clocks" and "Newer Clocks", respectively) and members of the Star Syndicate, whose principal product has a series of daily Flash collaborations called "daily toons". The last two clusters are a group of authors making movies based on video game themes ("VGDC", for "Video Game Digital Character"), and a residual group of authors with no clearly characterizable style ("Other").

We re-counted the favorite author links as ties among the seven social positions identified, and visualized them in a reduced sociogram, presented in Fig. 13.2, from which it is clear that Fulp's group and the Older Clocks are the most central participants on Newgrounds. These two groups simultaneously lend each other social capital and receive ties from members of many of the other groups, especially Other, which represents the undifferentiated residual group. Four groups show significant self-ties, meaning that their members provide support to other members of the same group. Among these only Fulp's group is central; the other three show no significant ties of support from other groups. Hence, the popularity of these three groups, and the success of their Flash content on Newgrounds, depends largely on their internal social cohesion. The High Production group differs from the others in its peripherality and lack of internal cohesion.

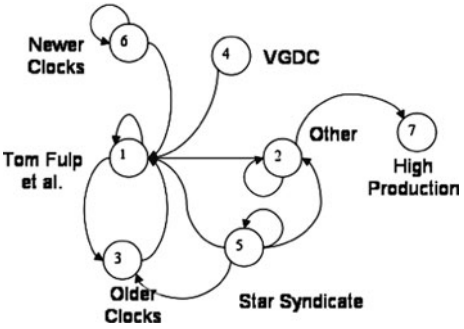

Fig. 13.3 Reduced sociogram indicating ties among the seven social positions of Flash authors according to favorite Flash author nominations

The sociogram in Fig. 13.3 reflects a state of competition among the different groups, which we noticed in observing movie reviews and references made in the movies themselves. In particular, the Star Syndicate and the Newer Clocks, which do not have a tie in Fig. 13.3, appear to be in fairly direct competition, with members voting unfavorably on the animations produced by the other group, and ownage messages being expressed, especially in the animations of the Star Syndicate. Both reviews (positive and negative) and favorite author ties represent attempts by site members to operate on their own social positions. Positive reviews and "favorite" nominations strengthen one's alliance with others, while negative reviews diminish the popularity of competitors; both are strategies for increasing the popularity of one's own work.

13.4.2 Genre Features

The seven social positions of favorite Flash authors were used to construct a stratified random sample having approximately equal numbers of selections from each of the seven positions. Movies from each of the author groups were pooled, and randomly selected within each group. The codings for the 67 genre features were arranged into an 871 by 67 element matrix, with the genre features as columns, the individual Flash files as rows, and 1 or 0 values in each cell, indicating presence or absence of a feature for a given movie. The matrix was column-wise transformed into z-scores, and a Principal Components Analysis was conducted on the result. A scree plot of the variances of the Principal Components indicates between five and six dimensions of shared variation among the genre features. We adopted a conservative solution having five dimensions. Hierarchical cluster analysis (using Euclidean distance and Ward's method) was performed on the component scores for the Flash files, yielding the cluster dendrogram in Fig. 13.4. These clusters represent features with shared variation, i.e. features that tend to correlate in some set of movies. A number of different cluster cuts were tried on this analysis; for the subsequent analyses, a cut of 5 clusters was found to be most suitable; larger numbers of clusters caused the data to be too sparsely distributed.

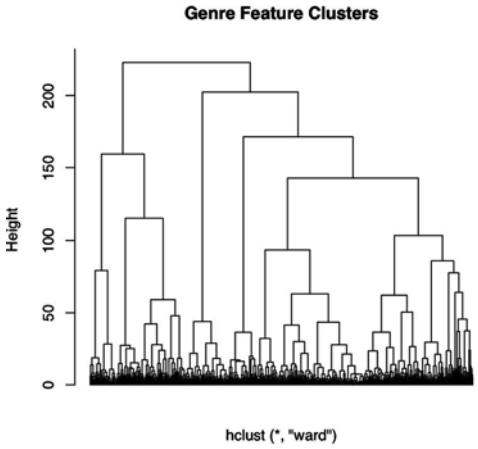

Fig. 13.4 Cluster dendrogram for genre features

For interpretation of the clusters, principal components scores and loadings of the 67 features for the first four PCs are plotted in Figs. 13.5 (PCs 1 and 2) and 13.6 (PCs 3 and 4). The features loading highest on PC 1 (in Fig. 13.5, left frame) are mass-collaborative authorship (A-mass), raster composition techniques (raster-comp), bitmap images, rapid drawing techniques, clock and star avatars (and avatars generally), speakonia voices, and flashing backgrounds. Hence, PC 1 appears to characterize avatar-movies, especially from members of the Clock Crew and the Star Syndicate. The low end of PC 1 appears to be characterized primarily by single authorship (A-sing). Features loading highest on PC 2 are video composition, stop-action animation and composition, and frame-by-frame animation, while those loading lowest are vector composition and animation, use of background color fills and gradients, careful drawing style and camera zooming. PC 2, therefore, appears to differentiate animations according to different animation techniques.

In the scores in Fig. 13.5 (right panel), three clusters stretch in the positive direction on PC 1: Clusters 1, 3 and 5; of these, proportionately more points from Cluster 3 tend in this direction. Otherwise, Clusters 1, 2 and 5 overlap near the origin but are shifted slightly to the negative direction for both PCs, while Clusters 3 and 4 are spread over a diagonal band from the upper left to the lower right. Cluster 3 is highest on PC 1 and neutral on PC 2, while Cluster 4 is highest on PC 2 and neutral on PC 1.

The feature loading the highest on PC 3 is the dramatic story type, along with a number of features also loaded negatively on PC 4: clock and lock avatars, speakonia voices, Newgrounds preloader, and single authorship. Those loading negatively on PC 3 are sound effects and buttons, along with two features also loaded negatively on PC 4: games, and keyboard/mouse interactivity. Features loaded positively on PC 4 are abstract characters, stop-action and frame-by-frame animation, and other preloaders. Hence, PC 3 appears to contrast dramatic avatar movies with interactive

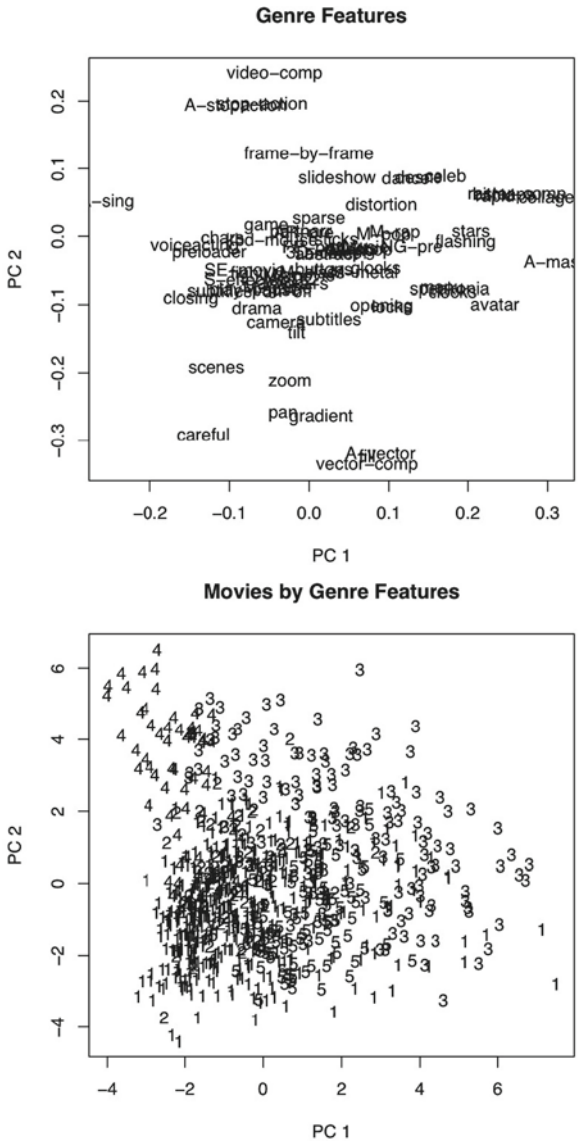

Fig. 13.5 Principal components scores and loadings for genre features on 871 Flash files, PC 1 and 2

games, and PC 4 distinguishes avatar movies from movies with abstract characters and frame-by-frame techniques (e.g. clay animation movies by artist Knox).

Among the scores for PCs 3 and 4, the most striking pattern is the separation of Clusters 2 and 5 from the remaining clusters in the negative direction on PC4, with Cluster 5 in the positive direction of PC 3, and Cluster 2 in the negative direction. Hence it appears that Cluster 3 is characterized by mass authorship and

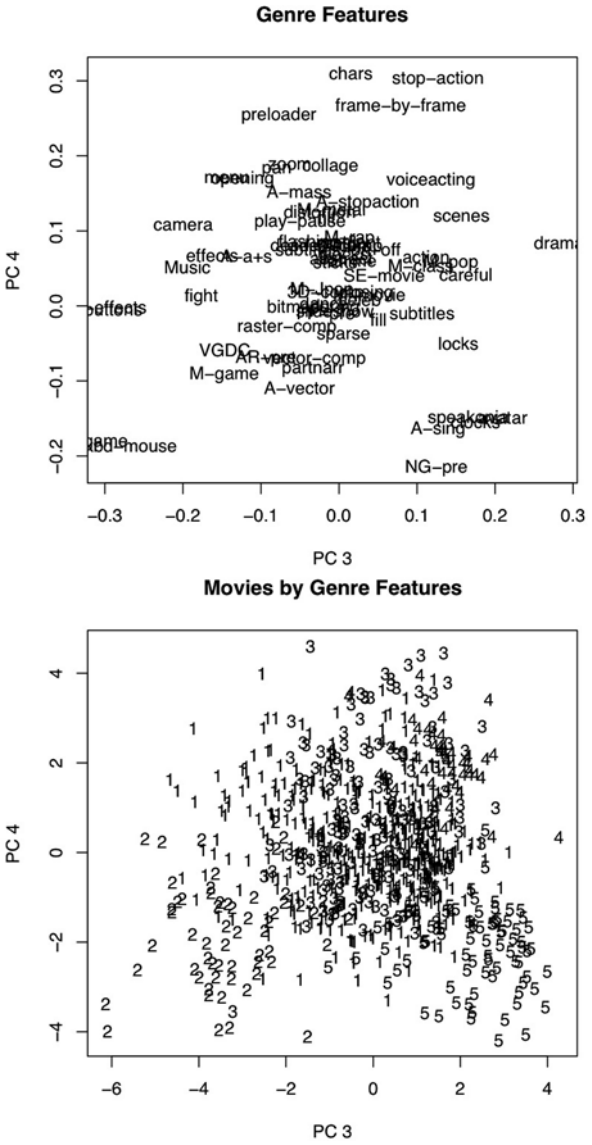

Fig. 13.6 Principal components loadings and scores for genre features of 871 Flash files, PC 3 and 4

avatar features, Cluster 5 is characterized by single authorship and avatar features, while Cluster 2 is characterized by features of interactive games. Finally, Cluster 4 is characterized by non-vector composition types (video, frame-by-frame, stop-action) whereas Cluster 1 is characterized by relatively neutral values of all these features.

13.4.3 Cultural References

Cultural references were treated similarly to the genre features, with the exception that the coding generated many more cultural references than genre features. In our first pass, we constructed an 871 by 3,016 matrix, which was too sparse for successful analysis. Consequently, we needed to select a more restricted set of cultural references. Restricting membership to cultural references occurring 10 times or more resulted in a smaller set of 149 cultural references; the resulting 871 by 149 matrix was found to be suitable for our analysis. Principal components analysis and hierarchical clustering resulted in the dendrogram in Fig. 13.7. Again a cut of 5 clusters was investigated in the subsequent analysis.

The cultural references loading highest on PC 1 (Fig. 13.8) are the yellow "frowny face" icon, the spelling "teh" for "the", "lol" (an acronym for "laugh out loud"), money, "pwn" (for "own", or dominate), head, gay, and "omg" (for "oh my god"). Those loaded negatively on PC 1 are games, the Newgrounds Flash artist *Tomorrow's Nobody*, Flash tutorials, and clay animation. Therefore, PC 1 contrasts abstract symbolic references with references to specific authors and their work. On PC 2, cultural references are only pulled out in the positive direction, and all of these represent specific Newgrounds Flash characters from Clock animations and the letter B. The letter B is important in Clock animations because their inspirational leader, who originally went by the name "Strawberry Clock" notoriously posted a Flash file containing only a still letter "B", and managed to get people to vote for it so it could pass judgment and not be blammed from the site.

Among the scores on the first two principal components, Cluster 2 is clearly separated out on PC 1, and Cluster 4 is separated out on PC 2. Hence Cluster 4 appears to be associated with Clockcrew animations, while Cluster 2 invokes strong

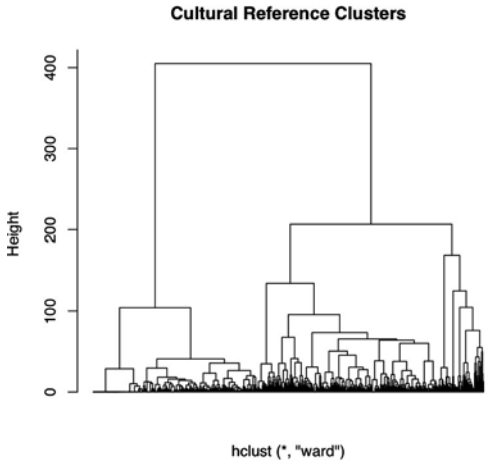

Fig. 13.7 Cluster dendrogram of 871 Flash files based on principal component scores of cultural references found in 10 or more movies

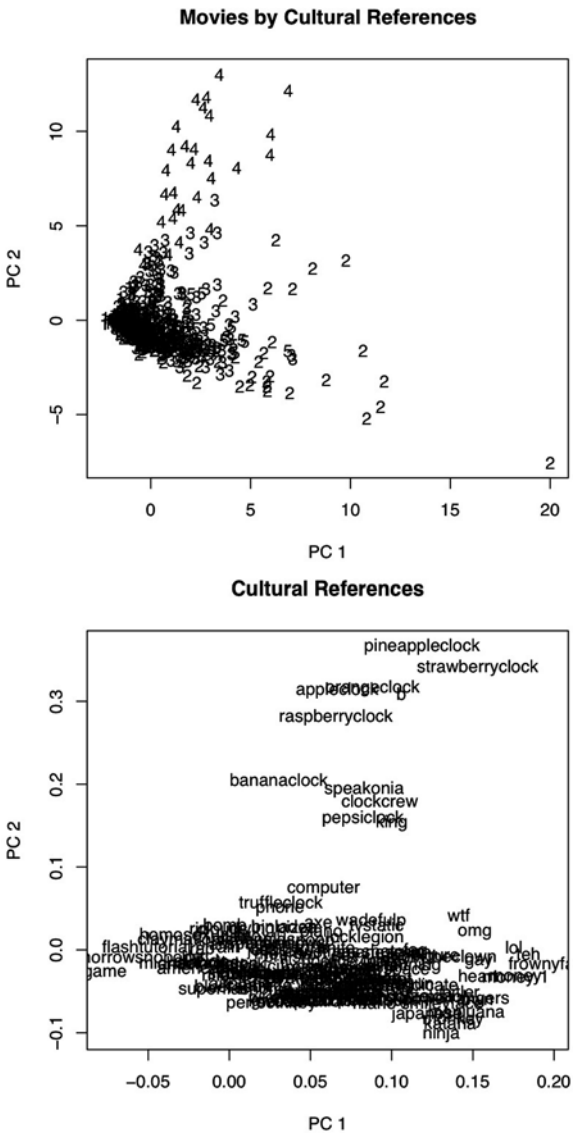

Fig. 13.8 Principal components loadings and scores for cultural references in 871 Flash files, first two principal components

evaluations commonly found in Internet-based youth culture. The remaining clusters are concentrated on the origin in these two principal components.

The cultural reference loadings on PC 3 and 4 (Fig. 13.9) show a more complicated, three-spoke pattern, where the spokes are oriented negatively on PC 3 and neutrally on PC 4, positively on both PC3 and PC 4, and positively on PC 3 but negatively on PC 4. The first spoke concerns themes found in Star Syndicate

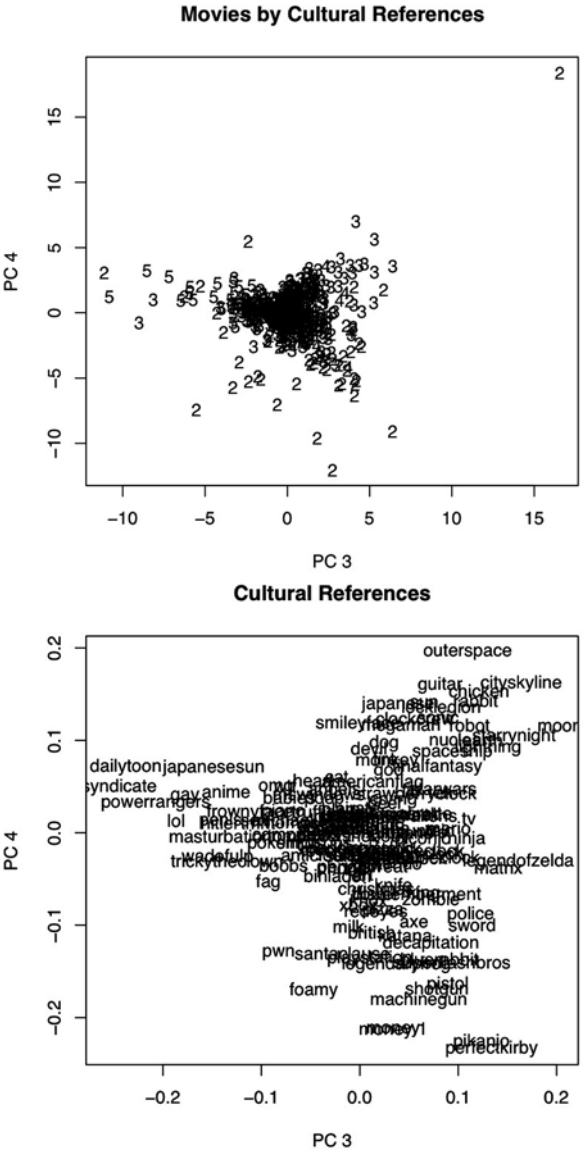

Fig. 13.9 Principal components loadings and scores for cultural references in 871 Flash files, PC 3 and 4

animations. The second involves references to outer space, spaceships, robots, the moon, as well as chickens, rabbits and Clockcrew and Lock Legion characters.

The third spoke involves references to Newgrounds Flash authors Pikanjo, Perfect Kirby, Legendary Frog and Super Flash Brothers, as well as various types of guns. This spoke appears to reference a common plotline in movies by these authors,

where a character raids a military compound and kills everyone he/she encounters using a variety of weapons. These authors' animations also feature frequent references to stick-figure movies (which tend to have similar plotlines) as well as to the Matrix movie series. The same plot line figures in narratives, in which the fight in a military setting provides a context in which two or more rival authors "duke it out". The author composing the animation generally wins, hence, the message of these animations is similar to ownage.

Among the scores, these spokes separate Cluster 5, Cluster 3 and Cluster 2 respectively, with the exception that Cluster 2 has members overlapping with Cluster 5 as well as the one member extremely positively loaded on both PC 3 and PC 4. This outlying member is also positively loaded on PC 1, so it probably represents an animation densely packed with cultural references. In fact, all of Cluster 2 loads highly on PC 1, which accounts for its separation from the other clusters, which is otherwise not apparent on PC 3 and 4.

Like the genre features, the cultural references clearly differentiate different clusters of movies. Clockcrew, Star Syndicate and High Production Flash authors are strongly represented in these references, and hence interaction of Newgrounds Flash authors on Newgrounds provides a major resource for subject matter in Newgrounds Flash. In other words, members of the community make reference to their own and others' experience on the site in their movies, but the movies fall into distinct types, with regard to whose experiences they index; these groups partly reflect the articulation of social groups of Flash authors on Newgrounds.

13.4.4 Genre, Emergence and Social Network

So far we have evidence of three different patterns among Flash authors on Newgrounds. First, from the favorite author network of Newgrounds authors, we can identify clear structural positions, which appear to differentiate users both by self-identification and in regard to preferred types of content. Second, in the analysis of genre features, there appear to be distinct forms of animation produced by Newgrounds Flash authors. Some of these are not in evidence elsewhere, as they are specialized to the social context on Newgrounds (e.g. features of the avatar animation type). Hence, this and possibly other types may represent emerging genres of Flash animation. Finally, a parallel trend can be observed in the cultural references, in which distinct groups of references to avatars were observed.

In order to fully address the question of genre emergence, we need to ask if these three patterns are related to one another, and whether we can observe change over time among them. To address this, we classified each of the 871 Flash files in our sample according to the social position it was sampled from, and the genre feature and cultural reference clusters identified from them. In addition, we computed a time period based on the Julian date that each animation was originally posted. Six time periods were recognized, based on these dates, with each one being a full year. We then aggregated across each of these variables, counting the number of movies in each combination of categories. The resulting table comprised 270 cells, with

a maximum of 16 in the largest cell. This table was submitted to log-linear (Poisson regression) modeling, to identify which combinations of independent variables were more prevalent, and which changed significantly over time. All independent variables were modeled as categorical variables, except for time, which was treated as continuous.

Log-linear modeling was conducted first from a full main-effects only model, and subsequently excluding non-significant main effects. Main effects for the category variables in this model represent the overall cluster sizes, in terms of their representation in numbers of Flash animations. They are not in themselves interesting to interpret, but they need to be in the model so that the category–category combinations that are tested take into account the relative sizes of the different categories. A main effect for time, as a continuous variable, represents overall growth of submissions on Newgrounds over time. Again, from the perspective of emergent genre, this would not be too interesting, but it is needed to compare against the different category–category combinations over time, so that genre emergence can be properly tracked.

Once a satisfactory main effects model was identified, interactions were systematically tested, to identify category combinations that were more or less common than the relative sizes of the individual categories alone would predict. When significant interactions were found, efforts were made to simplify the categories, using the cluster dendrograms as a guide, so as to arrive at an analysis that accounted for as much significant variation with as few parameters as possible. In this way, we arrived at the model in Table 13.1, which has three significant main effects (including time), six two-way interactions, and one significant three-way interaction with time. In Table 13.1, parameter estimates in our best model are shown along with their Wald tests for significance, and the corresponding significance level. All non-significant effects are excluded from this model. The residual deviance for this model is 319.09, on 259 df, compared to a value of 632.95 on 169 df for the null (intercept-only) model, suggesting that the 10 parameters identified account for about 50% of the observed variation in the counts of cluster combinations.

Table 13.1 Log-linear model for Newgrounds Flash movies categorized by network position, genre feature clusters and cultural reference clusters, over time

	Estimate	Std. error	z value	Pr(> |z|)	
(Intercept)	−0.20700	0.13191	−1.569	0.116594	
Time	0.20463	0.02507	8.163	3.26e-16	*
GF 1	1.09593	0.07982	13.731	< 2e-16	*
CR 2,4	−0.93375	0.13130	−7.112	1.15e-12	*
Clockcrew**GF 3	0.73001	0.12472	5.853	4.82e-09	*
Clockcrew**GF 1,2	−0.34420	0.11204	−3.072	0.002125	***
Fulp et al.**CR 1	0.27749	0.12877	2.155	0.031167	**
Fulp et al.**CR 4	1.31709	0.52106	2.528	0.011480	**
VGDC**CR 5	−1.71193	0.70988	−2.412	0.015883	**
High Production**CR 2	2.79049	0.80070	3.485	0.000492	*
High Production**CR 2:Time	−0.51139	0.19650	−2.603	0.009254	***

Significance codes: * 0.001, ** 0.05, *** 0.01.

The three main effects in this model are Time, which indicates that the number of animations increases slightly over each time step, the Genre Feature Cluster 1 (GF 1), which is a bit larger than the other clusters, and the Cultural Reference Clusters 2 and 4 (CR 2,4), which are a bit smaller than the other clusters. Two interaction effects suggest that members of the Clockcrew tend to preferentially exhibit Genre Feature Cluster 3 (GF 3), while avoiding Genre Feature Clusters 1 and 2 (GF 1,2). Similarly, two more interactions suggest that Fulp et al. tend to exhibit Cultural References associated with Clusters 1 and 4 (CR 1, CR 4). The remaining two indicate that Cultural Reference Cluster 5 is less frequent among the VGDC group, while Cultural Reference Cluster 2 is more frequent among High Production authors, although this effect is declining somewhat over time.

Our strongest evidence of genre emergence is among members of the Clockcrew, who preferentially employ features associated with avatar movies (principally clock avatars and speakonia voices), while avoiding genre features associated with GF 1 and 2; Cluster 1 is the closest to the origin in the principal components analysis of the genre features, and so not strongly characterized by any specific features; hence, Clockcrew animations tend to be marked by one or more of the genre features we identified. Cluster 2 represents animations with game interactivity, so it appears that Clockcrew animators tend not to make Flash games.

The remaining significant interaction effects indicate that there is a tendency for certain groups to craft messages around certain specific cultural references: Fulp et al. favor messages involving general themes (CR Cluster 1, again at the origin) as well as members of the original Clockcrew, whereas VGDC animators tend to avoid references to the Star Syndicate, and High Production authors initially favored references to strong Internet-culture based evaluative language (“omg”, “wtf”, etc.), but tend to avoid it, even as strongly as they once preferred it, in the later time periods. We do not find strong evidence of association between the cultural reference clusters and the genre feature clusters, suggesting that at least at the level we have observed it, genres are not characterized by specific message content.

13.5 Discussion and Conclusions

Our investigation of genre emergence in the amateur Flash of Newgrounds authors has identified the importance of the genre features of avatar animations. These animations utilize highly abstracted characters to represent individuals in the Newgrounds community. Beyond this, they share other characteristics as well, such as their use in acting on the social positions of the individuals represented by their avatars. Social positioning is a pervasive aspect of interaction on Newgrounds, in part encouraged by the site’s design (there are weekly “awards” in several categories). Participants who can successfully elicit support from others stand a better chance of seeing their work pass judgment, and hence users obtain strength by organizing into mutually supportive cliques, which are potentially more successful at surviving in the competitive environment of Newgrounds. Moreover, these

cliques become loci of innovations, such as the avatar animation type, which are then cultivated as emerging genres by members of the clique.

These mechanisms, of competition, clique formation, mutual support, innovation and cultivation, represent potentially important yet previously unobserved processes in genre emergence. Other computer-mediated communication contexts, such as email discussion lists, Usenet newsgroups, weblog networks, wikis, social media sites like YouTube, etc. share many of the same circumstances that led to these processes on Newgrounds. Competition is common in online communication, as are the mutually supporting cliques that often follow it. Consequently it is reasonable to ask whether genre emergence in these contexts, as is arguably happening on YouTube [21], for example, is shaped by similar associations with social network position. To the extent that new circumstances beyond social network position might be observed to be relevant in additional contexts, such investigations can potentially go beyond the present study in further illuminating genre emergence.

Our observations of emergent genres on Newgrounds did not extend to being able to observe change in the structural features of the genres over time. On the one hand, this is a consequence of the size and the complexity of the study: we first had to demonstrate that characteristic message forms existed, and that these were associated with social positions, before we could examine their distribution over time. On the other hand, the fluidity of the genres and the rapid pace of change is also a major factor. For example, the core members of the original Clockcrew organized almost overnight, creating a small number of simple avatar animations in a short period in 2001, early in the history of Newgrounds as a Flash portal. Since then, we have observed several distinct avatar animation types, distinguished by subtle formal features in their avatars: Clockcrew, Lock Legion, Glock Group, Star Syndicate, Block Band, etc. Animators move among these groups as schisms develop and heal, although the Clockcrew and its forms have remained relatively stable over the 6 year period of observation.

Future studies of genre emergence may build on this work in a number of ways. First, we have only used a fraction of the social network information available on Newgrounds: users' reviews of others' Flash are available with rich commentary and numerical ratings on the various characteristics of the contributions. These furthermore have timestamps, so it would be possible to observe more closely the effects of social positioning as well as changing artistic tastes on genre emergence. Such data could substantially enrich the account presented here. In addition, members enter and leave the community, and may traverse it by passing through one or more social positions. Observation of the network dynamics, whether by logging changes in users' profiles, or as enacted in communication via reviews and forum posts, could also enrich the understanding of genre emergence. In connection with this, it may be useful to focus on specific events, whether external to the site (e.g. geopolitical events that influence the topics discussed), or internal ones (e.g. the formation of a schism in an author group). Whatever specific approach is taken, the social network approach coupled with an empirical analysis of message structure and content offers a powerful means to examine community and social process, and thereby illuminate how the adoption of new technologies leads to the development of new communicative forms.

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