The Impact of Digital Mediation and Hybridisation on the Form of Comics.

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For Alan and Scott, the reasons for this thesis.
For my wife Karol, the reason for everything.

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Abstract

The form of comics is undergoing a transition as digital display becomes an increasingly popular mode of consumption. This thesis examines the impact of digital mediation and hybridisation on the form of comics. Through an analysis of the work of theorists (e.g. Cohn; Groensteen; Hatfield; Miodrag) and practitioner-theorists (e.g. Eisner; McCloud), a model of comics is developed based on seven key characteristics of the form: space as time; simultaneous juxtaposition of images; closure between images; spatial networks; reader control of pacing; tablodic images; word and image blending.

A cross-disciplinary, practice-based methodology is used to examine the impact of digital mediation on these seven characteristics. The operation of a range of different formats of digital comic (webcomic; infinite canvas; malleable page; guided view; motion comic; hypercomic; game comic; audible comic) is analysed. Similarities between digital and architecturally mediated formats are considered. A series of prototype game comics is created to investigate the hybridisation of comics with the ludic qualities of videogames. A further game comic prototype is constructed to examine the integration of audible, time-based soundtracks.

The thesis concludes that different digital comic formats place greater or lesser emphasis on the seven identified characteristics of the form. Gallery-based hypercomics are shown to draw on approaches originally established within digital formats to meet the challenges of architectural mediality. Game comics are identified as hypercomics that exhibit some of the characteristics of games and use some of the key characteristics of the form of comics as the basis for their gameplay. The spatial nature of the form of comics is established as providing potential for synthesis with the spatial nature of videogames. Responsive soundtracks are demonstrated to support rather than conflict with the identified characteristics of the form.

1. Methodology

As digital display becomes an increasingly popular mode of consumption, the form of comics is undergoing a transition. Although originally developed within the confines of the printed page, today the form of comics is also commonly consumed through the screens of personal computers, smartphones and tablets. As the form changes to embrace the potential offered by these new platforms, it is useful to examine the key characteristics of the form in the context of these changes. This chapter outlines the research questions at the heart of this examination and introduces some of the central principles of my doctoral study. It then details the cross-disciplinary, practice-based methodology I have established in order to address these research questions.

This study analyses some of the new formats that have been made available to the form of comics by the widespread adoption of portable digital display devices. Included in this analysis has been a consideration of hybrid formats that incorporate multicursal, ludic and audible elements. While the primary focus of this inquiry has been on digitally mediated comics, it also explores how some of these formats may be further adapted via architectural mediation. Central to the study as a whole are the following four research questions:

How are the key characteristics of the form of comics impacted by:

1. Digital mediation and extension of the comic page?
2. The challenges of architectural mediality?
3. Hybridisation with the ludic qualities of the videogame?
4. The integration of audible, time-based soundtracks?

The inquiry based on these questions has been driven by the need to establish a critical vocabulary of ideas with which to examine newly emergent formats of comic. These ideas have both informed and been informed by the production of a number of prototype comics as part of an iterative creative process.

A key idea to the inquiry is the concept of "mediality" itself. Thon provides a useful definition of mediality as 'the set of prototypical properties that can be considered constitutive for a conventionally distinct medium' (2014, 334). He identifies the 'characteristically hybrid nature' (355) of digital media and asserts that digital mediation results in mediality becoming 'more "fluid," more tentative, [and] only valid until the next technological or institutional landslide' (336). Hague accordingly notes the 'relatively little stability' (2014, 26) in the field of digital comics, and the problems this can create for its study. The complexities of the study of digital comics are outlined by Wilde (2015), who explores several approaches to examining their mediality. The approaches Wilde identifies can be grouped into three main categories:

1. Analysis of the key differences between digital comics and other media (5).
2. Analysis of new similarities and points of comparison between digital comics and other media (8).
3. Reanalysis of the 'established qualifying factors of comics' within the context of digital mediation (9).

All three approaches can be seen at work to some extent within my study, but it is the reanalysis of the established qualifying factors that constitute the form of comics that has been central to my research. Hague provides a useful summary of the range of approaches and techniques applied to the wider study of comics (2014, 9). Amongst these are several that could potentially be applied to digital comics, such as semiotic, economic, sociological or historical study. Within this breadth of approaches, Hague notes that formal studies provide one 'area of common focus' (ibid) in the field. By identifying and examining the key formal characteristics by which the form of comics operates, I have been able to usefully apply this existing body of comic theory to the study of digitally mediated comics. A focus on form is also significant for the connection it makes to my previously established practice as a comic creator.

This professional doctorate builds on my existing body of work as a recognized pioneer within the fields of digital comics (Withrow 2003; Barber and Withrow 2005) and installation-based hypercomics (Round 2011; Charlesworth 2010; Gravett 2013). Over the last seventeen years I have amassed a portfolio of creative and experimental work that explores the potential of the digital comics form. This work was created in part as a response to the theories of McCloud (2000) and influenced by the form of hyperfiction and the ideas of scholars such as Aarseth (1997) and Murray (1997). As a practitioner I have self-identified as a formalist (Goodbrey 2004) within McCloud's 'four tribes' categorisation of comic creators (2006, 243). In much of my practice I have accordingly placed a priority on the 'understanding of, experimentation with, and loyalty to' (232) the form of comics.

In the initial phase of my doctoral study I began by seeking out appropriate theoretical models that could inform and contextualise my existing body of practice. Supported by the guidance of my supervisors I revisited the texts that had influenced my earlier work and used these as the starting point for a comprehensive literature review. By identifying key concepts and following up on the works of cited authors I widened my body of theory and constructed a map of the current state of the field. This provided me with a critical framework within which to begin identifying and analysing other significant works of comics practice. To further supplement my research I attended and contributed to a number of academic conferences focused on both comics and digital media. This resulted in an additional range of useful research leads.

Hague draws attention to the multidisciplinary nature of comic scholarship, noting 'the sheer diversity of routes into the study of comics, given that within each discipline there are ranges of methodological and perspectival foci to choose from' (Hague 2014, 9). My own approach to the subject can be defined as cross-disciplinary in nature. Lattuca identifies this term as being commonly used to describe research approaches 'that borrow either theories or methods' from other disciplines (2001, 113). Nissani asserts the need for such approaches, stating that

many ‘complex or practical problems can only be understood by pulling together insights and methodologies from a variety of disciplines’ (1997, 209).

In her own typology of interdisciplinary scholarship, Lattuca aligns cross-disciplinary research with the concept of ‘Informed Disciplinarity’ (2001, 79). Informed Disciplinary approaches feature research questions based in one discipline that necessitate ‘outreach to other discipline(s)’ for relevant methods, theories and concepts (81). Influenced by my background as a formalist practitioner, I began my study of comic scholarship with a focus on ideas that related specifically to the formal qualities of comics. My research questions then drove an outreach into other areas of study. Examining the digital mediation of comics led me to study a variety of texts that explored the properties and potential of digital media. The particular potential for hybridisation between comics and videogames led me towards theorists focusing specifically on the latter.

Videogame-related theory went on to inform several aspects of my study. My research first led me to encounter the methodology established by Juul in his identification of the key characteristics of games (2005, 36). It was by applying this methodology to my study of the form of comics that I developed a model of the key characteristics of the form. The role of three-dimensional space in videogames later contributed relevant ideas to my consideration of the challenges of architectural mediality in comics. Similarly, the approach taken to sound in videogames was influential to my study of the integration of audible soundtracks into digital comics. My examination of architectural mediality and audible soundtracks also lead to further cross-disciplinary outreach into other areas of relevant study such as installation art, locative media and sound in cinema.

In addition to building on an existing body of practice, my study has also been advanced via the creation of several new experimental comics. In this respect I have followed a practice-based methodology that has intertwined with my cross-disciplinary research. Yee notes that such mixes of methodological approach have become an ‘established paradigm’ for design research (2010, 16). Both Yee (2010,

5) and Sullivan (2010, 77) assert the growing support for practice within doctoral studies in art and design, although Biggs and Büchler note that there have been difficulties in reaching agreement on the terminology associated with such methodologies (2011, 82).

My own methodology aligns to Candy's definition of practice-based research as an 'original investigation undertaken in order to gain new knowledge partly by means of practice and the outcomes of that practice' (2006, 3). This is distinct from 'practice-led' research, which Candy states 'is concerned with the nature of practice and leads to new knowledge that has operational significance for that practice' (ibid). Yee asserts that doctoral studies in design are 'inherently practice-led […] either through studying the people, process, or products' of design practice (2010, 5). However, to be described as practice-based, studies must specifically use 'practice as the basis of investigation' (ibid).

The starting point for my own practice-based investigation was to approach each of my research questions in terms of the practical challenges they raised for comic creation. Supported by my growing framework of cross-disciplinary research, I then embarked on an iterative creative process to develop new comics that could explore these challenges and test possible solutions. In-depth accounts of the specifics of my practice-based research process are provided in Chapters Five, Six and Seven of this thesis. Gray and Malins highlight the value of practice in research for developing 'deep' understanding from 'an informed perspective on issues relating to practice' (2004, 105). However, they also caution that this approach can lead to 'indulgence and over-subjectivity' if not placed within a clear research framework (ibid).

Candy and Edmonds similarly highlight the importance to practice-based researchers of developing 'frameworks that guide their practice and the evaluation of the outcomes of that practice' (2011, 127). With the release of each completed comic for public dissemination, I went through a process of reflectively analysing and contextualising the work within my existing framework of theory. This analysis

was used to drive further theoretical research and, where appropriate, to trigger further cycles of creating, reflecting and contextualising. Candy and Edmonds identify this as a common approach amongst practitioners engaged in research, noting that in such studies there is 'a cyclical process of putting theoretical knowledge into practice and revising theory as a result of the outcomes' (2011, 127).

Candy and Edmonds highlight the importance of accompanying texts to contextualise the practical outcomes of doctoral research (125). However, they also note that direct experience of these works is 'usually necessary for a full understanding of the contribution to new understanding (knowledge) that the practitioner is making' (130). Unlike practice-led research, where the results 'may be fully described in text form without the inclusion of a creative outcome' (Candy 2006, 3), in practice-based research 'the role the works play in evaluation is vital' (Candy and Edmonds 2011, 130). Because of this, while my written thesis forms a significant part of my original contribution to knowledge, a full understanding of this contribution 'can only be obtained with direct reference' (Candy 2006, 3) to the creative outcomes of my study. Full details of these outcomes can be found in Appendix A.

The four digital comics created during my study involve aspects of hybridity between comics and videogames. In their study of research frameworks developed around the creation of interactive digital artefacts, Candy and Edmonds note that this can present 'the particular problem for the practitioner of understanding how audiences engage with specific works' (2011, 122). The development and public release of my interactive "game comics" provided me with several useful channels of qualitative audience feedback. During each comic's creation I received input via e-mail and one-to-one testing sessions with both academic colleagues and fellow comic practitioners. This feedback filled a similar role to playtesting in videogame design (Fullerton 2008, 248) and allowed me to refine and iterate on each piece in terms of its gameplay and usability.

Completed comics were released through online channels of dissemination aimed primarily towards casual gaming communities. Public feedback on the comics was received via e-mail, the comments on casual gaming websites and playthrough videos uploaded to *YouTube*. This public response fed into the evaluation and analysis of each comic, influencing both the development of my theoretical framework and future iterative cycles of comic creation. In the refining of my theoretical framework, I have also sought out regular opportunities to publically disseminate my work and receive feedback on my ideas. Throughout the course of my research I have presented multiple conference papers focused on different aspects of my study. A full listing of these papers is provided in Appendix B.

Public peer review has proved to be an invaluable part of my methodology. Presenting my findings at comics and digital media conferences has allowed me to disseminate my findings amongst the wider academic community and receive feedback from others working within these fields of study. Typically I have sought to present each paper across several conferences, iterating and refining my work based on the input and research leads this generated. At the completion of each conference cycle I have aimed to further disseminate and refine my thinking by seeking a channel for peer-reviewed publication. I have found this strategy extremely helpful in refining my thinking and developing the quality of my academic writing. It has also resulted in the publication of a number of peer reviewed outcomes, including three journal articles and three book chapters. These published outcomes have then gone on to form the basis for the written component of my final thesis. Full details of the original publications can be found in Appendix C.

In accordance with the methodology outlined in this chapter, the second chapter of this thesis provides an account of my cross-disciplinary literature review with a primary focus in comic scholarship, supported by informed outreach into games and media theory. This review leads towards the identification of the key characteristics of the form of comics, which is documented in detail in Chapter Three. Chapter Four focuses on how these characteristics have been impacted by different approaches to digital mediation and extensions of the comic page.

Chapter Five examines the hybrid format of the hypercomic, both in terms of digital mediation and the new challenges raised by architectural mediality. It contextualises my existing body of work as a hypercomic practitioner and presents a major case study based on a new architecturally mediated hypercomic, *Black Hats In Hell* (Goodbrey 2013a).

Chapter Six explores the potential for hybridisation between the form of comics and the ludic qualities of videogames. The chapter presents a case study based around the creation of three new hybrid game comics, *A Duck Has An Adventure* (Goodbrey 2012), *Icarus Needs* (Goodbrey 2013b) and the unpublished work, *Margaret Must Succeed* (Goodbrey 2013c). Chapter Seven explores the implications of videogame hybridity for the integration of audible, time-based soundtracks into digital comics. It examines a number of existing examples of audible digital comics and presents a major case study based on a newly created game comic, *The Empty Kingdom* (Goodbrey 2014). In the final chapter of my study I offer the conclusion to my thesis, identify my original contributions to knowledge and practice and outline some key opportunities for future research.

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2. Literature Review

This chapter provides a review of key literature in the study of the form of comics and its recent digital mediation and hybridisation. The initial focus is on comics scholarship and its English-language origins in the works of influential practitioner-theorists. The growth of scholarship in the field is examined, including the recent impact of the translation into English of key texts by francophone scholars. Literature focused specifically on digital comics is then considered, ranging from the early work of practitioner-theorists to the growing body of writing found within comics scholarship. This is followed by an informed, cross-disciplinary outreach into areas of media and games theory that have been of particular use in considering the digital mediation and hybridisation of the form. The review concludes by considering my own contributions to the recent growth in digital comics scholarship.

The Form of Comics

The foundations of the English-language study of the form of comics can be found in the writing of a small number of comic practitioners and practitioner-theorists. The most influential of these are the works of Will Eisner and Scott McCloud. Eisner's *Comics and Sequential Art* (2003) was originally published in 1985, although there were additions and revisions to the work throughout his lifetime (Eisner 2008, ix). McCloud's *Understanding Comics* (1993) was published eight years later and builds on Eisner's work to provide a more in-depth examination of the form.

Eisner begins his book by identifying comics as one example of a form he defines as 'sequential art' (2003, 5). He describes comics as having 'the characteristics of a language' that requires an ability to read their 'image-word mix' in order to be understood (7). This focus on comics as either a sequence of images or as a mix of word and image are two important and at times opposing themes that recur throughout later studies of the form. Eisner goes on to provide a useful

examination of the narrative uses of various elements such as speech balloons (26-27), panels (28-43), panel borders (44-61) and page compositions (62-87), illustrating the discussion with examples from his own extensive body of work.

In *Understanding Comics,* McCloud provides a now commonly used definition of comics as 'juxtaposed pictorial and other images in deliberate sequence' (1993, 9). McCloud uses Eisner's concept of sequential art as the starting point for the creation of this definition but introduces the concept of juxtaposition as a way to more clearly separate the sequences of images found in comics from those found in animation. He notes that 'the basic difference [between animation and comics] is that animation is sequential in time but not spatially juxtaposed as comics are' (7). The importance of this spatial juxtaposition between images informs much of McCloud's writing on the form.

In examining how the reader understands and makes meaning from the juxtaposed images in comics, McCloud identifies the concept of 'closure' as being a fundamental part of this process (67). Closure is a term borrowed from gestalt theory (Hatfield 2009, 135). McCloud describes closure as the act of 'observing the parts but perceiving the whole' (63) and he provides several examples of its use both in everyday life and in other forms such as film and photography. In comics, McCloud asserts that it is closure which allows the reader to connect together spatially juxtaposed series of images and 'mentally construct a continuous, unified reality' (67). McCloud views the reader as 'a willing and conscious collaborator' in this process, with closure acting as 'the agent of change, time and motion' in the form of comics (65).

McCloud goes on to examine the representation of time within comics, noting that individual panels may not necessarily represent single moments in time but instead can depict varied segments of time, depending on their content (94-97). He explores some of the ways in which the content, spatial arrangement, size and style of panels may influence the reader's interpretation of narrative time (98-117). During this discussion he also draws particular attention to the role that word

balloons and sound effects can have on this process of interpretation. Although McCloud asserts that comics don't 'have to contain words to be comics' (8) and thus excludes 'words and pictures in combination' from his definition of comics (152), he does acknowledges the importance of this combination to the form. He identifies seven distinct categories of interaction between words and images in comics (word specific, picture specific, duo-specific, additive, parallel, montage and interdependent) and explores a variety of examples of their usage (153-161).

In early English-language academic writing on comics, both sequentiality and the mix of word and image are discussed as important characteristics of form. Sabin for example describes comics as being fundamentally 'narrative in the form of a sequence of pictures – usually, but not always, with text' (1993, 5). Later he notes the importance of the textual elements of the form, describing comics in a similar manner to Eisner as 'a language' in which words and images 'combine to constitute a weave of writing and art' (1996, 8). Harvey takes direct issue with McCloud's definition of comics for excluding single panel 'gag cartoons' from being treated as part of the form (2001, 76). Rather than sequential juxtaposition, he instead asserts that the 'essential characteristic' (75) of the form is the blending of words and pictures to achieve 'a meaning that neither conveys alone without the other' (75-76). Such definitional debates around the relative importance of different characteristics of the form are a theme that can be seen to recur throughout the academic study of comics.

Sabin notes the existence of a tradition of semiotic analysis of comics in Europe (1996, 9), but because these works had at the time rarely been translated, they had seldom been studied by English-language scholars. The first major French-language comics theory book to be made available in English is Beaty and Nguyen's translation of Thierry Groensteen's *The System of Comics* (2007). This seminal work draws on the existing body of francophone comic studies and contributes a number of important ideas to the study of the form of comics. Groensteen identifies the central characteristic of the form of comics as 'iconic solidarity' which he defines as 'interdependent images that, participating in a series, present the double

characteristic of being separated […] and which are plastically and semantically over-determined by the fact of their coexistence in praesentia' (18).

Groensteen sets out to 'describe the entirety' of the relations between images operating in iconic solidarity, which he groups under the term 'arthrology (from the greek *arthron*: articulation)' (21). Arthrology is quite a broad concept, covering both the transmission of meaning in comics and artistic qualities of physical composition. He examines how comics make use of panels in page and double-page groupings (30-39), sets out the role played by the frames around each panel (39-57) and discusses the artwork inside the panels, which he categorises under the term of 'narrative drawing' (161).

Groensteen discusses the role of space in the portrayal of time in comics (21), taking a similar stance to that of McCloud (1993, 7). In his later writing Groensteen draws direct parallels between iconic solidarity and McCloud's juxtaposition-based definition, which both rely on the reader interpreting 'several images sharing the same space' (2012, 113). Where Groensteen and McCloud diverge, is that while McCloud's definition focuses on images in sequence, Groensteen argues that the organising principle of comics is 'not that of the strip, nor that of the chain, but that of the network' (2007, 146). While this network may contain images intended to be read in sequence, it also exists in a 'dechronologized mode' that allows for the possibility of 'translinear relations and plurivectoral courses' through the text (147).

Writing in English, Groensteen later provides a further useful overview of French-language comic theory in 'The Current State of French Comics Theory' (2012). Here he discusses the difficulty of reaching an agreed definition of comics due to the multiple formats, cultures and industries across which the form has developed (112-114). He also observes a difference in approach to the form between himself and McCloud, noting that for French scholars:

> the page is the reference unit of the comics language. This is an important difference with Scott McCloud's approach… [which] …examines very

> carefully and pertinently panel-to-panel relations, but without ever having consideration for the complete page (114).

In the article Groensteen points towards the work of other theorists, including Baetens' (2001) English-language analysis of the French-language work of Philippe Marion. Marion's work is notable for introducing the theory of 'graphiation' which Baetens describes as 'the graphic and narrative enunciation of comics' (147). Graphiation concerns 'the aspects of the image where one can read and discover something of the idiosyncratic gesture which produced the drawing' (ibid) and provides a useful tool for the discussion of individual graphic styles in the artwork of comics. Graphiation also shares some similarities with Groensteen's concept of narrative drawing, as both ideas link the artwork in a comic directly to the act of drawing that created it.

Despite these initial efforts to bring French-language theory to an English-reading audience, Miller and Beaty note that Groensteen's translated work stands 'isolated from the critical context that helped shape' it (2014, 13). They address this issue directly with the publication of *The French Comics Theory Reader* (2014), in which they translate a number of key texts into English. Amongst these texts, Lacassin's work is useful for its examination of speech balloons and textual sound effects (2014, 39-40). These aspects of the form are also explored by Smolderen, who examines the representation of sound in comics (2014, 53). Smolderen focuses on the hybrid nature of comics as a form that combines word and image to create 'an audiovisual stage on paper' (47). This focus on comics as a blend between word and image is continued by Baetens and Lefèvre (2014). The pair categorise the different uses of words in comics (184) and then go on to cover similar territory to McCloud in outlining some key principles of interaction between word and images (188-189).

Bouyer provides a useful overview of the origins of the semiotic study of comics and the debate arising around the idea of 'specificity' or the 'elements that belonged naturally to comics, and only to comics' (2014, 87). Groensteen, in the first of his contributions to the volume, notes that the search for specificity can be

complicated by the personal styles of different creators (2014a, 67) and the need to take into account the full diversity of past, present and future comics (69). In his second contribution, Groensteen again looks at attempts to define comics, warning that too narrow a definition can result in excluding 'the more minority, atypical or experimental works' from study (2014b, 97). While noting that comics rely on 'an original way of using images and text, and creating interplay between them' (102), he cautions against using this as a definition that would exclude comics that rely only on images (107).

In discussing the differing definitions of McCloud and Harvey, Groensteen notes the importance of both sequentiality and word and image interaction, viewing the two ideas as complementary aspects of the form (107). He also points towards the work of Miller, who in her book *Reading Bande Dessinée* (2007) provides a useful English-language overview of critical approaches to French-language comics. Miller contributes an important summary of the operation of the form of comics, which she describes as producing 'meaning out of images which are in a sequential relationship, and which co-exist with each other spatially, with or without text' (75).

The growth in availability of translated French-language works has provided further fuel for the development of English-language comics theory. American comics scholar Neil Cohn provides a useful overview of the difficulties involved in defining comics (2005), identifying a similar range of issues to Groensteen (2012). Cohn goes on to explores the relationship between space, time and sequence in the form (2010), providing a useful critique of the theories of McCloud and Groensteen. This leads in to a detailed examination of how the reader derives their sense of time in a comic's narrative based on the role played by panels as 'units of attention' within a sequence (142).

Cohn further explores the role of 'attention units' in his book, *The Visual Language of Comics* (2013, 56). During the book Cohn puts forward a similar view to that of Eisner, describing comics as a form that 'can be written in both a visual language (of images) and a written language (of text)' (2). He examines in detail the role played

by captions, speech balloons and thought bubbles as interfaces between these visual and written components (35-37). He also looks at the use of graphical 'schema' in comics (10), exploring similar territory to Marion in examining how different artists build up their own individual schemas of representation within their artwork (24-34).

Touching on some of the same issues raised by Groensteen and Cohn, Witek notes that attempts to identify the key characteristics of the form of comics has resulted in 'more semantic quibbling than productive critical inquiry' (2009, 149). Rather than continue this debate, Witek instead focuses his own study on 'formal conventions that were once commonly used in comics and have now nearly disappeared' (ibid). He examines in detail the changing use of panel numbering (150-151) and directional arrows (152), and the impact these have had on reading practices, panel shapes and page layout (153-156). Page layout and panel shapes are examined further by Lefèvre in his study of 'The Construction of Space in Comics' (2009). Lefèvre explores the use of the panel as a framing device and notes how different panel shapes can complement the composition of the scene depicted in the comic (157-159). He also highlights the importance of the non-diegetic space around each panel and touches on some the ways this space can be varied to achieve different effects (160-161).

Hatfield's aptly-titled 'An Art of Tensions' (2009) examines comics in terms of the tensions that are at work within the form. Hatfield observes that in reading a comic, tensions exist when 'various ways of reading – various interpretive options and potentialities – must be played against each other' (132). These include a tension between the reading of words and images (133-134), a tension between single images and sequences of images (135-139) and a tension between reading a sequence and observing the larger layout of which it is part (139-144). Hatfield notes that this last tension can also be seen as part of a larger tension between treating comics as reading experiences and 'the dimensions of comics as material objects' (144). This focus on the materiality of comics is continued by Priego in his study of digital comics (2010), as detailed later in the chapter.

Meskin examines existing definitions of comics within the context of the philosophy of aesthetics, criticising formalist approaches for their 'failure to take into account the historical contexts in which works of art are produced' (2007, 374). He criticises McCloud's definition for being both 'too limiting' in the constraints it puts on the intentions of comic creators and for allowing 'far too many things' to be counted as examples of the form (370). He asserts that efforts to reach a definition serve 'no pressing need' and concludes that definition itself is 'unnecessary to the proper evaluation and interpretation' of comics (376). Beaty highlights similar issues to Meskin in his criticism of formalist definitions, favouring instead a social definition that 'has the advantage of not relying on the specific features' of comics and instead focuses attention towards their 'social classification' (2012, 36). Drawing from institutional definitions at use in the wider arts world he defines comics as 'objects recognized by the comics world as comics' (37). He asserts that such a definition allows comics to be 'better understood through the collective activities that constitute their production and circulation' than via specific formal characteristics (ibid).

Miodrag's *Comics and Language* provides an overview of the origins and development of comics scholarship (2013, 3-7) and contributes an extensive analysis of the form across three distinct areas. In the first section of the book, Miodrag examines the role of words in comics, considering how the fragmentation and spatial arrangement of written textual elements can influence meaning and reader understanding (66-69). With reference to the ideas of McCloud, Sabin and Harvey, the second section of the book begins with an examination of the hybrid nature of comics and the diverse range of interactions that exist between word and image (83-99). This leads into an analysis of the use and operation of the speech balloon (100-106), covering some similar ideas to those put forward by Cohn (2013, 35-37).

Miodrag adopts Groensteen's view of comics as a spatial network, using this as the basis for an examination of the portrayal of fictional time in comics (108-141). Her

analysis also considers the related concepts of sequentiality, juxtaposition and attention units, providing a critical examination of the work of McCloud, Groensteen, Cohn and Hatfield. The final section of the book focuses on the artwork in comics, with examples drawn from a range of different cartoonists' work. Based on these examples, Miodrag considers debates around the treatment of images as a language (169-196) and explores issues relating to individual artistic style (197-220). She also examines common approaches to composition in comics, highlighting similarities in compositional techniques between panels in comics and shots in film (221-245).

The growth in comics scholarship has led to the study of a wide variety of different types of comic, including some examples of the form that operate outside of traditional printed formats. Gravett, for example, examines a number of architecturally mediated 'gallery comics' that are designed to inhabit 'the white cube of the art gallery' (2013, 131). These comics exhibit many of the spatial and narrative qualities typically associated with installation art (Rosenthal 2003; De Oliveira et al. 2003; Coulter-Smith 2006). Mutard (2013) explores ways in which the form of comics can adapt to gallery spaces, considering issues around readability, panel scale and the opportunities afforded by specific architectural features. Dittmer (2011) touches on similar themes in his analysis of McKean's gallery comic opus, *The Rut* (2010). Hague's study of *Comics and the Senses* (2014) also proves relevant to the topic, particularly in the comparison it offers between the different viewing practices associated with comics and sculpture (53).

Digital Comics

Similarly to print comics, much of the important early English-language writing about digital comics is found in the work of practitioners and practitioner theorists. More recent years have however seen a significant increase in the discussions and analysis of digital comics within comics scholarship. Ernesto Priego notes in his doctoral thesis that 'discussion of digital comics, in and out of academia, has

increased significantly, gradually reaching the mainstream as a relevant topic' for study (2010, 10). As the study of digital comics has progressed, it has also contributed a number of ideas of wider significance to the study of the form of comics as a whole.

The first major work to examine digital comics was McCloud's *Reinventing Comics* (2000a). The second half of the book, entitled 'Catching a Wave' (127), focuses specifically on the impact of computing on comics and examines the implications of digital production, distribution and mediation. The focus on digital mediation in the chapter 'The Infinite Canvas: Digital Comics' (200-241), is of specific importance to my study. It examines some of the then-current approaches taken to digital comics on CD-ROMs (208) and the World Wide Web (216) and puts forward McCloud's view of the form of comics as a 'temporal map' (207).

McCloud proposes that the 'essence' of comics is that they operate as an 'artist's map' of time, with the progression through a spatial sequence of panels equating to a progression through narrative time (206). Cohn provides a useful clarification of McCloud's position as 'not "physical space = fictive time" but rather "physical space = physical reading motion = fictive time"'(2010, 132). Cohn does not however agree with McCloud's thinking, noting that a panel does not necessarily represent a single moment in time but rather it is the progress through a sequence of panels or depicted moments within a panel from which a sense of time in the comic is constructed (134). Miodrag notes the popularity of the temporal map concept and asserts that while it 'aptly describes certain kinds of transition… …it certainly does not define' comics as a whole, instead favouring Cohn's approach to the subject (2013, 140).

McCloud proposes the temporal map as a simplification of the essence of comics that might allow the form to adapt and evolve into new digital formats (2000a, 207). One such new format is that of the scrollable and zoomable 'infinite canvas' (222). In an infinite canvas comic, the screen acts as a window onto a much larger arrangement of panels, some of which remain unseen. This idea is of particular

significance within the development of both my own practice and the field of digital comics a whole. McCloud further develops his thinking on the infinite canvas in the multipart webcomic 'online appendix' to *Reinventing Comics*, entitled *I Can't Stop Thinking* (2000-2001).

During the series McCloud discusses different approaches to creating and monetising webcomics. In part four (2000b) he introduces the concept of the 'trail' as an aid to reading and navigation in infinite canvas comics. In this respect the trail fulfils a similar function to the directional arrow in the early print comics discussed by Witek (2009, 152). McCloud provides an exploration of various 'new storytelling opportunities' (ibid) that the infinite canvas format affords to creators, including the potential to use variations in the spacing between panels to suggest different amounts of time passing within the narrative. While sharing some similarity to the techniques identified by Lefèvre in the placement of panels in print comics (2009, 160-161), the infinite canvas approach means much larger areas of continuous space are available to exploit.

The storytelling opportunities of digital comics are further explored by webcomic pioneer John Barber in his Master's thesis, *The Phenomenon of Multiple Dialectics in Comics Layout* (2002). Building on ideas from McCloud (1997), Barber examines several aspects of layout in both print and digital comics. He emphasises the importance of reader control over 'the rate at which information is absorbed' (2002, 7) in a comic. This 'inherent' (ibid) characteristic of the form is often overlooked in the study of print formats but is particularly significant when considering the potential for animation in digital comics to disrupt the traditional reading process. The importance of reader control in this digital context is later stressed by comic creators such as Waid (O'Reilly Media 2013) and Del Toro (Levine and Murdoch 2011). Barber goes on to examine some of the storytelling possibilities of animation in his own webcomic practice. He explores in detail his pioneering approach to 'malleable' digital pages (63), in which the screen acts as a stage onto which panels can appear or disappear, forming new compositional groupings and layouts.

With the growth of the webcomic scene through the late 1990s and early 2000s, many of the writers who followed McCloud focussed specifically on web-based aspects of digital comics. The first book to provide a useful overview of the field was *Toon Art: The Graphic Art of Digital Cartooning* (Withrow 2003). After an initial focus on the processes and techniques of webcomic creation (18-59), Withrow presents 'a showcase of the best in the business' (60) that documents a representative cross-section of popular contemporary webcomics. In addition to webcomics, the showcase includes examples of web-based hypercomics (178-179) and early examples of the animated motion comic format (112-113).

The creator-centric approach of *Toon Art* continues in the follow up book*, Webcomics: Tools and Techniques for Digital Cartooning* (Barber and Withrow 2005). In this edited volume a cross-section of leading webcomic creators provide first-hand accounts of their working method, accompanied by short interviews that outline the shape of their careers to date. A more in-depth history of webcomics as a whole is provided by Campbell in *A History Of Webcomics* (2006). Campbell documents the development of webcomics from their origins and early years in the mid-1990s through to the diverse and well-established industry of the mid-2000s. The book identifies the origins of popular formats and approaches to webcomics and examines the impact of key figures like McCloud on the development of the scene. Taken together with *Toon Art* and *Webcomics*, the book provides a useful resource for the identification of significant works of practice and acts as a valuable source for the contextualisation of my existing body of work as a webcomics practitioner.

French cartoonist Yves "Balak" Bigerel's *About Digital Comics* (2009) manifesto serves as an important link between the webcomic scene and the emerging market for tablet-based digital comics. Bigerel proposes an approach to digital comics that is similar in many aspects to Barber's malleable page, but with a deliberate refusal to employ any 'temporal effects' (ibid) such as animation or moving panels. *About Digital Comics* forms the basis for the 'Turbo Media' format adopted by a number

of French webcomic creators (Tuska 2009). This format was later also adopted by the American digital comics site, *Thrillbent* (Waid 2012a). Comics writer and *Thrillbent* founder Mark Waid describes *About Digital Comics* as providing 'the foundation… [for his] …entire mindset and mission' (2012b) in establishing the site. Waid and Bigerel were then hired to help the US publisher *Marvel Comics* develop their new brand of *Infinite Comics,* bringing Bigerel's format to Marvel's already established tablet-based digital comics readership.

Priego's doctoral thesis, *The Comic Book in the Age of Digital Reproduction* (2010), examines digital comics through the lens of materiality, which Priego defines as:

> the physical media or platforms in and through which texts are created, stored, conveyed, disseminated and received; the term does not only imply the physical qualities of a given object, but to a complex process involving cultural practices as ways of interacting with them throughout time (15-16).

Priego examines the materiality of both print and digital comics as a way to 'engage with the media-specific qualities of comics as both image-texts and multimedia […] publications' (16). Through structural analysis of a range of examples (101-113), Priego demonstrates that digital comics share with print comics 'similar structures and relationships between the written word and the graphic image' (114). His thesis provides an invaluable history and analysis of early digital comic formats and associated terminology (224-226). He also provides an in-depth study of the emergence and development of the webcomic, including close analysis of a number of significant examples of the format (253-316).

The motion comic format provides the focus for Smith's doctoral thesis, *Motion Comic Poetics: A Study in the Relations between Digital Animation and the Comic Book* (2013). Smith identifies this format of digital comic as a type of 'hybrid animation, directly influenced by existing comic book narratives and artwork' (254). He examines the relationship between comics and animation and the impact of digital mediation both on this relationship and the wider comics industry (12-24).

The thesis provides a detailed analysis of how animation is employed within motion comics (98-148) and also broadens its scope to consider a variety of other digital comic formats that also employ elements of animation (149-199).

In *Comics and Narration* (2013), Groensteen dedicates a section of the book to discussion of 'the theoretical and artistic' aspects of digital comics (64). He notes that computers have become 'omnipresent' in comics production (ibid) and that digital comics can have an increased continuity of platform from production to consumption (65). In terms of materiality, he examines the loss of tactile qualities and the weakening of 'spatial memory' that comes with the transition from printed to digital comics (66). He asserts that as a result of these differences, the screen may be better suited to shorter works rather than novel-length narratives (67). He also makes a clear distinction between digital comics that primarily maintain page-like groupings of panels and those like the work of Barber and Bigerel that take more control over the reader's progression through sequences of panels (67-68).

Groensteen goes on to discuss the potential for the incorporation of animation and audible sound into digital comics. In this discussion he identifies an essential conflict between 'the concrete, measurable time of motion and sound, and the indefinite, abstract time of comics narration' (70). Taking a similar stance to Barber, Groensteen asserts the importance of comic readers setting 'their own rhythm' in the pace at which they progress through the reading of a comic (ibid) and that a true fusion between comics, motion and sound is difficult to achieve (71). He also briefly examines a range of other digital comic tropes, including zooming, malleable panel compositions, the infinite canvas and multicursal narratives (72-75). He concludes that digital comics are 'intrinsically hybrid, cross-fertilizing the comic system' with elements taken from animation, videogames and the World Wide Web (75).

Hague discusses several examples of digital comics in his study of *Comics and the Senses* (2014). He explores a variety of ways in which comics operate as sources of audible sound (68-81) and in examining 'Sounds in Comics' focuses specifically on

digital comics with integrated audio elements (73). He discusses the uses of audible (as opposed to textual or graphically represented) sound as an element of a comic's narrative. He then examines the use of responsive audible soundtracks in which sound 'responds to the reader's position in the narrative' (76). Hague's study also considers the relationship between comics and the sense of touch, which includes comparisons between paper and screen-based comics (100). He highlights the physical cues to progression through the narrative that are present in printed comic books but absent in their digital equivalents (108-110). He also notes the importance of the touchscreen and haptic feedback in adding new elements of physical interaction to the process of reading of digital comics (110-112).

Media and Games

The analysis of the digital mediation and hybridisation of the form of comics has necessitated an informed, cross-disciplinary outreach across a range of relevant media and games theory. As discussed in the previous chapter, Thon's writing on mediality and the fluid nature of digital mediation (2014) has proved of particular relevance to my inquiry. Also important are Bolter and Grusin's connected concepts of immediation and hypermediation (1999). These ideas have been useful in discussing some aspects of the relationship between the reader and the devices on which digital comics are read. Immediation indicates a transparent media while hypermediation conversely indicates a more opaque media which requires more conscious effort from the reader to navigate. While tablet-based digital comics initially strove towards increased immediacy, later comics that have more fully exploited the properties of tablet devices have led to increased hypermediacy in the reading experience.

Research into the origins of the hybrid hypercomic format led towards an examination of hypermedia and the study of Ted Nelson's famous conjoined texts, *Computer Lib / Dream Machines* (1974). These twin works lay the groundwork for the concept of hypermedia, which Nelson defines as 'branching and performing

presentations which respond to user actions, systems of prearranged words and pictures (for example) which may be explored freely or queried in stylized ways' (313). The texts also contain the proposal for the first 'hyper-comic' which Nelson envisions as being used in an educational context, describing an example in which 'the screen holds a comic strip, but one which branches on the student's request' (316). As such these are key sources towards the establishment of a clear history of digital comics and the hypercomic format. In looking beyond Nelson's work and studying the development of hypermedia, Landow's *Hypertext 2.0* (1997) is of use. The book examines a range of ideas relevant to hypercomics, including the structure of multipath texts as networks of linked lexia and the role of the reader in navigating these structures.

In my own practice as a hypercomic creator, the works of Aarseth (1997) and Peacock (2005) have been of particular influence. Aarseth's writing on the nature of ergodic literature and the phenomena of tmesis make this a key text for discussion of the hypercomic format. In an ergodic text such as a hypercomic, 'nontrivial effort is required to allow the reader to traverse the text' (1997, 1) and the reader's experience of the work can be locally unique, based on the choices made while navigating the text. Aarseth relates the reader's act of skipping over or missing out sections of an ergodic text to Barthes' concept of tmesis (78-79). Peacock takes the concept further, using tmesis to describe the 'received experience, where the experience of the user/reader/player includes their awareness of (in)completion, (in)completedness and (in)completeability' (2005). Peacock links tmesis to the concept of cursality, and the apprehension by the reader that there are multiple potential paths through the text that can be followed.

Murray's writing on the characteristic pleasures experienced by users of digital media (1997) contains ideas relevant to both the digital mediation of the form of comics and the hybridisation of comics and videogames. Similarly to Thon's observation of the fluidity of digital media (2014, 336), Murray examines the 'pleasure of transformation', noting that digital formats 'become more plastic, more inviting of change' (1997, 154). This phenomena can be seen at work in the

malleable pages of digital comics that follow the work of Barber and Bigerel. Murray also discusses the pleasure of 'agency', which she defines as 'the satisfying power to take meaningful action and see the results of our decisions and choices' (126). Linked to agency is the pleasure of 'spatial navigation', which Murray notes 'can be pleasurable in itself, independent of the content of the spaces' (129). Different approaches to player agency and spatial navigation can be important factors to consider when analysing and comparing examples of hybridisation between comics and videogames.

Drawing on a range of theorists, Juul provides a useful analysis of games and from this study derives his own definition based on six key features of the form (2005: 36). As discussed in the previous chapter, this approach influenced the design of the methodology for my own inquiry into the form of comics. Juul's examination of the phenomena of casual gaming (2010) is also of influence to the practice-based side of this inquiry. My development of a series of hybrid game comic prototypes draws on Juul's analysis of the use of excessive positive feedback (45) as part of the aesthetic and reward system of casual games (typically achieved through the use of exaggerated elements of audio and animation). The creation of these game comic hybrids draws on Fullerton's examination of games design (2008), which places an emphasis on play and playtesting as a central aspect of the design processes.

Montfort's analysis of adventure games asserts the importance of exploration as an aspect of gameplay (2005, 4). For game comic prototypes that sit within the adventure game genre, he provides a useful analysis of the key characteristics of the genre (23) and the role of puzzles within adventure game narratives (3). Gazzard writes on the spatiality of videogames (2013), touching on a number of ideas of importance to the study of game comic hybrids. Like Montfort, she asserts the importance of discovery (8) and exploration (59) in videogames and examines how the unlocking of space through play can act as part of a game's reward structure (2011). She also takes Aarseth's concepts of aporia and epiphany (1997) and applies them to acts of gameplay. Gazzard notes that in this context, aporia can be thought of as the pause a player takes in order to solve a puzzle, while epiphany

is the realisation of the solution that allows for further progression (2013, 103). Examining the use and distribution of these aporia/epiphany loops is a helpful tool with which to analyse and compare the game-like qualities of different game comic prototypes.

Nitsche (2008) provides further insight into the uses of space within videogames. His focus on navigation (28) and storytelling (106) in three-dimensional space is of particular relevance to the inquiry into the challenges of architectural mediality in comics. This inquiry also draws from Peacock's work on the use of perceptual tags in locative media (2009) and Coulter-Smith's examination of narrative in installation art (2006). Farrell (1997), Rosenthal (2003) and De Oliveira et al. (2003; 2004) are similarly of use for their examinations of the role of three-dimensional space in installation art. Nitsche later writes on the use of sound in videogames (2008, 129-144), which is relevant to the study of audible sound in digital comics. Hague's writing on responsive audible soundtracks in digital comics (2014, 76) has parallels with Nitsche's analysis of similar approaches to 'adaptive audio' in videogames (2008, 135).

The use of audible sound in digital comics can be compared with the use of sound in film. Bordwell and Thompson (2013) provide a useful definition of diegetic and non-diegetic elements in film that can also be applied to digital comics. The relationship between sound and the diegesis is explored in depth by Chion in his seminal work, *Audio-vision* (1994). Chion's writing on the temporal nature of sound in film (4) aligns with the observations of Hague (2014, 77) on the nature of audible sound in digital comics. Chion introduces the idea of 'synchresis' which he defines as 'the spontaneous and irresistible weld… [between] …auditory and visual phenomenon when they occur at the same time' (1994, 63). This is a useful concept with which to further explore the issues raised by Groensteen on the difficulty of integrating audible sound with the visual elements of the form of comics (2013, 71). Chion's concept of the 'added value' sound brings to images (5) and the role of 'territory sounds' in establishing a location (75) are also of use in examining the operation of various examples of audible digital comics.

Growing the Field

In the course of my study I have sought to promote the discussion of digital comics within comics scholarship. During the multiple presentations of my work at major national and international academic conferences (as outlined in my methodology), I have made use of the plenary sessions at these events to call for more coverage of digital comics. In 2015 I was responsible for organising the first English-language digital comics symposium, *The Comic Electric*. This event showcased the recent growth in the study of digital comics, gathering scholars and practitioners from around the globe to deliver papers on various different aspects of the field. The symposium was held in conjunction with the NESTA funded *Electricomics* project (Electricomics CIC 2015a).

Electricomics is a research and development project aimed at exploring different ways to 'change and enhance a traditional print based medium through the development of an adaptable and easily accessible toolset' for digital comic creation (Electricomics CIC 2015b). Parallel with my doctoral studies I have also worked as a research partner and consultant on the project. Overall the project has provided me with an invaluable insight into the differing points of view held by a range of comic creators as they consider the design decisions involved in the creation of digital comics. In addition the project gave me the opportunity to work with my fellow research partner Alison Gazzard to co-author the paper, *Electricomics: Digital Pages and Rhythms of Reading* (2014). This paper contributes some significant ideas to my doctoral study, including the role of the infinite canvas in enhancing the 'flippy-throughiness' (Nichols 2016, 97) of digital comics and the ways in which animation can impact on established rhythms of reading.

During my studies I have also worked to provide more publishing opportunities for scholarly writing on digital comics. This has involved proposing and editing two

peer-reviewed journals focussed on digital comics. *Writing Visual Culture Volume 7* (2015) was edited by myself and *Networking Knowledge Volume 8.4* (2015) was co-edited with Jayms Nichols. Articles featured in the journals range in focus from studies of the relationship between webcomic creators and their audience (Johnston 2015; Romaguera 2015) to examinations of the crossover between digital comics and film (Taylor 2015) and theatrical performance (Bremgartner 2015).

Amongst this growing body of scholarly writing are some articles that have particular relevance to my own doctoral study. Nichols' research into acts of reading in print and digital comics has been significant (2013), as has his analysis of the different ways in which print and digital comics direct the reader in their reading (2015). His identification of the phenomenon of flippy-throughiness is particularly important (2016). Relating to similar ideas put forward by Hague (2014, 108-110) and Groensteen (2013, 66), Nichols' term refers to how the material qualities of a printed comic can aid in navigating through the pages of the text. Wilde's discussion of the mediality of digital comics (2015) has also proved very useful, both for its analysis of the key features of digital comic formats and its discussion of different methodological approaches to their study.

Conclusion

The study of the form of comics is part of the relatively new and growing field of comic studies. The English-language scholarship that exists around the study of the form can trace its beginnings to the work of a small number of influential practitioner-theorists. Early comics scholars built on this foundation, aided by an influx in translation of the key French-language writing on the form. In recent years the field of comics studies has widened and diversified, resulting in a growing study of the form amongst English-language scholars. As theoretical thinking around the form of comics has grown and evolved, debate concerning the definition of comics and the identification of the most essential characteristics of the form has been a recurring theme.

Some scholars point towards the hybrid nature of comics as a blend of word and images as the defining characteristic of the form (Harvey 2001; Smolderen 2014). Others point towards sequentiality and the simultaneous juxtaposition of images as the most important characteristics of form (Eisner 2003; McCloud 1993; Groensteen 2007). Proponents of this latter view cite the existence of comics that tell purely image-based stories without the use of any words (McCloud 1993, 8; Groensteen 2007, 14). This view of the form leads towards areas of study that focus on the spatial aspects of comics such as page layout (Lefèvre 2009; Witek 2009) and the network of relations that exist between panels (Groensteen 2007; Hatfield 2009, 139-144; Miodrag 2013). Proponents of comics as a blend of word and image note that this spatial focus on juxtaposition excludes many examples of single panel comics from consideration as part of the form (Harvey 2001, 76). From the study of the blend of word and image comes further examination of how words and images interact in comics (Hatfield 2009, 133-134; Miodrag 2013, 66-69; Baetens and Lefèvre 2014) and analysis of the use of common devices such as word balloons and caption boxes (Lacassin 2014, 39-40; Cohn 2013, 35-37).

Moving beyond this central debate, some scholars question the value of formalist approaches to defining comics (Meskin 2007) and instead propose the use of sociological and institutional definitions (Beaty 2012). Another common area of study focuses on the nature of comic artwork. Chiefly this has been discussed in terms of the traditional acts of drawing that has led to the artwork's creation (Baetens 2001; Groensteen 2007, 161; Cohn 2013, 24-34). The study of digital comics has also brought to the fore debates around the representation of fictional time within the form (McCloud 2000a; Cohn 2010; Miodrag 2013). The potential for digital comics to include time-based elements such as animation and audible sound has foregrounded the importance of the reader's control over the rate at which they progress through a comic (Barber 2002). Comparisons between digital and print comics has also raised issues connecting with the materiality of comics (Priego 2010; Groensteen 2013, 66; Hague 2014), introducing concepts such as flippy-

throughiness that are impacted by the digital mediation of the form (Nichols 2016, 97; Gazzard and Goodbrey 2014).

The process of digital mediation has resulted in the emergence of new formats of comic, such as webcomic, infinite canvas, malleable page, motion comic, hypercomic, game comic and audible comic. To understand and analyse the operation of these new formats, an informed outreach towards areas of media and games theory is necessary. Through this outreach we can consider digital comics in terms of their relative immediacy or hypermediacy (Bolter and Grusin 1999) and examine the implications of the multicursal structure common to some formats (Nelson 1974; Aarseth 1997; Landow 1997; Murray 1997; Peacock 2005; Thon 2014). In hybrid formats, the study of relevant videogame theory can enable us to examine how the spatial characteristics of comics might interact with the use and exploration of space in videogames (Juul 2005; Montfort 2005; Nitsche 2008; Gazzard 2011). Similarly, the study of sound in videogames (Nitsche 2008, 129-144) and film (Chion 1994) can help to extend existing analyses of the interaction between the form of comics and integrated elements of audible sound (Hague 2014, 68-81).

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3. Characteristics of the Form

The form of comics has developed primarily within the bounds of the printed page, where it exists today in a variety of different formats ranging from serialised newspaper strips and comic books to longer collected editions and graphic novels. Rather than one all-encompassing comics industry, these formats are the product of an overlapping group of smaller industries, each with their own traditions, audiences and economics. As a result of these complex and multiple origins, "comics" can be a confusing subject topic to discuss. As Cohn notes, associated with the term are ideas about 'the industry that produces comics, the community that embraces them, the content which they represent, and the avenues in which they appear' (2005, 236).

The main focus of my study as set out in my methodology is the form of comics, separate from notions of industry, community, content or format. The study of these formal qualities is a relatively young discipline whose foundation and growth were examined in detail in the previous chapter. While owing its beginnings to a small number of influential practitioner-theorists (Eisner 2003; McCloud 1993), comics scholarship is now a burgeoning field of academic study. However as Priego notes, 'for comics scholarship the term "comics" is both unclear and contested' (2010, 47). During the development of the field, attempts to define comics and distinguish form from format have often proved contentious. Groensteen provides a useful summary of some of the problematic factors in play:

> The rediscovery of comics from the 19th century, whose formats and formulas differ from modern comics, and the flood of comics imported from Asia, which follow different cultural codes, have made defining comics all the more complicated. Finally, recent years have seen the rise of a new standard in western production, the graphic novel. All these factors have contributed to making the "definition" of comics more problematic than ever (Groensteen 2012, 113).

Within this context, definitions that include or exclude specific formats have provoked strong reaction from differently invested sections of the community. Groensteen highlights ‘how difficult it is to come up with a definition of comics that everybody agrees with’ (ibid) while Cohn describes the subject as ‘perhaps the most befuddling and widely debated point in comics scholarship' (2005, 236). Meskin highlights the ‘unsatisfactory’ nature of existing formal definitions, believing that their ‘biggest flaw is their failure to attend to the historical specificity of the medium’ (2007, 376). He calls into question whether the act of defining comics is in itself useful, asserting that definition ‘looks unnecessary to proper evaluation and interpretation’ (ibid).

Hague argues against Meskin’s view, observing that in ‘defining a comic, the definer specifies the boundaries of the object of study and thereby indicates the ways in which it is possible for her/him to interact with that object’ (2014, 12). Hague goes on to adopt a social approach to defining comics, stating that ‘a comic is what is produced or consumed as a comic.’ (27) He notes the similarity of his approach to that of Beaty, who defines comics as ‘objects recognized by the comics world as comics’ (2012, 37). Beaty asserts that this institutional definition allows for comics to be ‘better understood through the collective activities that constitute their production and circulation’ (ibid).

While such social and institutional definitions are useful in some areas of comics scholarship, they are less helpful to my own study and its aim of understanding how the key characteristics of the form are impacted by digital mediality. Priego asserts the importance of identifying these formal characteristics (2010, 74) and states that the study of digital comic depends on ‘an agreed understanding of what the phenomenon of comics is’ (52). To fully study the impact of digital mediality, it is necessary to first separate form from format and identify the key characteristics by which the form functions.

Through my analysis of the work of the theorists and practitioner-theorists identified in the previous chapter, I have sought to counter the lack of a practical

formal definition of comics by identifying a set of key characteristics of the form. Although areas of overlap exist between these characteristics, each is intended to provide a useful lens through which to examine a distinct aspect of the way comics operate when read. It is this set of characteristics of the way comics operate when read that constitute the form of comics. Expressions of these formal characteristics in different configurations, platforms and media constitute different formats of comic. Rather than attempting to seek 'specificity' (Bouyer 2014, 87) by identifying the single most prominent and defining characteristic of the form, this model acknowledges that different examples and formats of comic may place greater or lesser emphasis on each characteristic.

This approach aims to prevent a narrow definition that could risk excluding 'the more minority, atypical or experimental works' from study (Groensteen 2014b, 97). It also helps to avoid previous debates over 'an apparently endless profusion of disputed boundary cases and contradictory counterexamples' (Witek 2009, 149). Instead it will allow debated formats to be examined as comics despite the absence of certain key characteristics. The resultant model that I will present during this chapter is based on seven key characteristics of the form:

1. Space as time
2. Simultaneous juxtaposition of images
3. Closure between images
4. Spatial networks
5. Reader control of pacing
6. Tablodic images
7. Word and image blending

These seven characteristics are not intended as an exhaustive list, but rather to provide a way for the form of comics to be described and therefore discussed. While the operations of these characteristics are often tightly interconnected, this conceptual division of the form serves as a useful analytic aid to discussion.

Priego asserts that when comics exist 'on a different platform other than print, definitions of comics have to be readdressed' (2010, 342). Groensteen similarly states that digital mediation 'is likely to overturn the very definition' of the form (2014b, 100). Although primarily developed in print, these seven characteristics must accordingly be considered within the context of the last thirty years of digital mediation of the form. Digital mediality will be touched on where relevant during this chapter and examined in more detail during the subsequent chapters of this thesis.

Space as time

The form of comics is primarily spatially based and uses arrangements of panels in space to communicate the passage of time within a narrative. Priego asserts that this 'asynchronous' relationship to the passage of time in the real world is an 'essential' characteristic of the form (2010, 238). Groensteen outlines a basic difference between comics and other visual media in this regard, stating that every panel in a comic:

> is incarnated and is displayed in space. The fixed image, contrary to the moving image of cinema […] only exists in a single dimension. Comics panels, situated relationally, are, necessarily, placed in relation to space and operate on a share of space (2007, 21).

In contrast to comics, the moving image of cinema, whether film or animation, is primarily a time-based form. The sequences of images that make up a film are played one after another at speeds fast enough to create the illusion of movement. In comics, sequences of images remain static in time and are instead placed in a spatial relationship to each other. The basis of the relationship between space and time in comics is summed up by McCloud who asserts that 'space does for comics what time does for film' (1993, 7). Within a spatial arrangement of panels, both Groensteen (2014a, 67) and McCloud (1993, 94-97) assert that it is the events

depicted inside the panels that primarily dictate the flow of time within the narrative (94-97). Although in later seeking to capture the essence of comics, McCloud suggests thinking of the form as 'an artist's map of time itself' (2000, 206). This idea of comics as a 'temporal map' (207) is an important aspect of McCloud's early thinking on how the form might adapt to the mediality of the computer screen. The repercussions of this concept on various digital comic formats are explored in Chapters Four and Six of this thesis. However, as a description of the way the passage of time is represented in comics, the temporal map is an idea that has come under some criticism from later scholars.

Cohn views the temporal map as meaning 'not "physical space = fictive time" but rather "physical space = physical reading motion = fictive time"' (2010, 132). This addresses some issues with the concept, such as the way word balloons and textual sound effects distort and shift the relationship between space and time. A panel does not necessarily represent a single moment in time but rather it is our progress through a sequence of panels or moments within a panel from which our sense of time in the comic is constructed. In terms of how this construction process takes place, Cohn believes that rather than operating in a temporal map, the role of panels is to 'direct attention to depictions of "event states" from which a sense of "time" is derived' (134).

Miodrag further challenges the concept of the temporal map, noting that 'it aptly describes certain kinds of transition – and very common ones – but it certainly does not define' the form of comics as a whole (2013, 140). She instead proposes that 'the sequential arrangement of panels pertains to narrative effect, particularly reading time, and not necessarily, or even predominantly, to elapsing story time' (2013, 121). Rather than physical reading motion equating to fictive time, it is the content of a panel 'that indicates story time elapsing, with the layout of panels lending narrative pace and showcasing action, rather than telling the reader how much diegetic time elapses' (124). While arrangements in space to represent the passage of fictive time can be seen as a key characteristic of the form, it is therefore

important to stress the lack of a simple, fixed relationship between spatial positioning and the rate of time's progression.

Simultaneous juxtaposition of images

The simultaneous juxtaposition of images is a key characteristic of the form that is common to many formats of comic. In *Understanding Comics*, McCloud defines comics as 'juxtaposed pictorial and other images in deliberate sequence' (1993, 9). The concept of juxtaposition in this definition serves to differentiate the sequences of images found in comics from those found in animation. McCloud asserts that the difference between animation and comics is that 'animation is sequential in time but not spatially juxtaposed as comics are' (7). The influence of McCloud's definition can be seen in Priego's thesis, which identifies the 'juxtaposition of sequential images' as a defining quality of the form (2010, 76). Like McCloud, Priego also identifies juxtaposition as an 'essential' difference between comics and animation (239).

The concept of juxtaposition is a common theme in several definitions of the form, although the exact language in which the idea is expressed can vary. Miller observes that comics make 'meaning out of images which are in a sequential relationship, and which co-exist with each other spatially' (2007, 75). Groensteen also references the coexistence of images in his concept of 'iconic solidarity' (2007, 18). He defines this 'central element of comics' as:

> 'interdependent images that, participating in a series, present the double characteristic of being separated… …and which are plastically and semantically over-determined by the fact of their coexistence in praesentia' (ibid).

Groensteen later draws parallels between iconic solidarity and McCloud's concept of juxtaposition. He observes that the two ideas are similar because both rely on a

'coexistence' of images, in which the reader 'can see several images sharing the same space… [and] …relations between these images are displayed' (2012, 113). Miodrag similarly identifies 'the simultaneity of sequential panels on a two-dimensional plane' (2013, 140) as a key characteristic of the form. Simultaneity is a useful term in this context, highlighting that juxtaposed images can be viewed simultaneously by the reader. Like McCloud and Priego, Miodrag draws attention to this characteristic as 'a genuine point of distinction between comics and other narrative media' (114-115) such as film and animation.

Although it provides a common thread to many definitions of the form, the characteristic of simultaneous juxtaposition can be problematic when considering some formats of comic. Harvey takes issue with McCloud's use of juxtaposition in his definition of comics as this excludes single-panel, non-juxtaposed formats such as the political and gag cartoons commonly found in newspapers and magazines (2001, 76). The simultaneous juxtaposition of images is also absent when reading certain formats of digital comic that make use of a 'guided view' approach to display comic pages one panel at a time (Iconology Inc. 2013). While animated transitions between panels may still suggest the spatial juxtaposition of images, the simultaneity of the sequence of panels is no longer as readily apparent. Groensteen cautions that this can result in 'deterritorialized' panels that lack 'the linking threads woven across the surface of a page' (2013, 67). The impact of digital mediation on the characteristic of simultaneous juxtaposition is explored in further detail in Chapter Four of this thesis.

Closure between images

Miodrag asserts that 'time in comics is fictive time' (2013, 118). It is a construction by the reader based on their interpretation of the artwork, panels, words and other symbols laid out by the comic's creator. This process of construction can be usefully summed up under McCloud's use of the term 'closure.' (1993, 63). McCloud identifies closure as 'the agent of change, time and motion' in comics (65),

observing that comic panels 'fracture both time and space, offering a jagged, staccato rhythm of unconnected moments. But closure allows us to connect these moments and mentally construct a continuous, unified reality' (67).

The role that the reader plays in 'observing the parts but perceiving the whole' (63) is central to the participatory nature of comics, with McCloud further asserting that 'in a very real sense, comics is closure' (67). However, closure is not unique to comics and wider connections can be drawn to gestalt theories of visual perception from which the term closure is borrowed (Hatfield 2009, 135). McCloud notes the presence of closure at work in photography, cinema, television and various interactions from everyday life (63-65). Miodrag similarly draws comparisons between the process and 'the way we mentally group broken lines and proximate forms into continuous gestalts, and […] with the way we suture cinematic cuts, understanding fractured film scenes as whole narratives' (2013, 108).

Similar ideas to the concept of closure can be also be seen at work in aspects of Groensteen's iconic solidarity. He notes that the 'discontinuity that is the basis of the language of comics forces the reader to make inferences in order to interpret each new image appropriately' (2013, 36). Groensteen observes that as a comic reader, in order to determine 'whatever is supposed to have taken place between the proceeding image and the one we are reading' we must 'spontaneously' convert the space between panels 'into a temporal interval' (37). The role of the reader in mentally filling in the gaps between panels is clearly an important aspect of the form. However, the exact nature of how this process operates is still somewhat elusive.

McCloud examines closure in terms of the transitions that can occur between panels, noting that different types of transition can require differing amounts of work on behalf of the reader in the construction of meaning (1993, 70-72). Cohn attempts to unpick the process of closure and analyse how readers derive meaning through interpreting all the panels in a given narrative sequence (2013, 67-89). Groensteen examines and classifies the difference between which elements are

shown, intervened or signified within a given sequence (2013, 36-41). Hatfield approaches the subject from a different perspective, drawing an interesting link between closure and the comic artist's process of "breaking down" a page. He observes that:

> In fact "breakdown" and "closure" are complementary terms […] the author's task is to evoke an imagined sequence by creating a visual series (breakdown), whereas the reader's task is to translate a given series into a narrative sequence by achieving closure (2009, 135).

Eisner similarly stresses the role of the artist in arranging 'the sequence of events (pictures) so as to bridge gaps in action' (2003, 38). He states that if the artist is successful in this, then the reader should be able to 'fill in the intervening events from [their own] experiences' (ibid). Hatfield identifies the role of the reader as being crucial, noting that it in comics closure requires 'the invocation of learned competencies; the relationship between pictures are a matter of convention, not inherent connectedness' (2009, 135).

The different attempts made at analysing the nature and operation of closure in comics reveal some of the complexity inherent in the process. However, establishing the precise nature of its operation remains outside the primary focus of this study. For the purpose of the model proposed in this chapter, the term serves as a useful descriptor for the process by which the reader derives time, meaning and motion out of static, juxtaposed images. In this respect, closure can be said to operate as a key characteristic of the form of comics.

Spatial networks

While comics are often described as consisting of sequences of images (Sabin 1993, 5; Miller 2007, 75; Priego 2010, 76), these sequences can be better understood in terms of the larger spatial network of which they form part. Eisner's description of

comics as a type of 'sequential art' (2003, 5) foregrounds the importance of sequence to the form. The influence of Eisner is acknowledged by McCloud (1993, 7), who places a similar emphasis on sequence in his own definition (9). Rather than focus primarily on sequence, Groensteen takes a more holistic view of the form, arguing that the organising principle of comics is 'not that of the strip, nor that of the chain, but that of the network' (2007, 146). He asserts that panels operate not just in terms of their position in a narrative sequence but also 'in a dechronologized mode, that of the collection, of the panoptical spread and of coexistence, considering the possibility of translinear relations and plurivectoral courses' (147).

This network of connections exists not only between panels viewed in simultaneous juxtaposition, but across all the panels and pages in a multipage narrative. While linear sequences of panels present the usual progression of narrative and fictional time within a comic, the reader is always free to stray from this sequence and view the arrangement of panels in the comic in an atemporal or dechronologized mode. In observing the spread of panels outside of the usual flow of narrative, new relationships between their content and spatial characteristics may become apparent. Miodrag supports Groensteen's position and argues in favour of viewing comics as 'a network of connections rather than privileging linear sequential progression' (2013, 128). She asserts that 'panels can participate in webs of interrelationship that violate narrative sequence, and it is these non-linear relations that truly distinguish comics from other forms of narrative sequence' (2013, 111).

Groensteen describes the process of 'plurivectoral narration' in which the reader absorbs the content of individual panels in a sequence while at the same time being aware of the spatial network of which these panels form a part (2007, 108). Hatfield identifies a tension at work in this process that 'lies at the heart of comics design' (2009, 140). He asserts that in the pages of a comic there is a 'tug of war' between panels operating in sequence and as 'a graphic element in an atemporal design' (139). He observes that many comics encourage 'a near-simultaneous apprehension of the single image as both momentum-sequence and design element… [the page]

…functions both as sequence and as object, to be seen and read in both linear and nonlinear, holistic fashion' (139-40).

This tension brings to the fore the fact that spatial arrangement in comics serves as more than just a method for the establishment of fictional time. Miodrag asserts that space 'can also be used for dramatic and aesthetic ends: emphasizing action, dramatizing a spectacle, or assisting in creating a certain mood' (2013, 140). Witek notes that 'panels on the page always create narrative meaning both as sequence and as spatial arrangements' (2009, 153). Witek asserts that this quality of the spatial network is implicit in all comic formats (ibid). It is however important to note that the role of the spatial network is greatly diminished in some popular formats of digital comic that favour the display of individual panels over whole page arrangements. Conversely, digital comics built around the principle of the 'infinite canvas' (McCloud 2000, 222) can be seen to embrace and extend the role of the spatial network as a key characteristic of the form. The impact on spatial networks of these different approaches to digital mediation will be explored in detail in Chapter Four of this thesis.

Reader control of pacing

Priego observes that existing definitions of comics are often 'constrained' by having 'taken for granted comic books' printed format' (2010, 23). The reader's control over the pacing of a comic is a characteristic of the form that has perhaps been overlooked in print, but becomes more significant in the context of digital mediation. Comparisons between comics and film have similarly taken on a new significance in this context. While discussing the difference between storytelling in the two forms, film director and comic creator Guillermo del Toro observes the following:

> Who controls the pace in a comicbook page? […] Ultimately how fast a reader turns a page, how he goes back and forth between pieces in the

> layout is completely controlled by the reader. We can assume he goes left to right, we can assume he goes up to down but ultimately he's in charge (Levine and Murdoch 2011).

The line between comics and film has become increasingly blurred by the migration of comics to digital display. Miodrag notes that in film, the moving image controls 'the pace at which work is consumed absolutely, while comics' static printed images must use other means to guide and influence' the reader's control of pacing (2013, 111-112). However in a digital comic images are neither printed, nor necessarily static. Instead it is possible to directly incorporate time-based tropes such as animation and audible sound into the form. This change in mediality places an increased emphasis on the nature of the reader's relationship to the form of comics. Digital comic pioneer John Barber asserts that when reading, 'the reader controls the rate at which information is absorbed. This is inherent in comics; this is what separates comics from film' (2002).

The importance of the reader and the act of reading is further emphasised by comic creators Waid and Bigerel. Waid asserts that 'what makes comic, comics' is that, like in other forms of reading, the reader 'is in control of the pace at which… [they] …absorb the story' (O'Reilly Media 2013). Bigerel stresses the importance of placing control over the creation of fictional time 'in the reader's hands' (2009). In his digital comics manifesto he cautions that the over-use of animated elements in the delivery of a comic can result in the reader being forced into becoming an observer of the animation rather than a reader of the comic. Waid similarly states that the addition of such time-based elements risk changing comics into a form of 'cheap animation' (O'Reilly Media 2013).

Bigerel suggests that the key to making a digital comic operate as a comic is to make sure that it is always the reader who 'clicks to see what's next, with no fancy gimmicks coming from the temporal world to ruin the experience' (2009). Priego asserts that comics are a form intended 'to be read' and that while a comic's spatial arrangement may suggest the 'tempo' of that reading, the pace of reading is

ultimately 'decided by the reader' (2010, 239). He observes that in a digital comic, reader interactions like clicking to progress are 'essential for the narrative flow, in the same way that the reader needs to flip pages when reading a printed document' (311). The nature of these reader interactions in comics and the impact of digital mediation are explored in detail in Chapter Four of this thesis.

To summarise, as del Toro makes clear, the reader of a printed comic controls the pace of the story via their own pace of reading. They interrogate the spatial network of the comic, looking at panels both in and out of sequence and turning pages to progress further through the narrative. In a digitally mediated comic, for that comic to still operate like a comic, the rate at which information is absorbed must still be set by the reader. Just as in a print comic, this is determined by a combination of reading pace and the digital equivalent of the page turn, whether that be a click, a scroll or a swipe. In this way the key characteristic of reader control is maintained in both print and digital comic formats.

Tablodic images

Comics are a visual form and the artwork contained within each comic panel is a prominent aspect of this visual nature. Although both Eisner (2003, 5) and McCloud (1993, 8) acknowledge this in their definitions of the form, identifying a unified characteristic of the artwork found in comics is a more difficult proposition. Cohn examines the systematic use of common illustrative elements within comics, but these 'graphic schema' (2013, 26) are typically tied to specifics of genre, culture, tradition or production process. As such, it is difficult to say something meaningful on the subject without also being unnecessarily exclusionary. Groensteen attempts to define 'narrative drawing' (2007, 161) but the specifics of this definition find too heavily in the favour of traditional cartooning and doesn't fit as well for fumetti (photographic comics), more abstracted or digitally-derived styles.

Groensteen also calls attention to the French-language work of Philippe Marion and his theory of 'graphiation' (2013, 117). The first in-depth, English-language analysis of Marion's work is provided by Baetens, who gives a definition of graphiation as 'the graphic and narrative enunciation of the comics' and then in expanding on this definition, states that graphiation exists in:

> the aspects of the image where one can read and discover something of the idiosyncratic gesture which produced the drawing. Every drawing bears the traces of "graphiation," or the specific enunciative act uttered by the author or agent when he or she makes the drawings and does the lettering of the panels (2001, 147).

Marion's focus on 'the trace left in the drawings by the artist' (Groensteen 2013, 118) could be seen to align to aspects of Cohn's more systematic graphic schema and as such suffers from the same limiting factors outlined above. Like Groensteen's narrative drawing, the focus in graphiation on the act of drawing excludes fumetti and other illustrative practices that preference digital image creation over traditional drawing techniques. However, the idea of linking the creation of comic artwork to the conveyance of narrative is significant and provides a useful thread towards a unifying aspect of comic artwork.

A different approach to the subject is provided by Miodrag, who highlights the similarity between the composition and framing of the art in comics and the shots in a film (2013, 212). Terminology that originates in film making is commonly used in comics, such as the use of 'establishing shot' to describe the contents of a panel that establishes a scene's location (McCloud 2006, 22; Delwiche 2015). Mutard makes a connection between the 'basic visual storytelling' of comics and film, observing that both give priority to showing an event over its written or verbal description (2013, 285). He describes comics as consisting of 'narrative images' that when read in juxtaposition 'invoke the illusion of occurrence' (285). Miodrag, in observing the key differences between comics and film, notes that the static nature of comics 'yields narratives broken down into a staggered chain of key

representations, experienced differently to film's mimetic flow of action' (2013, 212).

The concept of comic panels as 'key representations' is particularly useful when combined with the idea of illustration focussed on the conveyance of narrative. To draw these threads together into a single definition, we can say that the artwork in a comic is something deliberately composed, framed and illustrated to represent key moments of narrative meaning. A useful term to contain these ideas can be found in the concept of the tableau that is commonly used in photography and the theatre. Returning to Marion's concept of graphiation, we can identify the trace of the artist as existing in the composition, framing and illustration of these tableaux. Comics can accordingly be described as consisting of "images with the quality of the tableau" or "tablodic" images.

Word and image blending

The importance of words to the form of comics is a subject of some debate. Eisner describes comics as a form with an 'image-word mix' (2003 ,7). He states that comic books feature both an 'interplay' and 'montage' of word and image (8), but also notes the possibility of telling wordless stories that rely on images alone (16). In his own definition of the form focussed on sequence and juxtaposition, McCloud asserts that comics don't 'have to contain words to be comics' (1993, 8). Groensteen discusses the interaction of word and image within his broader concept of arthrology (2007, 127-134) but asserts that comics do not necessarily have to include words in order to operate as comics. He identifies several examples of 'silent comics' (2014b, 107) that are 'devoid of verbal enunciations, without dialogue or the narrational text (captions)' (2007, 14).

Despite the existence of such examples, the majority of comics do incorporate words via the use of common tropes such as speech balloons, thought bubbles, captions and written sound effects (Cohn 2013, 36; Baetens and Lefèvre 2014, 184;

Lacassin 2014, 39). Harvey asserts the importance of words to the images in comics, stating that together the two 'achieve a meaning that neither conveys alone without the other'' (2001, 75-76). In direct criticism of McCloud's sequence-focused definition of comics, he identifies word and image blending as 'the essential characteristic of "comics" – the thing that distinguishes it from other kinds of pictorial narratives' (75). Hatfield acknowledges the existence of wordless comics (2009, 133) but still identifies the interplay of word and image as one of the 'fundamental tensions' at work in the form of comics (132). He states that by not considering 'verbal/visual interplay crucial to the form, [McCloud] neglects just how much the interaction of images and words can inform, indeed enable; the reading of sequences' (137-138).

In his later writing, Groensteen cites this observation by Hatfield in asserting that 'the viewpoints championed respectively by McCloud and Harvey seem […] complementary' rather than antagonistic (2014b, 107). Cohn asserts the importance of words to the form, noting that 'visual language most often occurs in conjunction with written language in the creation of meaning' (2013, 13). Smolderen similarly views the form of comics as a hybrid of word and image that operates as 'an audiovisual stage on paper' (2014, 47). Miodrag states that 'it is indisputable that words and images interact in producing comics narratives' (2013, 83). While providing a useful analysis of the diverse range of text-image interactions found in the form (83-107), she is careful to highlight the complexity and variety of these interrelationships, observing that 'though the mutual exchange between the visual and verbal is pertinent to any examination of comics, the nature of that exchange cannot be defined for the form as a whole' (89).

Despite minimising the definitional importance of words, even McCloud later asserts that comics operate best when words and pictures work in tandem, taking turns to lead 'and support each other's strengths' (1993, 156). Due to the inclusive nature of the model proposed in this chapter, such contradictions are less problematic than they might initially appear. The blend of word and image can be seen as a key characteristic that operates in complement with the simultaneous

juxtaposition of images, but that is occasionally absent in some examples of the form.

Miller points the way towards this compromise, including in her definition of comics the qualifier that sequences in comics may operate 'with or without text' (Miller 2007, 75). Sabin similarly defines the form as operating 'usually, but not always, with text' (1993, 5) while Priego asserts that comics 'optionally but frequently' incorporate words into their narrative (2010, 76). As these flexible and inclusive definitions show, it is possible to acknowledge the essential "comicness" of wordless comics while at the same time recognising the prevalence of word and image blending within the form. In the same way that film can operate as a silent form and yet is usually enhanced by the addition of a soundtrack, the blend of word and image remains a powerful and key characteristic of the form of comics.

Conclusion

This chapter has established a model for the operation of the form of comics based on seven key characteristics. This model identifies comics as a form which uses arrangements of panels in space to communicate the passage of time within a narrative. These panels are arranged in simultaneous juxtaposition, forming spatial networks that contain linear narrative sequences and foster other less linear narrative and aesthetic interrelations. As the reader progresses through this spatial network, they control the pace of their own reading. The passage of time and motion displayed in the panels within the network is constructed by the reader through the process of closure. The images displayed are tablodic in nature, and often operate in a hybrid blend with written words.

Taken together, these characteristics could potentially be used as indicators of the relative "comicness" of a specific media artefact. However, the purpose of this model is not to reach a rigid definition of the form. Instead it aims to enable an examination of the impact of different kinds of mediation and hybridisation on the

form of comics. As such the model allows for the study of comic formats that do not demonstrate all of the seven characteristics identified in this chapter. It also allows for different examples of the form to display greater or lesser emphasis on each characteristic.

For example, in a typical comic book or graphic novel, all seven key characteristics of the form can be observed in operation. However in 'mute' (Groensteen 2007, 14) or 'pantomime' (Hatfield 2009, 133) comic books and graphic novels that feature no written words, the form of comics can be seen to operate without the characteristic of word and image blending. In most comic strip formats all seven characteristics are again on display, although the role of the spatial network may be more limited in its expression. In single panel newspaper cartoons, only the characteristics of reader control, tablodic images and word and image blending may be observed in operation.

The chapter has also considered some aspects of the impact of digital mediation on the key characteristics of the form. The incorporation of animation and sound into digital comic formats can present challenges to the reader's control of pacing and the establishment of fictional time through the spatial arrangement of panels. Digital comics that either operate a guided view or use similar techniques that focus on displaying panels one at a time can limit or eliminate the use of simultaneous juxtaposition and the spatial network. Conversely, digital comics that follow an infinite canvas format can strengthen and extend the characteristic of the spatial network. A more detailed examination of the impact of digital mediation on the form of comics will be provided in the subsequent chapters of this thesis.

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4. Digital Mediality

The form of comics is undergoing a transition, as digital display becomes an increasingly popular mode of consumption. This is a transition that has been underway since before the general adoption of the World Wide Web and recent developments in portable display devices have advanced the pace of this change. Smart phones and tablet computers have been widely adopted, providing platforms that support a wide range of visual, narrative and interactive forms. Rather than print, many people now use these digital devices as their primary "reading" media. As comics gradually leave behind the trappings of print and embrace those of the screen, it becomes necessary to re-examine the fundamental storytelling practices of the form in the context of these changes.

This chapter examines the impact of the transition from print to digital display on the key characteristics of the form of comics that were identified in Chapter Three. In addition to comics theory, the chapter draws ideas from scholarship concerning digital media. It applies these theories in an examination of some of the new formats of comic that have resulted from the digital remediation of the form. In this manner the chapter provides a critically grounded exploration and analysis of how the key characteristics of the form have been impacted by the range of new storytelling tropes emerging amongst digitally mediated comics.

The rise of digital display

Over the course of the last thirty years, the widespread adoption of the computer and digital display has opened comics to new avenues of creation, distribution and consumption. Groensteen notes that computers have 'become omnipresent in comics production' (2013, 64) and that in the creation of modern comics, 'a scanner, and software for graphic design and coloring are now standard equipment for most artists' (ibid). Priego similarly observes that these new tools have

'complemented and augmented' the traditional artistic processes of comic creation (210, 222).

Initially however, the comic form's colonisation of the digital domain came via the world of videogames, with the appearance of early hybrids such as the hypercomic adventure game *Redhawk* (Silhouette Software 1986) (see Chapters Five and Six). At the time these comics were still, as McCloud notes in his seminal *Understanding Comics*, 'the territory of games and strange little experiments' (1993, 106). But by the year of *Understanding Comics'* publication, a more profound change was already underway. The addition of inline image display to the *Mosaic* web browser in 1993 contributed to a massive surge in popularity for the World Wide Web, with web use growing by a factor of 341,634% (Campbell 2006, 15). It also led to the emergence of the first webcomics; comics created specifically for digital display and distribution via the web (17).

As the web grew in popularity through the 1990s, the webcomics scene expanded and matured, bolstered by a rapidly expanding community of new readers and creators. The web offered creators an opportunity to reach a widening audience of readers without incurring the prohibitive production costs of publication and distribution associated with print (ibid). By the early 2000s a dominant model for webcomics had begun to emerge, based around regularly updated, creator-owned serials. These were typically presented as horizontal strips of three to four panels, similar in format to that of daily newspaper comic strips. While these webcomics were presented to readers free of charge, creators of popular series were able to generate income via advertising and merchandising (Johnston 2015, 5).

Today, digital distribution and display is an increasingly popular mode of consumption for the form of comics. Portable touchscreen devices such as smart phones and tablet computers have provided a single platform of consumption for comics, film, animation and videogames. Traditional print comic publishers had been wary of making the leap to the web and were reluctant to adopt the "free content" business model established by creator-owned webcomics. But the

prevalence of touchscreen devices and an increased acceptance of paying for digital content has led to a significantly different publishing landscape. As a result, the larger comic book publishers have moved to embrace digital formats, both as an avenue for additional income and as an outreach to new audiences (Smith 2013, 19). *Comixology* is a popular digital comics distributor used by several of the major US comics publishers. This service offers 'a cloud-based digital comics platform… [for] discovering, buying, and reading comics' (Iconology Inc 2013) on tablets, smartphones and personal computers.

However, in terms of the key characteristics of the form, many digital comics do not operate significantly differently from their print forbearers. An explanation for this can be found in Bolter and Grusin's concept of remediation, which they define as 'the representation of one medium in another' (2000, 45). In the case of webcomics that follow the format of the newspaper strip or the *Comixology* versions of monthly comic books, the computer screen serves primarily as a new means of accessing a pre-existing format. Bolter and Grusin note that it is as if:

> the content of the older media could simply be poured into the new one. Since the electronic version justifies itself by granting access to the other media, it wants to be transparent… …so that the viewer stands in the same relationship to the content as she would if she were confronting the original medium (ibid).

Accordingly, in most of today's digital comics, the key characteristics of the form remain largely unchanged. Already a good fit for the dimensions of the computer screen, the format common to newspaper comic strips has been adopted by webcomics without any real change to its spatial layout. At this structural level, the relationships between panels in 'printed comics and webcomics are not essentially different' (Priego 2010, 113). In terms of digital comics intended for reading on tablets, the business models of the larger US comic publishers are still built chiefly around selling printed products via speciality comic shops and book stores. As a result, the digital comics offered by companies like *Comixology* are a

straightforward digital remediation of comics originally designed for the printed page.

A typical printed comic book can be displayed one page at a time on a computer screen, with a mouse click replacing the traditional page turn. In print comics that receive their initial distribution via the web, some creators willing to embrace the dimensions of the computer screen may opt to use landscape rather than portrait page dimensions. Although with tablet computers now offering an easily rotatable reading platform, this is becoming more of an aesthetic choice than an issue of readability. Smith asserts the suitability of tablet computers for comic reading, noting that their physical dimensions 'demonstrate a clear correlation to the traditional comic book portrait format' (2013, 19). The touchscreen common to tablet computers is also significant for introducing the idea of swiping the screen in order to turn the page. This gesture, with a physical motion more akin to that of the traditional page turn, can be seen as an example of increased immediacy or 'a style of visual representation whose goal is to make the viewer forget' the digital nature of the comic being consumed (Bolter and Grusin 2000, 272).

At present there are still relatively few digital comics that have been designed specifically for primary consumption via tablet computer or smartphone. There does however exist a wealth of experimental work carried out by independent creators in the field of webcomics that points towards the potential offered by these new formats. In exploring this potential such works often tend towards a state of 'hypermediacy' in which the reader is increasingly reminded of the digital nature of the medium (ibid). Ultimately, it is only when creators start to question the tropes common to print and the form pushes towards hypermediacy that we begin to see significant impact on the key characteristics of the form. For the purposes of this chapter, this impact has been broken down across three broad categories:

- Page turns versus panel delivery
- Pages versus windows
- Space versus time

Page turns versus panel delivery

One approach to the flexibility of digital space is demonstrated in panel delivery based comics. Panel delivery retains the concept of the page as a grouping of panels into a single 'design unit' (Hatfield 2009, 139) and as such draws on a wealth of already established compositional tricks and tropes. In printed comics, stories are built around the turn of the page, which allows creators to delay the delivery of punch lines and to craft moments of surprise or suspense within their narratives. Each page displays its constituent panels in simultaneous juxtaposition with each other, allowing for both linear and nonlinear readings of the comic's spatial network. The important difference with panel delivery, is that the content of each page grouping is not treated as being permanently fixed in space. One of the original pioneers of panel delivery was webcomic creator John Barber, who here outlines his approach to laying out a sequence using the technique:

> The screen will act as an unmoving stage onto which panels will appear. Initially, a single panel (or group of panels) is presented to the reader. The reader clicks on the stage and a new panel (or group of panels) appears. […] These new panels join the previous ones, often replacing or obscuring some (or all) of them (2002, 63).

The tension between page and screen inherent in this approach is highlighted by Barber, who describes the result as being 'a "malleable page", using "page" somewhat ironically as this can only occur on-screen' (ibid).

Panel delivery can be seen at work in *Insufferable* (2012-2015), an ongoing superhero webcomic written by Mark Waid and illustrated by Peter Krause. The

webcomic follows the adventures of Nocturnus and Galahad, a dysfunctional father and son superhero team who are forced to reunite after years of separation. The online nature of the series was a departure for Waid, who had built his reputation over the previous two decades writing primarily for the two major US monthly comic book publishers, Marvel and DC. Waid lays out his reasons for making the jump to a digital delivery and distribution platform, stating that he believes strongly that:

> comics can and will be a thriving mass medium in the digital age if – IF – they're created for modern media devices and not exclusively for printed pamphlets that are overpriced, uninviting to new readers, and abominably distributed in only a relative handful of storefronts nationwide (2012a).

Insufferable offers an example of remediation where the newer medium presents itself, to use Bolter and Grusin's phrase, as a 'refashioned and improved' (2000, 17) version of the original. In a traditional comic book the pace at which the reader advances through the story is fixed to the repetitive interval of the page turn. In contrast, advancement through a digital comic does not have to be tied to the same rhythm throughout the narrative.

During the majority of the first chapter of *Insufferable* (Krause and Waid 2012), the reader clicks to advance through the story one page at a time, with each page consisting of fixed arrangements of separate panels. However, during a key sequence towards the end of the narrative, there is a change in the pace of advancement. Nocturnus finds himself stuck in a pit beneath an old abandoned warehouse. As he struggles to rescue a kidnapped woman from the bottom of the pit, the building starts to collapse above him. During the rescue each click reveals only a single panel of the page at a time, so as to more slowly reveal the events being depicted. This slows our experience of time within the narrative, increasing the tension for the reader before revealing a surprise rescue by Galahad in the very last panel.

Although it originated on the web, panel delivery is also now used in some tablet-based digital comics. In an initiative led by Waid, US publisher *Marvel Comics* has begun to experiment with the process in their *Infinite Comics* imprint on *Comixology*. Unlike the majority of *Marvel* titles available via the service, digital comics like *Avengers vs. X-Men #1: Infinite* (Immonen and Waid 2012) and *Guardians of the Galaxy Infinite Comics #1* (Bendis and Oeming 2013) have been designed specifically for consumption via the screen using panel delivery. To understand the significance of this, it is important to make a clear distinction between panel delivery and the standard 'guided view' (Iconology Inc. 2013) that *Comixology* includes with the majority of the remediated print comics that it offers for download.

When following a guided view, the reader consumes each page of a comic from a zoomed viewpoint that shows one image at a time. A simple animated transition is then used to show how each image or panel relates to the next in sequence. It is a technique necessitated by the difficulty of adapting print comic pages to the smaller dimensions of smartphone screens (and similar issues between double-page spreads and tablet screens). It is unfortunately also a reductive experience, which severely limits the reader's ability to appreciate the 'dechronologized mode' (Groensteen 2007, 147) of the original print comic's spatial network. The guided view itself is created by the *Comixology* service without direct input from the creators of the original print comic. As such it offers none of the fine control over pacing, panel positioning or page composition that is available to a creator making deliberate use of panel delivery in the creation of a digitally native comic.

The panel delivery approach taken in *Insufferable* and *Infinite Comics* has been heavily influenced by the work of cartoonist Yves Bigerel and his manifesto, *About Digital Comics* (2009), which Waid cites as 'the foundation... [for his] ...entire mindset and mission' (2012b). The manifesto takes the form of a webcomic in which Bigerel demonstrates the new 'story telling possibilities, [and] new ways to create time with space' (2009) that panel delivery has to offer. Bigerel stresses the flexibility panel delivery brings to panel layouts, while noting that it still allows for

the use of traditional page composition techniques where appropriate. He suggests that by controlling how many panels are revealed each time the reader clicks to advance, the reader's perception of diegetic time can be sped up or slowed down. Controlling when panels appear and the order in which they appear can also be used to create surprises for the reader or foreshadow dramatic events (techniques that were previously only achievable in print at the turn of the page).

These processes can be seen at work in the previously discussed rescue sequence from *Insufferable*. As the reader clicks, the sequence of revealed panels builds towards a close-up of Nocturnus, his eye opened wide in panic as he tries to think of a possible escape. Once the close-up is revealed, further clicking causes the other panels to disappear, leaving this image as the sole visual element on the page and extending the protagonist's moment of panic. A further click then reveals a single word balloon with its tail leading off-page, foreshadowing the arrival of someone new to the scene. Only with a final click is the sequence completed, revealing a panel behind the speech balloon that shows a hand reaching in to offer rescue from above.

It is useful in considering the effects of panel delivery to return to Cohn's concept of time in comics. Cohn proposes that time is not necessarily created by the immediate juxtaposition of two panels, but rather by groupings of 'units of attention' (such as complete narrative actions, distinct states of action and aspects of narrative setting) that segment a 'conceptual space that is additively built throughout the sequence' (2010, 142). Much of the impact achieved through panel delivery lies in allowing creators to play games with these units of attention. The delivery of a given sequence to the screen can be more finely regulated, while existing sequences can also be modified, broken down, reused or reconfigured in service of the narrative. As shown in the example above, this increased granularity of elements can allow for new approaches to word and image blending. The arrival of panels on the screen can also be used to subvert usual compositional practice for deliberate effect.

In one sequence within *Guardians of the Galaxy Infinite Comics #1*, hostile aliens surround the story's protagonist, Drax the Destroyer. The sequence begins with a full-page establishing shot that shows Drax drinking at a bar while the first of the aliens talks to him from the right of the page. When the reader taps to advance, the following panel in the sequence then overlays the establishing shot on the left of the page, reversing the usual left-to-right reading order. Further taps bring up more panels overlaid against the original establishing shot, each depicting close-ups of more of the hostile aliens. Drax is eventually left in the middle of the establishing shot, surrounded by panels on all sides just as in the story he now finds himself surrounded by enemies.

Barber notes that panel delivery ‘defies the necessity of a left-to-right reading arrangement, as the movement of the new panel automatically draws the reader’s attention, regardless of the placement’. (2002, 65) The overall effect of such techniques is to suggest a perception of time that is far less fixed and rigid than is easily achievable in print. This plasticity of space and sequence allows for alternation, surprise and suspense to be achieved in the individual delivery of panels. However, the more such effects are relied upon, the more they weaken the use of simultaneous juxtaposition and decrease the potential for less linear readings of the spatial network.

The role of the page must also be considered within the context of multipage formats. In printed comic books and graphic novels the reader can flip either forwards or backwards through the pages and, as Hague observes, ‘the changing shape of the comic indicates the progression of the narrative’ (2014, 108). Gazzard and Goodbrey note that such print formats provide ‘a fixity to the physical location of all the information’ in the spatial network of the comic (2014). These qualities of multipage comics are summed up by Nichols under the term of ‘flippy-throughiness' (2016, 97). Digital comics, by their lack of fixed physical structure and the loss of ‘the physical handling of the book’ (Groensteen 2013, 66), erode the quality of flippy-throughiness. Gazzard and Goodbrey state that the more a comic ‘embraces the mutable nature of the screen and seeks to control the individual

display of panels' the worse the erosion of flippy-throughiness becomes (2014). They caution that as 'the reader's concept of a comic's wider spatial network becomes less manageable, this can serve to interrupt the rhythms of reading that are inherent in how we read and explore multipage comics' (ibid).

Pages versus windows

One way to approach to the erosion of flippy-throughiness in digital comics is to make use of McCloud's concept of the 'infinite canvas' (2000a, 222). In *Reinventing Comics*, McCloud proposes the idea that 'the monitor which so often acts as a page may also act as a window' (ibid) onto a much larger arrangement of panels. McCloud identifies the page as simply an artefact of print rather than an intrinsic element of the comics form. He then goes on to offer a prediction that once 'released from that box, some will take the shape of the box with them but gradually, comics creators will stretch their limbs and start to explore the design opportunities of an infinite canvas' (ibid).

In an infinite canvas comic, all the panels in the comic's network are given a fixed spatial relationship on one large plane or canvas. The window of the screen is then placed directly under the reader's control, allowing them to move around this plane in order to read and navigate the comic. As Gazzard and Goodbrey assert, this provides the reader with 'a fixed spatial configuration or shape to hold in their head and full control over their progression and place within the network' (2014). Thus, despite the diminishment of the page as a design unit, the infinite canvas best captures within a digital environment 'the spirit of how a multipage work is traditionally read, explored and flipped-through' (ibid).

To return to a quote from Groensteen in the previous chapter, it should be noted that 'comics panels, situated relationally, are, necessarily, placed in relation to space and operate on a share of space' (2007, 21). Space in the world of print comics is a finite resource and every panel in a print comic has to be allotted its

share of that resource. The space of the comic is broken down into the fixed, homogenised groupings of panels that we call pages. Stories are then often told across fixed, pre-determined and conventionalised page counts. For print comic creators, space is at a premium. They have been trained to get the most narrative impact possible out of every page and to make every panel count. While it is still possible to experiment with layouts that vary the distance between panels for deliberate effect (Lefèvre 2009, 161), such approaches operate under tight spatial limitations. However, on the screen, the space a comic occupies is no longer finite or fixed by the physical constraints of industry-standard processes and conventions.

The concept of the Infinite canvas has been taken up by many different webcomic creators since McCloud proposed the idea in 2000. With space no longer at a premium, the potential to experiment with the spatial relationship between panels becomes much more appealing to the creator. McCloud's suggestion to treat comics as a 'temporal map' (2000a, 207) encouraged creators to explore the use of space as a way to influence the reader's perception of fictional time within the comic. In McCloud's own *Zot! Online: Hearts And Minds Part 3* (2000b), the usual flow of panels in the webcomic is replaced with one long vertical panel lasting across six screens worth of scrolling. A mid-air explosion sees the story's protagonists falling through the sky with the vertical panel used to slow the experience of free fall, before the usual panel structure is abruptly resumed as the protagonists finally reach the ground.

In Drew Weing's *Pup Ponders the Heat Death Of The Universe* (2004), the webcomic's protagonist sits pondering the entire future history of the Universe. As the reader scrolls through, the comic's panels become larger and then drop away altogether as the scale of both the events and time being pondered expands out beyond the edges of the screen. The sun expands to supernova, filling the screen and consuming the earth. The stars wink out and the reader is left scrolling through screen after screen of black as the protagonist tumbles through the void, lost in thought.

Conversely in Manien Bothma and Jason Turner's *True Loves 3: Business is Brisk* (2011), we see the infinite canvas used to differentiate between small moments of everyday life. During the protagonist's wordless journey to work, individual moments from the journey are shown and plenty of white space is left between the panels to suggest they are part of a larger passage of time. Once the protagonist arrives at work and enters into conversation with a colleague, the gaps between the panels shrink to suggest a more condensed experience of relative time.

Groensteen asserts that in a printed comic, 'every panel exists, potentially if not actually, in relation with each of the others' (2007, 146). Infinite canvas comics can build on this aspect of the spatial network; once the reader is given the ability to easily zoom in and out of the canvas, it becomes possible to see the spatial relationship between every panel in a narrative. This is the "space" of comics, not just as a temporal map but as a narrative map, giving a clear visualisation or shape to an entire story. McCloud notes how this can be used to 'provide a unifying identity' (2000a, 227) to a story, with the layout directly reflecting the events or tone of the narrative.

This strategy is evident in my own *Never Shoot the Chronopath* (Goodbrey 2007), within which the shape of the whole story is shown as three lines of panels that all cross through a shared jumble of panels positioned towards the right of the screen. Zooming in to follow one of the lines reveals one of three parallel narratives that intersect during the jumble of panels. Within the jumbled intersection of the storylines there is a breakdown in the usual flow of narrative time, which is mirrored in the confused order and spacing of the panels. As the reader zooms back out to follow a different line through the story, the presence of the jumble in the overall shape of the comic remains a reminder of what's to come, creating a sense of foreboding and inevitability within the narrative. The choice of pathways on offer in *Chronopath* also signifies a shift into the medium of the hypercomic. Hypercomics can be described as comics with multicursal narrative structures. Different trails within an infinite canvas hypercomic can reveal divergent timelines,

different sequences of events, points of view or narrative outcomes. They will be examined in more detail in Chapter Five.

While the infinite canvas has remained a popular choice amongst webcomic creators, unlike panel delivery it has yet to see much adoption amongst digital comics created for smartphones and tablet computers. The hypermediacy of treating the screen as a window remains a more marked departure from notions of the traditional page. As such it does not fit well alongside the prevalent trend towards immediacy seen in the majority of comics delivered via touchscreen devices, whereby the page turns of print comics are emulated. However, as Bolter and Grusin note:

> As each medium promises to reform its predecessor by offering a more immediate or authentic experience, the promise of reform inevitably leads us to become aware of the new medium as a medium. Thus, immediacy leads to hypermediacy (2000, 19).

The more comfortable that comic readers become with the concept of tablets and smartphones as media distinct from that of the printed page, the more accepting they will be of new, screen-based tropes. During the development of this thesis, part of my own work as a practitioner has been based on exploring this potential for innovation in digital comics. In my hypercomic smartphone app *A Duck Has an Adventure* (Goodbrey 2012), the reader is given the opportunity to make key, life-changing decisions for the story's protagonist. To do this the comic makes use of a zooming infinite canvas approach. Each decision opens up a new pathway to follow, with a new trail of panels being created as the reader advances.

The more the reader explores the result of making different decisions for the protagonist, the more the story builds into a map of all the possible directions one person's life might take. Certain alternate timelines can be seen to mirror each other in their layout, leading to points of thematic and narrative crossover between the different trails. Some endings to the story can only be reached once the reader

has visited these crossovers via both of the mirrored pathways. The comic's spatial network thus becomes the site of puzzle-solving gameplay on behalf of the reader, as they attempt to find all the points of convergence in order to unlock further progress through the narrative. This will be examined in more detail in Chapter Six.

Space versus time

In Chapter Three, the form of comics was established as being spatially based in contrast to time-based forms such as film or animation. However, another result of comics' move to digital display is that it has become possible for creators to easily include animated, time-based elements as part of a comic's spatial network. In discussing the uses of animation in digital comics, we need to consider both animation of the content inside the panel and animation and movement of the panel itself.

Movement of the panel can essentially be considered as an extension of the ideas of panel delivery covered in the earlier part of the chapter. Animation in this case is used to provide a level of visual continuity to changes in the page layout. This plays into one of the characteristic pleasures Murray identified as being inherent to digital environments, 'the pleasure of transformation' (1997, 154). Murray notes that: 'Anything we see in digital format – words, numbers, images, moving pictures – becomes more plastic, more inviting of change' (ibid).

Animation of the panel provides a visualisation of this process of change. Rather than seeing simply a new spatial arrangement of panels as a result of a click, animation can be used to suggest the movement and rearrangement of the pre-existing panels as the direct result of reader interaction. Panels and sequences of panels can slide in, off or around the screen. The speed and style of panel movement can also be used to affect the meaning of the content within the panel or of the panel's relationship to other panels in a sequence. Barber describes this process as 'visual onomatopoeics' (2002, 66), illustrating the phenomena with a

simple example: ‘For instance, a panel of a character falling might drop down quickly or slowly depending on the speed at which the character falls’ (ibid).

My own *The Mr. Nile Experiment 11: Burning Your Map* (Goodbrey 2003a) is a webcomic that presents some of the applications of panel movement. The story is a metafictional narrative in which the protagonist has turned his comic into a conceptual time machine. Upon the reader’s activation of the time machine, a panel is animated to move back up the sequence of panels to the beginning of the comic, creating a divergent timeline that changes the existing sequence of panels to show new events. In a later instalment of the series, *The Mr. Nile Experiment 15: We All Fall Together* (Goodbrey 2003b), constantly moving panels that cannot be controlled by the reader are used to suggest a breakdown of the usual flow of time within the narrative. Here, the loss of the reader’s control over the animated element is used to mirror the protagonist’s own loss of control over his metafictional reality.

Animation of content inside the panel is a technique common to many webcomics. Part of the reason for the popularity of its use can be seen as a result of the ubiquity of the GIF image format on the web, which provides a straightforward way to integrate animations into a comic. Short loops of animation can be used inside a panel without disturbing the process of closure or challenging the primacy of space as time. They can be used to add atmosphere, for dramatic effect or to draw attention to specific qualities of the story world.

In one sequence from Demian 5’s wordless webcomic *When I Am King* (2001), we see animation being used in three different ways. First it is used to establish the character of a store owner, whose pretentions to rock and roll stardom are embellished in a single animated loop of the owner dancing in his darkened store. Second it adds atmosphere to the scene, with the shop owner’s boredom at his lack of customers highlighted by an animated panel of repeated foot tapping. Lastly it is used in place of the textual content in a word balloon, with an animated image of

the store owner giving a vigorous hand shake being used to suggest the eager verbal greeting given to a customer entering the store.

One of the reasons looped animation can be made to work successfully within the digital comics form is that there is already a working precedent for its existence on the printed page. Cohn draws attention to the phenomenon he defines as 'polymorphic' (2010, 131) panels. These panels 'show a single entity repeated in multiple positions of an action while remaining in a single encapsulated frame' (ibid). A simple example might be a dog chasing its own tail. The reader sees within a single panel the same dog in multiple positions as it rotates in place, trying to catch its tail. Cohn notes that these panels 'seemingly represent the duration of time, rather than a single instance where the entity would seem to be in multiple positions at the same moment' (ibid).

In the panel itself there is no clear indicator where the motion starts or stops. As such, a polymorphic panel may appear to represent a continuous movement. But resolution of the action is provided by the rest of the sequence of panels of which the panel is a constituent; the dog cannot have chased its tail forever, as we see it walking along with its owner in the next panel. In this way the process of closure resolves and incorporates the continuous action into the larger sequence of panel. In the same manner, looped animation content within a digital panel has its resolution provided by the sequence of which the panel is part, therefore maintaining the primacy of spatial arrangement as time.

The integration into panels of un-looped, fixed duration animations is a more difficult proposition. Lefèvre asserts that the reader of a comic is not 'a passive agent: he or she looks at images with prior knowledge and activates the images' (2009, 162). When exploring the spatial network of a comic the reader is in control of the comic's pacing. They activate the words and images in the network and, through the process of closure, create the fictional passage of time that exists within the narrative. Gazzard and Goodbrey describe the reader as building up 'rhythms of reading' while exploring the 'spatial-temporal relationship between the

reader's experience of time and the portrayal of time within the story world' (2014). Groensteen outlines the problem this can present for the inclusion of fixed duration animations in a digital comic:

> Comic readers generally set their own rhythm, with no constraints; as soon as they have to make allowances for the exact length of an animated image or sound, the reading process must be synchronised with these additional factors, and readers' freedom is sacrificed (2013, 70).

Groensteen also draws parallels between the active reader of a digital comic and the role of the 'user' (68) in interactive hypermedia. Gazzard and Goodbrey (2014) propose a way to examine temporal relationships in this context based on Juul's work on time in videogames. Juul proposes the idea of 'play time' (2005, 142) which Gazzard and Goodbrey equate in comics to 'the time the reader takes to navigate and read' a comic (2014). Opposed to this 'reading time' (ibid) is the 'fictional time' that occurs within the narrative itself (Juul 2004, 142).

Gazzard and Goodbrey state that the reader's control of pacing in a comic relies on 'negotiating the control of their own reading time alongside the fictional time depicted in the narrative' (2014). The short, indefinite loops of animation used within webcomics provide minimal interruption to the reader's control over their reading pace. However, digital comics which include animations of fixed duration can disrupt 'the normal rhythm of this relationship by adding what in videogame terms can be described as "cut-scenes;" moments of animation or animated transitions where control is taken away from the reader' (ibid). This can result in an unsatisfying reading experience in which the reader's sense of 'agency' (Murray 1997) within the rhythm of their reading is eroded. As Groensteen suggests (2013, 70), these issues associated with the integration of animation in digital comics also have implications for the integration of audible sound. Sound in digital comics will be examined in more detail in Chapter Seven.

While digital mediation clearly opens up new possibilities for the inclusion of animation and sound, Groensteen notes that it also 'poses the problem of the right dosage, the correct ration – with the twin hazards of overdoing it or undercooking it' (2013, 71). Ultimately it is a comic creator's own notions regarding the nature of the form which shapes the extent to which they will explore the possibilities on offer. Motion comics are one new digital format that many creators identify as having crossed the line between comics and animation. Smith describes motion comics as a type of 'hybrid animation, directly influenced by existing comic book narratives and artwork' (2013, 254). While they often use existing print comics for their raw material, motion comics remediate this artwork into a style of cut-out animation which is then further augmented via the addition of time-based soundtracks and voiceovers.

Waid makes his opinion of the format clear: 'I kind of think of motion comics as the devil's tool. […] They're many things with voiceovers and music and so forth, but they're not comics' (O'Reilly Media 2013). Such understandings regarding what features constitute the form of comics (and what features do not), ultimately establish limits on the ways in which many digital comic creators incorporate animation within their work. Waid identifies motion comics as a type of 'cheap animation' (ibid), lacking the fidelity of a traditionally animated cartoon while at the same time having lost their status as comics. Priego similarly describes motion comics as being 'closer to film, video games and video' than comics (2010, 225). Hague believes the unclear nature of the format to be one of its chief weaknesses, noting the uncertainty as to whether a motion comic 'is a comic with a lot of animation or an animation with very little' (2014, 76). But at what point does this potential transition from comic to animation occur?

Motion comics lack many of the key characteristics of the form of comics. They replace space as time with time as time, do not operate as spatial networks and lessen the reliance on closure between images. Some examples of the format go further, minimising or removing the simultaneous juxtaposition of images and replacing word and image blending with a full, voice-acted soundtrack. Smith notes

that in these more 'cinematic' motion comics, the form of comics is subsumed within a 'full-screen mise en scène' (2013, 256). Perhaps most crucial of all is the absence of the characteristic of reader control of pacing. Hague observes that:

> Motion comics are generally released in a video format […] and offer no more control than a standard film in terms of navigation of the text; the use of the term "reader" to describe the consumer of motion comics is perhaps somewhat inaccurate – "viewer" would be more appropriate (2014, 76).

A motion comic is viewed, not read. The reader has ceded all control over the pacing of the comic to the animator, who now determines the rate at which information in the motion comic can be absorbed. It is this characteristic of reader control that Waid asserts to be 'what makes comics, comics' (O'Reilly Media 2013) and it is the absence of this characteristic which places motion comics most clearly into the category of animation.

Conclusion

This chapter has analysed a variety of ways in which comic creators have made use of the narrative potential of digital display. The remediation of the form of comics has been examined, highlighting the ways in which comic creators have responded to the new tropes and opportunities offered by digital display. This has included panel delivery as a replacement for page turns, which leads to a malleable page that offers greater fidelity in the pace of advancement. Increased fidelity has resulted in new techniques for influencing the passage of time, creating surprises and raising dramatic tension. These techniques, first seen on the web, are now being adopted by tablet-native digital comics, where they offer an alternative to repurposed print comics and the guided view.

The infinite canvas has also been examined as an alternative to page-based compositions that foregrounds the importance of the spatial network. It is an

approach that offers greater freedom to determine panel spacing and size, which can be used to influence the reader's experience of a comic's diegetic time. Lastly, there has been a consideration of the ways in which animation can be integrated into digital comics. This has included its use to animate the process of panel delivery and how this usage in turn influences narrative. It has also looked at the animation of the content inside comic panels and the pre-digital precedents for its inclusion. This examination has concluded by showing how the integration of screen-based tropes such as animation has highlighted the importance of reader control as a key characteristic of the form.

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5. Hypercomics

Digital comic pioneers have explored many of the possibilities offered by the inherent interactivity and multimodality of digital formats. It is from this period of experimentation and innovation that the hypercomic format has emerged. A hypercomic combines the key characteristics of the form of comics with the multicursal narrative structure of a hypertext. It is a format that foregrounds the importance of reader interaction, with choices made by the reader influencing elements of the narrative. The first half of this chapter provides a description of the format and traces the emergence of the hypercomic from its conceptual roots in the work of Ted Nelson (1974). It considers some of the paper-based and videogame precursors that influenced the development of hypercomics and led to them becoming an offshoot of the nascent webcomic scene. It provides a contextualisation for my own work as a hypercomics practitioner and documents some of the offshoots of the format into physical, gallery-based art installations.

The second half of the chapter then examines these offshoots in more detail, providing an analysis of a selection of hypercomics that address the challenges of architectural spatiality. It takes as its primary case study an architecturally mediated hypercomic created as a practice-based inquiry into the workings of the format. Alongside comics theory, this section draws on the study of narrative space within videogames and media. It considers the use of tropes appropriated from digital comics and explores the tension between fixed sequence and freeform exploration inherent in architecturally mediated works. It examines how spatial positioning impacts on the reading experience and considers the importance of site-specificity in architecturally mediated works.

Definition and origins

A hypercomic can be described as a comic with a multicursal narrative structure. Cursality is the apprehension that there are multiple paths in addition to the one

followed (Peacock 2005). The aesthetic experience of the hypercomic draws on concepts of the maze. A unicursal maze has only one path, no matter how convoluted, while a multicursal maze has many different possible pathways to navigate. Multiple paths within a narrative mean choices must be made by the reader as to which path to follow. As such, a multicursal narrative foregrounds the importance of reader's choice. In a hypercomic, the choices made by the reader may determine the sequence in which events are encountered, the outcome of events or the point of view through which events are seen.

Hypercomics are a type of hyperfiction or cybertext and as such exhibit many of the associated formal properties as identified by Aarseth (1997). They are ergodic in nature, meaning that the reader's experience of the hypercomic's story will often be locally unique based on the specific choices made and pathway formed in navigating the comic. This process of navigation requires a 'nontrivial effort' on behalf of the reader (1). Rather than simply turn the page to progress through the story, progression comes about as a consequence of intention, deliberate choice or inadvertent action on behalf of the reader. The experience of reading a hypercomic can often engender a sense of tmesis. This is the sense of having skipped over or missed something and relates to the reader's apprehension that their own path through the narrative is one of many different potential pathways (Peacock 2005).

Hypercomics have their conceptual roots in Ted Nelson's concept of hypermedia. Nelson himself was the first to coin the term hypercomic in his 1970 paper, *No More Teacher's Dirty Looks*. This paper went on to form part of Nelson's famous conjoined work on hypermedia, *Computer Lib / Dream Machines* (1974). In these texts Nelson defines hypermedia as 'branching and performing presentations which respond to user actions, systems of prearranged words and pictures (for example) which may be explored freely or queried in stylized ways' (313).

He goes on to propose several different examples of possible types of hypermedia. One of these examples is a screen-based educational 'hyper-comic' that:

> branches on the student's request. For instance, different characters could be used to explain things in different ways, with the student able to choose which type of explanation he wanted at a specific time (316).

Nelson focuses on the potential use of the format as an educational tool but the fundamentals of a hypercomic are clearly laid down as a comic that branches into different pathways based on the reader's choice. Nelson's concept of a hypercomic is clearly that of a screen-based, digital format although it would be a while before computer and interface technology would catch up to this idea.

Rather than educational tools, some of the earliest significant examples of hypercomics come from the gaming world. *Dice Man* is a five-issue *2000AD* spinoff that was written and edited by Pat Mills in 1986. It combines the form of comics with the game rules of the *Choose Your Own Adventure* series of books that began publication in 1979 with Edward Packard's *The Cave Of Time* (Montfort 2005, 71). In each issue of Dice Man a character from *2000AD* is placed under the control of the reader, who is instructed to identify themselves directly as that character. The panels of the story are then numbered to indicate reading order, a convention common to early print comics but seldom used in modern formats (Witek 2009, 150). Certain panels in the story ask the reader to choose the character's next action from a range of possible alternatives. Each choice directs the reader to jump to a different panel number, branching the narrative and eventually resulting in one of a range of different endings. In this way *Dice Man* functions as an ergodic text and serves as an example of a paper hypercomic.

The first screen-based hypercomic also appeared in 1986. *Redhawk* (Silhouette Software 1986) is a videogame that was published for the ZX Spectrum, Commodore 64 and Amstrad CPC. Similarly to *Dice Man*, *Redhawk* mixes the tropes of adventure games with those of comics. The videogame uses a text 'parser' and verb system common to text-based and early graphic adventure games (Montfort 2005, ix). By typing instructions the player can control the actions of the game's

titular superhero protagonist. As the game is played, a constantly updating comic strip is created across the screen. This strip illustrates the results of the player's choices and the interaction between Redhawk and the world around him. While visually crude by modern standards, the free-roaming gameplay of *Redhawk* and generative nature of the comic make for an impressively deep hypercomic reading experience.

In 1988 a notable fictional example of hypercomics emerged in popular culture. In the film *Big* (1988), Josh Baskin is a child who magically becomes an adult overnight and then lands a job at the fictitious MacMillan Toy Company in New York. Played by actor Tom Hanks, the adult Baskin rises swiftly through the company and is given the chance to propose a new line of toys of his own invention. The idea he comes up with is for an 'electric comic book' that is 'different every time' it's read (ibid). In some respects the device Baskin proposes is intended to provide a similar reading experience to that offered today by a tablet computer. In his pitch for this device the choice-based, hypercomic nature of the concept is made clear:

> There's this flat screen inside with pictures on it and you read it. And when you get down to the bottom you have to make a choice of what the character's going to do. Like if he's going to go in and fight the dragon then you have to push one of the buttons (ibid).

Also released in 1988 was the Macintosh-based children's adventure game, *Manhole* (Cyan, Inc. 1998). *Manhole* provides the player with an illustrated fantasy environment to explore and interrogate, although whether the game can be considered a true hypercomic is open to debate. *Manhole* has a multicursal structure and makes use of tablodic artwork and word and image blending via the use of occasional speech balloons. But it also exclusively uses full screen images rather than panels in simultaneous juxtaposition and shows a strong reliance on time-based elements of audible sound and animation. This marks *Manhole* out as an interesting edge-case that could also be considered as a hypermedia precursor to the motion comic format discussed in Chapter Four.

Manhole was created by the brothers Rand and Robyn Miller using a piece of Macintosh software called *HyperCard* (Apple, Inc. 1987). Designed to be easy to learn and use, *HyperCard* was one the first widely adopted pieces of hypermedia authoring software. In addition to *Manhole*, it was later used to create a hypercomic adaptation of Art Spiegelman's Pulitzer Prize-winning graphic novel, *Maus* (1986). *The Complete Maus* (The Voyager Company 1994) recreates the pages of the original comic for reading on the screen, adding hyperlinks to background material such as sketches, early drafts, archival documents and photographs (Savage 2005). In this way Spiegelman hoped the hypercomic would act as a 'repository' and 'indicator of the various levels in making *Maus*' (The Voyager Company 1994).

Despite these early examples and the beginnings of a wider awareness in popular culture, hypercomics remained a niche concept through the 1980s and early 1990s. While software like *HyperCard* made it easier to create hypermedia, distribution of these works was still problematic and relied on the use of physical media like floppy disks and CD-ROMs. In 1993 McCloud notes in *Understanding Comics* that 'the idea that the reader might choose a direction [in a comic] is still considered exotic' (1993, 105). Although significantly, McCloud goes on to state that reader participation would be a major issue that comics would need to address in defining their role in the new century (106). Indeed, as outlined in the previous chapter, 1993 saw the beginnings of a major change for the consumption and distribution of comics with the arrival of inline image display to the World Wide Web (Campbell 2006, 15). The webcomics that sprung up as a result of this innovation were quick to embrace the web for display and distribution, but initially ignored the hypermedia potential of the web's underlying structure.

The first true hypercomic created specifically for the web came a few years later in 1996. *Club Salsa* (McKean and Miller 1996) is a 24 part hypercomic intended to promote web developer Wall Data's *SALSA* software. The work is a collaboration between the renowned comic artist Dave McKean and designer and programmer

Chris Miller. The comic embraces the hyperlinked nature of the web to tell the story of a murder mystery set in a strange cyberpunk club where patrons can experience virtual reality via the consumption of specially tailored chillies. In terms of the reader's experience of the story, McKean describes the work as 'a big jig-saw puzzle, with useful information mixed with random elements and dead-ends and all-out entertainment' (Wall Data 1996). As such, the work embraces its hypercomic nature, offering the reader a multicursal maze of narrative to explore and interrogate.

Reinventors

The webcomic scene continued to expand and mature through the 1990s, but its focus remained primarily on the serial formats described in the previous chapter. Towards the end of the decade a new movement of comic creators began to emerge that attempted to challenge this status quo (Campbell 2006, 33). This movement to explore the potential that the web offers for new formats of digital comic was championed by Scott McCloud in his book, *Reinventing Comics* (2000a). The book acted as a rallying cry for a new wave of online experimenters that were later dubbed the 'Reinventors' by Campbell in his history of webcomics (2006, 115). McCloud himself became both an unofficial spokesperson for the movement and a key curator of the growing scene.

Two of the earliest, web-based hypercomics produced during this period were Jason Shiga's *Meanwhile* (2000) and Antony Johnston and Ben Templesmith's *After Days Of Passion* (2001). Although originally created for print, Shiga released a web adaptation of *Meanwhile* that took advantage of the hyperlinked nature of the web. The somewhat awkward process of negotiating the print edition's multiple tabbed pages is streamlined via the use of hyperlinks, making navigation through the comic's complex branching narrative significantly more straight-forward. Nelson asserts that hypertexts are 'best presented on computer display screens' as they avoid the physical limitations of print and allow for 'pathways of any structure the

author wants to create' (1974, 314). *After Days Of Passion* was conceived from the beginning for the web, with Johnston describing the work as 'a collage piece, with no arbitrary narrative structure, inviting the reader to piece together parts of the puzzle themselves, through fragments and shreds of the whole' (2012). Hypercomic creator Neal Von Flue recalls the particular influence of *After Days Of Passion* on his own work:

> It was such a simple and effective implementation of a hyperlinked narrative [...] the reader was allowed to move though at their own pace and in their own fashion. Re-reading it became a joy, as the order in which you ingested the story changed, and the separate events coloured each other differently when rearranged, making the dynamics of the whole piece shift (2012).

My own work as a comics' practitioner began as part of this growing experimental scene, with my first major work being the hypercomic anthology *Sixgun* (2001). At its core, *Sixgun* is an attempt at resolving the conflict between the spatially based form of comics and the non-spatial relationships between linked 'lexia' that are typical of most web-based hypertexts (Landow 1997). Significantly, the piece introduces the concept of panels that operate as hyperlinks while also remaining as spatial constants across the two pages being linked. Each page of the comic acts as a lexia, with hyperlinked lexia sharing a panel of common content and screen position that reinforces their spatial relationship. *Sixgun* also explores an alternate strategy that makes use of McCloud's infinite canvas approach to digital comics. This gives a fixed spatial relationship to all the pathways through the narrative, leading to a hypercomic format in which the spatial network characteristic is significantly strengthened.

In the previous chapter I asserted the power of the infinite canvas to capture in a digital format the spirit of how multipage print works are traditionally read and explored. However, when the concept was initially introduced by McCloud, it was seen by many as a break with tradition. In his history of webcomics, Campbell

provides a description of the early reception to the infinite canvas and the reading experience it provides.

> Narrative comic strips and comic books usually featured cliff-hangers, emotional incentives to turn the page or tune in next time. Infinite-canvas work, more often, relied on an uninterrupted flow, a matrix of spatial relations that pulled the reader from first frame to last. If you were used to taking comics four or six panels at a time, consuming 100 at a gulp was a heady rush (2006, 115-116).

To aid the reader's navigation through the expanded layouts offered by the format, McCloud introduces the idea of the trail - a line connecting all the panels in the narrative which the reader can then easily follow through the story (2000b). *Sixgun* explores the idea that this trail could perhaps branch, introducing a choice to the reader and multiple pathways into the narrative.

McCloud completed his own initial experiment with infinite canvas hypercomics in 2001*. Choose Your Own Carl* (2001) is based on a character introduced in *Understanding Comics* (1993, 84) and features the branching misadventures of its unlucky protagonist. The multiple branches of the comic were created over a two year period as a result of reader suggestions supplied via McCloud's website. Although in keeping with the pattern established by the original Carl story, every branch ends with Carl's death and subsequent gravestone.

Another early *Infinite Canvas* hypercomic is Neal Von Flue's *The Jerk* (2002). Von Flue describes one of his goals in creating the piece as being 'to find a clean way to join [...] two seemingly disparate stories into one reading experience' (2012). The comic combines a scrolling canvas structure with a branching underlay of animated digressions as well as hyperlinked elements of textual meta-commentary. For Von Flue, hypercomics can be defined as a format that 'blends visual storytelling with any of the unique formal properties of computer technology' (ibid). The varied mix

of different web media successfully employed in *The Jerk* provides a good example of this particular outlook on the format.

Zooming

My first significant contribution to the development of the infinite canvas format came with the hypercomic *Doodleflak* (2002), which was the first such comic to employ a zooming interface. This technique allows for the spatial network of the entire comic to be viewed at one level and then for individual segments of the comic to be zoomed into and read. This was a significant development within the field, with previous infinite canvas work only allowing readers to move through the narrative at the reading level. The addition of the zoom allows the reader to experience the entire spatial network of the comic as a single shape. This brings to the fore McCloud's idea of building more direct connections between spatial configuration and narrative, as discussed in the previous chapter.

After my success with *Doodleflak*, I continued to explore the potential for hypercomics to make use of the infinite canvas format. In 2003 I was invited to contribute a section to the gallery-based collaborative hypercomic, *PoCom* (Brooks, Gauld and Gravett 2003). While I initially took a role as one the collaborating cartoonists involved, I was also later given the difficult task of adapting a version of the comic for consumption via the web (Goodbrey 2003). To achieve this I built on my existing hypercomic work and used Flash to create a zooming infinite canvas delivery system that I dubbed *The Tarquin Engine* (2005). The engine proved important both in terms of comic production and reader experience. From a creator's point of view, the engine is coded so as to allow complex, zooming infinite canvas comics to be created using a straightforward drag and drop process in Flash. This greatly simplified the technical aspects of my working method, allowing me to create a whole series of infinite canvas hypercomics in which I was able to focus more on aesthetic and narrative concerns. An example of work from this period,

Never Shoot The Chronopath (Goodbrey 2007), was discussed in detail in Chapter Four.

The engine also made it possible for other comic creators without knowledge of coding to produce zooming infinite canvas comics. One of the first cartoonists to try out the engine was McCloud, who used it to create the improvised hypercomic, *Mimi's Last Coffee* (2004). After some more refinement and experimentation I eventually put a version of the engine on sale in 2005. During the time I spent developing the engine, parallel development was also taking place on a piece of software dubbed simply *Infinite Canvas* (Müller 2004). The Mac-based software was developed by Markus Müller at Vienna's University of Technology and offered creators another useful set of tools for creating zooming infinite canvas comics. Both the *Infinite Canvas* software and *The Tarquin Engine* helped to address important usability issues of infinite canvas comics, such as the awkwardness of scrolling browser windows in different directions in order to follow the path of the narrative.

While remaining popular on the web, the hypercomic format has yet to see much use in comics created for tablets and smartphones. At present these devices are primarily used to provide more traditional, unicursal reading experiences based on fixed sequences of pages. In this respect the hypercomic format faces similar issues to those outlined for the infinite canvas in the previous chapter. However, notable examples do exist that point towards the potential of these new platforms. Interactive fiction author Andrew Plotkin has collaborated with Jason Shiga to release a new version of *Meanwhile* (2011) tailored specifically for iPad and iPhone consumption. While the previous print and web adaptions of the hypercomic both separated the work into distinct page groupings, the new iOS version instead makes use of a zooming infinite canvas structure. Plotkin asserts that this gives the work a new level of fluidity, ensuring that the reader isn't 'bogged down with the mechanics of page-flipping and line-tracing' and that they can instead 'zip forwards at a natural reading speed, and then back up easily' (2011).

I have also experimented with smartphone and tablet-based hypercomics in my own practice. The first of these experiments is *Jack's Abstraction* (Goodbrey 2011). Designed as an app for Android touchscreen devices, the hypercomic makes use of an infinite canvas structure under the gestural control of the reader. To navigate the comic the reader is required to swipe around the canvas, with new panels and pathways appearing as a result of their exploration. In terms of my practice, *Jack's Abstraction* was in many ways a transitionary work. In addition to being my first attempt at understanding a new delivery platform, it was also created in the months leading up to the official start of my doctoral study. Aspects of the work (such as the way the spatial network builds up around the reader's exploration) can be seen as a stepping stone towards ideas of videogame hybridisation that I have explored through practice-based research during this thesis. An examination of the potential offered by such hybridisation and the implications this has for the hypercomic format is provided in Chapter Six.

Gallery comics

At the same time that branching infinite canvas comics were being explored on the screen, a parallel exploration of the form was taking place in physical space. Swedish artist Lars Arrhenius' piece *The Man Without Qualities* (2001) has clear visual similarities with McCloud's *Carl,* even ending several of its paths with the central character's grave. But Arrhenius's work exchanges the electronic canvas for the walls of the gallery, wrapping the pathways of his hypercomic narrative around the corners and doorways of the room. A year later Arrhenius created another similar gallery hypercomic, *A-Z* (2002) that uses a folded-out London A-Z map as the basis for its multicursal narrative.

Arrhenius work is a key influence in the creation of the collaborative hypercomic, *PoCom* (Brooks, Gauld and Gravett 2003). Short for "potential comics," this major hypercomic work began as the brain child of Paul Gravett, Brad Brooks and Tom Gauld. It featured a collaboration between eighteen cartoonists to create a

hypercomic for the wall of the Institute Of Contemporary Art as part of the inaugural *Comica* festival in 2003. The collaborative nature of the comic and formal constraints under which it was created drew on the ideas of *Oubapo*, the comic-based offshoot of the French literary movement *Oulipo*. The original piece measured seventeen meters long and, in terms of scope and complexity, was one of the more ambitious hypercomic projects that had thus far been attempted.

Arrhenius' work and *Pocom* are architecturally mediated hypercomics, with multicursal structures designed to inhabit and be navigated via real world, three-dimensional environments. Gravett states that a 'wide-open space for multicursal comics was provided by the white cube of the art gallery' (2013, 131). Referring to this emergent format as 'gallery comics' (ibid), he notes that these are typically works 'made specifically for exhibition and not necessarily for [traditional] publication' (ibid). Mutard similarly argues that a successful gallery comic cannot simply repeat the dimensions of the page, but instead must be scaled to inhabit the larger gallery space (2013, 287). In this respect gallery comics can be considered as a hybrid format that combines the form of comics with the qualities typical to many examples of installation art.

The Tate Gallery describes installation art as typically consisting of 'large-scale, mixed-media constructions' that may 'occupy an entire room or gallery space that the spectator has to walk through in order to engage fully with the work of art' (2017). Installations are usually designed to inhabit specific spaces or sites, but may later be adapted for installation elsewhere (de Oliveira et al. 2003, 28). They are often described as works that seek to envelop or immerse their audience (Onorato 1997, 29; Coulter-Smith 2006a), requiring the viewer to 'circumnavigate a space' in order to gain a full experience the work (Rosenthal 2003, 23). The spatial configuration of the elements within an installation are accordingly 'modelled or arranged towards the presence of the viewer' (de Oliveira et al. 2003, 35).

A gallery comic shares the above qualities, specifically incorporating sequences of comics into the mix of objects and media that constitute the installation's

construction. This integration of the form of comics tends to place a particular emphasis on the narrative elements found within the installation. These elements are typically presented to viewers as 'fragments that must be explored and assembled' (Coulter-Smith 2006a), requiring viewers to become the 'authors and generators of their own meanings' (de Oliveira et al. 2003, 17). Coulter-Smith asserts that installation art excels at the creation of such multicursal narratives due to:

> the fact that the placement of a variety of objects in a room as part of a single work requires the reader to engage creatively in making connections between the parts […] without the specified linear direction evident in literature, theatre, film, video, music etc. (2006b).

Hypercomics are a particularly good fit for use within installations due to their inherent multicursal structure and their foregrounding of the choices made by the reader in the construction of narrative. While my focus as a practitioner began with the creation of digital hypercomics, as a result of my work on *Pocom* I became increasingly interested in experimenting with further architecturally mediated pieces.

This experimentation eventually led to my participation in a major gallery exhibition of hypercomics at the Pumphouse Gallery in London. The exhibition opened in 2010 under the title *Hypercomics: the shape of comics to come.* It was curated by Paul Gravett and featured the work of four artists - Warren Pleece, Adam Dant, Dave McKean and myself. Perhaps most impressive was McKean's contribution, *The Rut* (2010), which used the gallery space to present a criss-crossing multiple view-point narrative incorporating sculptural elements alongside traditional comics panels. The exhibition was well received critically, receiving five stars in *Time Out* (Charlesworth 2010) and positive reviews amongst the comics press (Round 2011). As such it contributed significantly towards raising the profile of hypercomics amongst both the general public and the wider arts and comics communities.

My own contribution to the exhibition, entitled *The Archivist* (Goodbrey 2010), was created initially for architectural mediation but designed in such a way as to allow for easy adaptation as either a printed or digital comic. Working on *The Archivist* served to highlight and contrast the qualities of these three media and allowed me to develop my thinking on the impact of mediality on the hypercomic reading experience. During this work I started to notice that many tropes of screen-based comics could also be usefully applied to real world, three-dimensional spaces. I also began to wonder how the reader's relationship to the form of comics was changed or disrupted via these acts of architectural mediation. To explore these ideas as part of my doctoral study I began a practice-lead inquiry into architecturally mediated comics. This culminated in 2013 with a public experiment into how the infinite canvas concept could be extended to address the challenges of architectural spatiality.

Black Hats In Hell

The hypercomic *Black Hats In Hell* (Goodbrey 2013) was installed in the Framework Gallery at the University of Hertfordshire in April 2013 (Image 1). A second version of the comic was then installed a few days later in the entranceway of the Platform Theatre at Central St Martins in London. The plot of *Black Hats* is that of a western. It tells the story of two rival cowboys and the cycle of violence that leads to both men’s eventual descent into Hell. The comic is a site-specific work that draws direct influence from the layout of the Framework Gallery. The later version installed at the Platform Theatre is an adaptation of the original work that uses a new configuration of panels based on the layout of the theatre’s entranceway.

Image 1 *– Black Hats In Hell*

Gallery comics have the potential to integrate other elements commonly used in installation art (such as video or audible sound) that can lead to the further hybridisation of the format. However, the primary focus of my study has been on the architectural mediation of the form of comics, rather than this additional potential for hybridity. In developing *Black Hats* I therefore chose to exclude experimentation with such hybrid elements within the narrative. While outside the scope of my doctoral study, the potential for further hybridisation within gallery comics is one of the areas for further study discussed in Chapter Eight. In this chapter, the analysis of *Black Hats* has been structured across five interrelated areas. These include the use of digital comic tropes; the navigation of spaces; the role of links, looking and signifiers; comics across three dimensions; and adapting work to new spaces.

Digital comic tropes

In an architecturally mediated comic, a wall typically offers a space much larger than a standard page and as such draws on a collection of tropes similar to those found in the infinite canvas. While a wall remains more fixed and finite than an equivalent digital space, both media present a creator with a reduced set of spatial constraints. This in turn allows for greater experimentation with the spatial relationship between panels. As discussed in the previous chapter, changes made

to this spatial relationship can influence the reader's interpretation of the passage of time within the comic's narrative.

Image 2 – Panel spacing

Black Hats makes use of this phenomena, keeping to a standard spacing between the majority of its panels and then varying the distance and positioning in certain sequences to achieve specific effects. A larger space between panels in one sequence (Image 2) is used to indicate a longer period of time passing between the depicted events. Parallel to this earthbound narrative, another sequence set in Heaven runs higher up the wall. Here all the panels are positioned much further apart to suggest a more gradual perception of the passing of time. Elsewhere an isolated panel is separated in space from the rest of its sequence (Image 1). This suggests a longer period of time passing without any further events taking place, leaving the reader to dwell on the single depicted image.

In an architecturally mediated comic, the relative position in space between reader and panel sequence can also be used for narrative effect. In *Black Hats*, the parts of the story that take place on earth are primarily displayed around eye-level, locating the reader on the earthly plane. The reader then looks downwards towards

sequences set in Hell and upwards towards sequences set in Heaven. The idea of Heaven as a higher plane and Hell as a lower one is reinforced through their spatial positioning relative to the reader.

Image 3 – Visual onomatopoeics

The previous chapter introduced Barber's concept of 'visual onomatopoeics' (2002, 66) where the animated movement of a panel matches the action depicted within the panel. In *Black Hats*, visual onomatopoeics can be seen operating in sequences that show the characters rising or falling through space. Events such as climbing a mountain, ascending towards Heaven or falling into Hell are mimicked by rising or descending sequences of panels. To read a sequence showing the fall of the cowboy into Hell (Image 3), the reader must tilt their head to follow the panels down the wall. This physical movement on behalf of the reader reinforces the dramatic nature of the fall depicted within the panels.

Navigating spaces

When reading a traditional comic our eyes follow a linked path from panel to panel across the page that allows us to understand the narrative contained in the sequence. Comics theorist Jayms Nichols describes this path as 'the raster of reading' (2013, 304) and further notes that although 'the raster varies depending on the cultural norms and differs from location to location, in western culture it usually runs from left to right, top to bottom across the page' (ibid). In contrast to this fixed reading raster, installation art places an emphasis on the viewer's ability to explore a space without adhering to a single correct pathway through the work. (Rosenthal 2003, 27; Coulter-Smith 2006b). Games theorist Michael Nitsche similarly asserts that three-dimensional space 'implies the option of a different turn at any moment, a new choice or a different perspective that outweighs traditional nodes and links' (2008, 28).

Architecturally mediated comics exhibit a clear tension between the freeform exploration inherent in the three-dimensional space of an installation and the fixed progression dictated by the arrangement of panels in a sequence. Further complicating this relationship, architectural spaces may also impose their own raster of reading on a sequence of panels. This can at times be counter to the left to right, top to bottom raster of the traditional western page. To take *PoCom* as an

example, the seventeen-metre-long work was installed into a space that acted as an entranceway into the rest of the building. As a result, the majority of foot traffic through the space moved from right to left. The comic was therefore designed to be read from right to left, so that the audience could progress through the comic at the same time they moved deeper into the building. This decision impacted not only on the reading order of panels but also on their content, which featured characters chiefly moving through the frame from right to left rather than the more traditional left to right.

The Framework Gallery that contained *Black Hats* featured a similar flow of right to left traffic. Accordingly the comic uses the same approach taken in *PoCom*, matching the raster of reading and flow of action internal to the panels to the primary flow of people through the space. However, *Black Hats* was intended for installation across multiple walls and occupied a space that was significantly more varied in terms of layout. I became concerned that this could lead to choke points in the gallery if all in attendance were funnelled to read the story from the same starting point. The solution to this problem was to tell the story using a looping narrative structure.

This approach was influenced by the structure used by McKean in *The Rut*. The narrative of *The Rut* loops and branches multiple times around the room in the Pumphouse Gallery for which it was created. Gravett notes that the work came presented with ‘no instructions or set order... [leaving visitors] ...to their own devices’ (2013, 132). As such the layout encourages readers to chart their own paths of exploration through both the room and the story it contains. In constructing *Black Hats* without a single clear start or end point, readers can move into the space and choose their own point at which to enter and follow the narrative loop. This approach builds both on the nature of three-dimensional space to empower the reader with choice and the nature of the hypercomic to create narrative pathways locally unique to each reader.

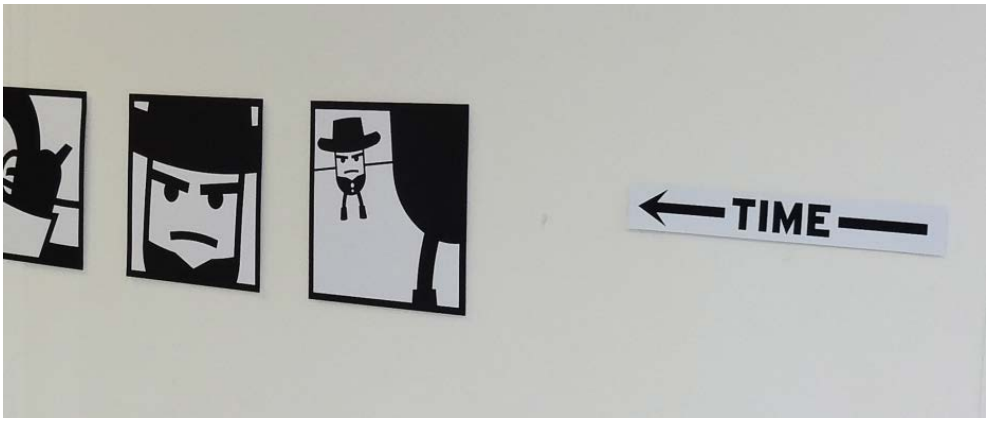

Image 4 – Arbitrary tags

Links, looking and signifiers

To make clear its reading order, *PoCom* makes use of another infinite canvas trope identified by McCloud; the trail (2000b). Trail lines serve as effective navigational aids by linking together panels and making the raster of reading visually explicit. Sometimes (as with *PoCom*) trails also include an arrowhead or similar device to further reinforce the direction of reading. However, given the looser, looping structure at work in *Black Hats*, I decided to forgo the use of trails as an explicit signifier of reading order. Instead, positioned at several points around the room are arrows to indicate the flow of time in the narrative (Image 4). Like the numbering of panels, arrows to indicate reading order are a device common to early print comics that are less often used in modern formats (Witek 2009, 149). When they do appear in modern print comics, Witek notes that 'the use of directional arrows serves to temporarily suspend the normal reading process in order to foreground the spatial relations of the panels' (152).

In the case of *Black Hats*, the arrows present the reader with a choice; to read with the flow of time or against it. The arrows also serve as an example of what Peacock describes as a 'perceptual tag' (2009). In discussing the role of perceptual tags in locative media, Peacock divides their use into two groupings. Embedded tags are 'things that exist already in the environment and are appropriated as signs' (ibid) by an art installation or locative work. Arbitrary tags (such as the time arrows) are

'deliberately placed and carefully designed' signifiers (ibid) that have been added into the environment. Another prominent set of arbitrary tags used in *Black Hats* are the thick black panel borders that frame each image in the comic.

Installation art is sometimes associated with the idea of 'liberating art from the frame' (Davies 1997, 9) or of being an 'unframed form of art' (Rosenthal 2003, 27). However in a gallery comic, framed images often remain a major focus within the spatial arrangement of the installation. Groensteen notes that the frame around an image in a comic 'is always a sign of something to be read' (2007, 53). Hague makes the similar assertion that comics which rigidly enforce the use of panel borders around each image help to strengthen the 'perception of the comic as object' (2014, 52). Accordingly the thick panel borders used in *Black Hats* act as a key signifier for the audience that what they see on the walls is not just a collection of images. Rather they are a narrative sequence; a story told using the form of comics and intended to be read using the process of closure to construct time and motion out of simultaneously juxtaposed images.

Image 5 – Embedded tags 1

De Oliveira et al. note the common practice in installation art of appropriating 'previously existing aesthetic artefacts in order to divert their meaning or intent' (2004). *Black Hats* features two examples of appropriation where pre-existing visual

elements are incorporated into the narrative as embedded tags. In one sequence, a cowboy arrives home to discover his homestead has been set ablaze (Image 5). The panels are arranged so as to incorporate the fire alarm and emergency action instructions that are already present on the gallery wall. Elsewhere in the space an emergency exit sign is similarly appropriated (Image 6). In this instance the image of the doorway in the sign carries across thematically into the nearest panel, which shows the doorway of a saloon. The addition of the word "time" to the sign also draws a connection between this embedded tag and the time arrows, further reinforcing the flow of time within the narrative.

Image 6 – Embedded tags 2

While written words are present in some of the perceptual tags used in *Black Hats*, the comic panels themselves are silent and feature no words or word balloons. In my earlier work on *The Archivist* I took an opposite approach and made heavy use of word and image blending within the narrative, employing a font size similar to that which might typically appear on the printed page. However, this approach ultimately proved to be problematic. In discussing the display of original comic pages in a gallery setting, Mutard asserts that:

> a cognitive dissonance occurs. By being physically present within a gallery, readers will tend to position themselves at a distance from the work for the

> long look, but… [are] …forced to move close and enter reading mode if they are to perceive anything more than the page, or hyperframe (2013, 286).

I observed this tension first hand in readers of *The Archivist,* who at times appeared torn between standing far enough from the work to contemplate the layout of its wider spatial network, and standing close enough to read and follow individual sequences. The solution Mutard proposes to the problem is to increase the scale of the comic so that it better fits the space of the gallery and can be both read and contemplated at a similar distance (287). While this helps to address the tension between sequence and spatial network, it also results in new problems for the blend of word and image.

On the page, a comic reader is familiar with the act of reading word balloons as part of a sequence of panels. As part of the process that Groensteen describes as 'plurivectoral narration' (2007, 108), a reader absorbs the content of each panel in a sequence without visually losing track of the sequence as a whole. For this process to effectively incorporate words, Baetens and Lefèvre highlight the importance of 'minimizing the time gap between the perception of the image [...] and the tracking of verbal signifiers' (2014, 189). However, in some architecturally mediated comics the larger scale of the panels on the wall means reading a sequence involves a physical turn of the head to view all the panels. This can be problematic for word and image blending as it introduces a discontinuity between the focused reading of text in a word balloon and the appreciation of this element as part of the sequence as a whole.

By avoiding the use of written text in its panels, *Black Hats* avoids the problems outlined above. Although by allowing the images to carry the narrative on their own there is also potentially some trade-off in clarity. Harvey cautions that wordless comics can 'ooze ambiguity and inexplicable action' (2002). The intent with *Black Hats* is for the larger sequence of panels to cancel out any unwanted moments of ambiguity that might occur in individual panels. Another approach to the use of text in architecturally mediated comics can be seen in Luke Pearson's contribution to

the *Memory Palace* exhibition at the V&A (2013). In Pearson's infinite-canvas-styled sequence, the conversation between two characters is shown in a separate block of text beneath the related image sequence. By simply separating out word and image, the conflict between reading the written text and consuming the larger image sequence is neatly circumvented.

Comics across three dimensions

Hague makes an interesting comparison between comics and sculpture, noting that traditional printed comics 'allow the mobility of both the object and its spectator' (2014, 53). In contrast sculptural works usually occupy fixed positions that only allow for the mobility of the spectator. Architectural mediation results in hypercomics that also occupy fixed positions in space and that, like sculpture, present 'objects that are intended for viewing from multiple angles and unlike painting or cinema cannot be taken in fully without this requirement being met' (ibid).

In installation art the mobility of the viewer increases further, with the viewer's gaze being 'divided across a spatially extended distribution of objects, rather than being focused on an integral object' (Coulter-Smith 2006c). In examining *The Rut*, Dittmer notes how the three-dimensional quality of the work 'shifted the narrative from being a thread to follow through the comic to being emergent from the space of the exhibit itself' (2011, 381). One of the goals of my public experiment was to further explore this potential of the gallery as a three-dimensional space for comics display. Mutard asserts that in an architecturally mediated work, 'the turn of the wall becomes the equivalent of [the] turn of the page' (2013, 287). Just as with the turn of a page in a traditional comic, blind corners can hide surprises for the reader or suggest a progression in time between the events depicted on the two joining walls (Image 7).

Image 7 – Blind corners

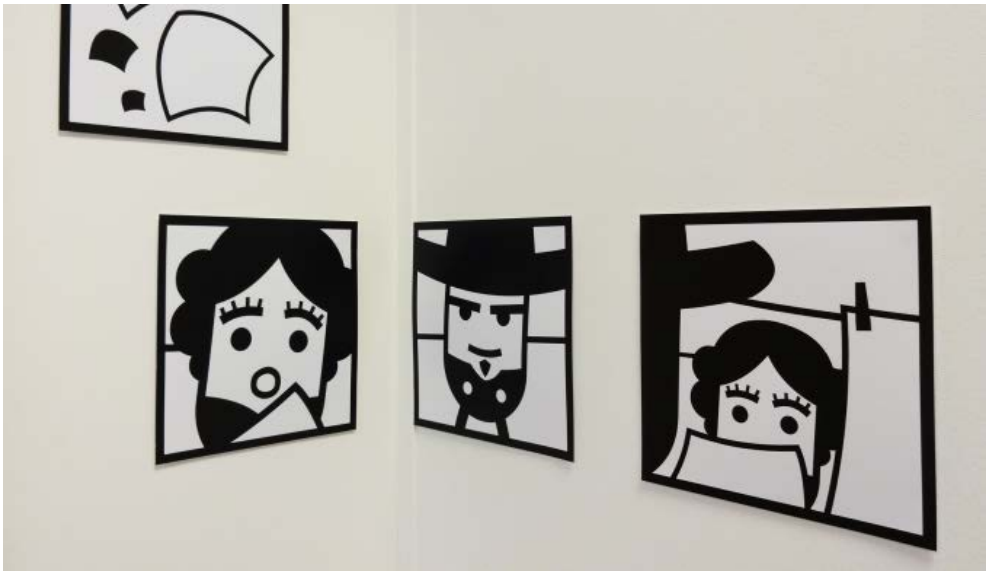

Image 8 – Facing corners

Corners between two facing walls provide other opportunities. In one sequence (Image 8), one cowboy is shown advancing menacingly on the wife of the other. Here the relative position in space between the panels helps to foster the suggestion of eye contact between the two characters, heightening the tension of the scene. Another key sequence in the comic (Image 9) extends the idea of eye contact between panels even further. A pair of parallel walls depicts a classic western showdown between the story's two protagonists. The sequences are anchored together by parallel middle panels that depict the two characters staring out at each other across the space of the gallery. In this manner the layout of the space situates the viewer directly within the sequence of panels as the events of

the gunfight unfold. In describing his experience of *Black Hats*, Gravett notes how readers find themselves caught 'inside a gunfight, between the two cowboys' synchronous points of view' (2013, 132).

Image 9 – Inside a gunfight

While given specific focus during this showdown sequence, the idea of being inside a comic is central to much of *Black Hats*. By considering the comic in Groensteen's 'dechronologized mode' (2007, 147), the reader can explore its spatial network separately from the vector of the narrative. Through explorations of the gallery space, the reader can adopt multiple different points of view within the 'panoptical spread' (ibid) of the comic. In this way the reader is free to chart their own discovery of the juxtapositions, repetitions and symmetries of layout that exist between thematically linked sequences within the story.

Conversely, the inherent freedom of three-dimensional installation spaces can instead be deliberately subverted in order to limit the viewer's gaze or encourage specific angles of viewing (de Oliveira et al. 2003, 18). While asserting the importance of designing a comic to fit the available architectural space, Mutard notes that a creator also has the option to 'construct a space' (2013, 288) specifically to hold the comic. This increases the potential for what Nitsche describes in videogames as '"narrating architecture" that enforces a certain vision through the limitation of the spatial practice within it' (2008, 106).

In Frank Laws' contribution to *Memory Palace* (2013), we see an example of this idea at work in an architecturally mediated comic. A series of panels depicting surrealist urban constructions are arranged inside a tight pentagon of walls. The reader can only view the work from outside the pentagon through narrow gaps at each of its corners. This limits the field of view of the reader so that each corner brings the focus to a different panel in the sequence. In *The Rut* this technique is taken even further, with a sequence of masks placed in fixed positions around the room. By looking through the eyeholes of each mask, previously unreadable elements of the comic's sculptural centrepiece become readable. As Dittmer notes, 'the reader/viewer of this comic is positioned in space such that they, for a moment, embody one perspective of this fragmented tale of violence and regret' (2011, 383).

Adapting work to new spaces

Black Hats is a site-specific installation and as such 'is dependent in large part on the configuration of the space in which it is realized' (de Oliveira et al. 2004, 35). The more an architecturally mediated comic embraces its site-specific nature, the more difficult it becomes to successfully transpose that work to a new location. This limitation of the format became readily apparent during the installation of the second version of *Black Hats* in the entranceway of the Platform Theatre. The new location was configured in a significantly different layout to the Framework Gallery, with the forking nature of the entranceway meaning that foot traffic naturally flowed in two different directions through the space. The looping nature of the narrative remained intact but the right to left flow of the raster of reading no longer aligned as perfectly to how the space was used. In the new version, rather than the flow of traffic through the space being mirrored in the flow of the narrative, the right to left flow in the narrative became the major element leading readers in one direction through the space.

Image 10 – The missing doorway

Elements of layout in the comic that were made in response to architectural features of the original gallery space are also problematic. The sequence depicting the cowboy's retreat to a secluded mountain and eventual plunge into Hell (Image 3) was originally designed around an open doorway in the Framework Gallery. At the Platform Theatre the same sequence had to be laid out against a blank wall where no such doorway exists (Image 10), robbing the arrangement of some of its visual impact.

However, in transposing the work, new synchronicities and interactions between the comic and its environment also suggested themselves. For example, in the sequence showing an angel looking down on proceedings, the nearby wall lights add a bright glow to the artwork that reinforces its heavenly setting (Image 11). The increased space available at the Platform Theatre also allowed room for the incorporation of a series of comic strips by other artists that serve as tangents to the central narrative. These additional story branches serve to enhance the hypercomic nature of the original, providing divergent and parallel viewpoints on the landscapes of Hell and the Wild West.

Image 11 – New synchronicities

Conclusion

This chapter has presented an account of the origins and history of the hypercomic format in both digital and physical contexts. It has identified the format as having a multicursal structure, in which the reader must make deliberate choices as to the path they take through the narrative. Navigating this path may require the reader to follow hyperlinks between linked lexia of panels. Alternatively, it may require them to follow fixed trails of panels in branching, infinite canvas arrangements. In documenting the development of the format, the chapter has further served to contextualise my own contributions as a leading hypercomic practitioner.

The chapter has also presented a detailed examination of the challenges raised by the architectural mediation of hypercomics within a gallery setting. Gallery comics have been identified as exhibiting many of the typical characteristics of gallery-based art installations. The gallery comic *Black Hats In Hell* has provided the focus for a practice-based inquiry in which parallels have been drawn between digital and physical mediations of the hypercomic format. This inquiry has identified useful strategies for the incorporation of perceptual tags and textual elements in architecturally mediated works. It has allowed for a creative exploration of the use of three-dimensional space as a narrative device within the form of comics. Lastly, it

has helped bring into focus some of the issues raised in the adaptation of site-specific works to new locations.

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6. Game Comics

Comics and videogames have a shared history of visual influence and narrative crossover. Today, portable display devices such as tablet computers and smartphones provide common platforms of consumption on which comics and videogames are equally at home. Within this context, this chapter explores the potential for hybridisation between the form of comics and the ludic qualities of videogames. Such hybrids can be described as "game comics." A game comic is a type of hypercomic that exhibits some of the key characteristics of a game and uses some of the key characteristics of the form of comics as the basis for its gameplay. In seeking to analyse the operation of the game comic format, it is necessary to draw on a range of ideas from comic, game and media theory.

The chapter begins with an examination of the different types of visual and narrative crossover that have developed between comics and videogames. The key characteristics of games are identified and the potential interplay of these characteristics with those of the form of comics is considered. This leads into an extended analysis of three game comic prototypes that were created as a practice-based inquiry into the potential of the format; the smartphone app *A Duck has an Adventure* (Goodbrey 2012a), the browser game *Icarus Needs* (Goodbrey 2013a) and the unpublished work, *Margaret Must Succeed* (Goodbrey 2013b). These three major case studies provide the basis for a critically grounded exploration and analysis of how the form of comics can be adapted via hybridisation with the ludic qualities of the videogame.

Videogames and comics

Videogames have their origins in the mid part of the twentieth century, with the game *Spacewar!* (Russell 1961) often cited as the first fully-fledged example of the form (Juul 2005, 3). As videogames have developed as a form, they have also developed a shared history of visual influence and narrative crossover with the

form of comics. Popular videogame franchises such as *Sonic The Hedgehog* (Sonic Team 1991), *Resident Evil* (Capcom 1996) or *World of Warcraft* (Blizzard Entertainment 2004) regularly receive their own comic book adaptations and transmedia crossovers. Similarly, the adventures of comic book characters like *Batman* and *Spider-Man* have been adapted across a multitude of successful games. Videogames and the videogame industry also serve as the backdrop for many widely read webcomic series such as *Penny Arcade* (Holkins and Krahulik 1998-2017) and *PVP (*Kurtz 1998-2017), with gaming at one time forming the single most popular genre in the emergent webcomic scene (Campbell 2006, 49).

The form of comics is at times used as a linking device within videogames themselves. In the third person shooter *Max Payne* (Remedy Entertainment 2001) and the puzzle game *Angry Birds Space* (Rovio Entertainment 2012), rather than animated cut scenes between each level, the narrative is progressed using digital comics in page-like groupings of panels. In the case of *Angry Birds Space*, these groupings are built up on the screen one panel at time using panel delivery techniques similar to those discussed in Chapter Four. Other games such as *Comix Zone* (Sega Technical Institute 1995) and *Comic Jumper* (Twisted Pixel Games 2010) adapt common visual tropes like panels, pages and captions for use in the context of animated, side-scrolling beat 'em ups. This visual appropriation between comics and videogames has moved in both directions. The graphic novel series *Scott Pilgrim* (O'Malley 2004-2010) makes use of popular videogame tropes in its narrative, with its titular protagonist encountering save points, levelling up and collecting coins from defeated enemies.

There have also been some videogames that use the form of comics more directly as part of their gameplay. For example, the superhero videogame *Redhawk* (Silhouette Software 1986) mixes the tropes of an adventure games with a dynamically updating comic strip. Similarly, there have been comic books that integrate aspects of gameplay into their narrative. The five-issue *2000AD* spinoff series *Dice Man* (Mills 1986) combines comics with the game rules of the *Choose Your Own Adventure* book series. Both *Redhawk* and *Dice Man* are discussed in

detail in the previous chapter, which identifies them as early examples of the hypercomic format. Hypercomics exhibit a multicursal structure in which the reader must make choices as to the path they take through the narrative. The nature of the hypercomic as a hybrid between the forms of comics and hypermedia makes it well suited to further hybridisation with the ludic qualities of videogames.

Hybridising comics and games

To examine the hybrid game comic format, it is important to first consider some of the fundamental concepts that underlie games. Juul (2005) provides a useful analysis of a range of different definitions of games and from these identifies six key characteristics of the form. These are:

1. Rules: Games are rule-based.
2. Variable, quantifiable outcome: Games have variable, quantifiable outcomes.
3. Valorisation of outcome: The different potential outcomes of the game are assigned different values, some positive and some negative.
4. Player effort: The player exerts effort in order to influence the outcome. (Games are challenging.)
5. Player attached to outcome: The player is emotionally attached to the outcome of the game in the sense that a player will be a winner and "happy" in case of a positive outcome, but a loser and "unhappy" in case of a negative outcome.
6. Negotiable consequences: The same game [set of rules] can be played with or without real-life consequences (36).

While many games exhibit all six of these criteria, Juul's model also allows for tertiary cases that share most, but not all of the key characteristics. In addition to the above, Juul offers a useful division of games into two major categories. Games of emergence are 'the primordial game structure' (2005, 73) in which a game

consists of a small number of rules that combine to create a large number of different variations of play. In contrast, games of progression are 'the historically newer structure that entered the computer game through the adventure genre' (72). Now common to many modern videogames, players in games of progression must perform a predefined sequences of actions in order to progress through the game.

As a hybrid of the two forms, a game comic must exhibit some of the key characteristics of games and some of the key characteristics of the form of comics identified in Chapter Three. Many of the earlier examples of direct crossover between comics and games fail to meet these criteria. Animated games like *Comix Zone* and *Comic Jumper* do not qualify because although they adopt certain visual tropes, they ignore or replace too many of the key characteristics of comics such as space as time, closure and spatial networks. Similarly excluded are games like *Max Payne* or *Angry Birds Space* where comics are used as a linking device; here the gameplay and comics sections are kept completely separate from each other and there is no opportunity for true hybridisation.

Most of the hypercomics discussed in Chapter Five can also be discounted as they do not display enough of the key characteristics of games outlined by Juul. *Redhawk* and *Diceman* do meet the criteria of game comics, operating both as comics and as games of progression. But in both cases the mechanics of gameplay and the characteristics of the form of comics remain relatively separate. In *Red Hawk,* the play is focused chiefly on interaction with the text parser, while the comic strip is used to visualise the result of this interaction. In *Diceman*, the *Choose Your Own Adventure* structure of play has been grafted on to the spatial network of the comic, but interaction between the two systems is limited.

During the process of practice-based research involved in the creation of new game comic prototypes, the aim has been to achieve a more direct synthesis between comics and videogames. In line with the major focus of my thesis on the digital mediation of the form of comics, these prototypes are digital in nature and

delivered via the screen. The resulting game comics are not just games that are also comics, but games that make specific use of some of the key characteristics of the form of comics in the mechanics of their gameplay. In considering possible areas of crossover that could be conductive to greater synthesis between comics and videogames, my starting point was the use of space within the two forms.

Murray asserts that for some players, 'videogames are about exploring an infinitely expandable space' (1997, 129). Other media (Aarseth as quoted in Gazzard 2013, 17) and game theorists (Zagal et al. as quoted in Gazzard 2013, 132) similarly assert that spatiality is a defining element of the videogame. The exploration and manipulation of space in videogames can form a fundamental part of gameplay, with the unlocking of space serving as a key aspect of a game's reward structure (Gazzard 2011). Similarly, comics are also an intrinsically spatial form. Arrangements of panels in space are used to represent the passage of fictional time and these panels exist as part of a spatial network of interrelations. Spatiality therefore makes for a strong common thread around which to develop new game comics.

In creating the three prototypes discussed in this chapter, I elected to focus on making games of progression. As Gazzard asserts, 'at the heart of this type of game lies the concept of exploration' (2013, 59). The exploration and unlocking of space therefore became a key element of gameplay during this practice-based inquiry. Juul also notes that games of progression often harbour 'storytelling ambitions' in their design (2005, 73). This makes the structure particularly sympathetic to the strengths of the form of comics, which is commonly used to convey narrative via the use of simultaneously juxtaposed tablodic images and word and image blending.

A Duck has an Adventure

A Duck has an Adventure is the first of the three prototypes created during my inquiry. The game is based on the structure of a branching narrative hypercomic. This structure takes its lead from the *Choose Your Own Adventure* book series, where the player must make choices for the central character that influence the direction of the narrative. As an initial attempt at creating a game comic, the intent behind the work was to create something that comic readers would view as a comic and videogame players would view as a videogame. The design of the comic builds on from my existing body of work as a digital comic practitioner, as discussed in Chapters Four and Five. As a result, this first prototype sits nearer the comics end of the game comics spectrum. *Duck* first went on sale as an app for Android smartphones and tablets in February 2012. Its original description on *Google Play* reads as follows:

> A Duck has an Adventure is a unique hypercomic adventure game that challenges you to discover all the different possible lives one duck could live. From adventures on the high seas to the halls of academia and beyond, every choice you make builds a new pathway along which to explore (Goodbrey 2012b).

The app received positive reviews and in March of 2012 peaked at number six in the top ten paid comic apps on *Google Play* (Goodbrey 2012c). Later that year in November, *Duck* was also selected as one of the seven shortlisted nominees in the *New Media Writing Prize* (2012). In May of 2013 a new version of *Duck* was launched that was designed to be played in a web browser (Goodbrey 2013c). This version of the game was free to play, with revenue coming from adverts placed at the start of the game and on the hosting websites. It was made available via online game hosts such as *Kongregate, Armor Games* and *Mochimedia.* This brought the work to the attention of a large gaming audience and as of August 2016, the browser version of Duck has received over half a million plays on *Kongregate* alone

(ibid). This has resulted in lots of direct feedback from gamers, as well several pages of reviews and playthroughs on *YouTube* (2016a).

In both browser and app versions, *Duck* was designed with casual gaming audiences in mind. To target this audience the game comic incorporates what Juul describes as 'juiciness' (2010, 45); an excess of positive feedback that rewards the player for their interaction. One way *Duck* achieves this is through its use of animated panel delivery; when panels are tapped or new panels appear, they react and move with a satisfyingly elastic springing motion. Pursuit of juiciness also means encouraging regular interaction between the reader and the screen. A standard digital comic might require the reader to only interact with the screen when clicking or swiping to turn the page. But rather than being based around a digital recreation of a page, *Duck* uses an infinite canvas approach (McCloud 2000, 222), treating the screen as a window onto a much larger network of panels.

To navigate this network, the reader must regularly tap the screen to shift the focus of the window and make new panels appear. This places an emphasis on the reader's control over the pacing of the comic and establishes a regular rhythm of interaction, helping to ensure that 'moving the character and/or object through the game space becomes habitual' for the player (Gazzard 2013, 99). For this habitual process to work successfully, the player has to be able to consume the information in each panel quickly before tapping to bring up the next in sequence. To help achieve this, the tablodic images in *Duck* follow the principle identified by McCloud as 'amplification through simplification' (1993, 30). Narrative is conveyed by a combination of tersely worded captions and simple, icon-like images that can be quickly consumed and understood by the reader.

Gazzard notes that in a videogame, it is 'often the feeling of discovery that keeps players within the playworld' (2013, 8). This sense of discovery is enhanced in *Duck* via the addition of two common gaming tropes; collectable hats that the player can find through exploration and an achievement system that rewards continued progress through the narrative. A scoring system is also provided that indicates the

current number of hats, achievements and endings that the player has discovered, as well as the total number of each to be found in the game. These scores provide a metric by which the player can measure how much of the game they have completed. Seeking completeness then becomes a game in itself, as the player tries to uncover all of the possible narrative pathways in order to collect every hat, achievement and ending.

The addition of this completeness metric is a marked departure from my previous hypercomic work. In a typical hypercomic such as *The Formalist* (Goodbrey 2004) or *Four Derangements* (Goodbrey 2009), the reader may at times experience a sense of tmesis; the feeling that in choosing one path from the many potential narrative pathways, they may have skipped over or missed something important (Peacock 2005). Both *The Formalist* and *Four Derangements* lack any indicators as to which paths have already been followed or how much of the comic might still remain unseen. In contrast, by quantifying the amount that has been seen and unseen, the tmesis in *Duck* is diminished and refocused to become an explicit problem for the player to solve.

Another way *Duck* differs from my previous hypercomic work is in how it makes use of the infinite canvas. In hypercomics like *Never Shoot The Chronopath* (Goodbrey 2007) and *Doodleflak* (Goodbrey 2002), the entire temporal map of the comic is laid out from the very beginning. With the whole spatial network of the comic already constructed on the screen before them, readers are free to zoom in and read the story at any point or zoom out to navigate between different sections of the narrative. However in a game, this approach would be problematic. As Gazzard asserts, players 'do not expect to have the full game world open to them; to do so would take away the exploratory and learning aspects of the game that the players need to keep playing' (2013, 103).

Accordingly in *Duck*, players begin with only a single panel of the comic visible and then construct the temporal map themselves through their play. While *Duck* does offer the player the ability to zoom out and view the whole temporal map of the

comic, in its initial design this was not the case. The zooming feature was only added later in development as a result of player feedback. The methodology for my practice-based inquiry established in Chapter One stresses the importance of 'understanding how audiences engage' with interactive work (Candy and Edmonds 2011, 122). The portable nature of smartphone apps meant that early builds of *Duck* could easily be passed around amongst friends and colleagues in order to observe their interaction with the game.

The qualitative feedback received through this process filled a similar role to playtesting in videogame design. Fullerton identifies playtesting as 'the single most important activity a designer engages in,' providing a vital way to 'gain an insight into whether or not the game is achieving your player experience goals' (2008, 248). The early feedback I received on *Duck* indeed proved invaluable, influencing several aspects of the game's design. The most common request amongst testers was for the addition of a zoomed out view of the comic's spatial network that would serve as a record of where they'd been and the choices they'd made in the game so far. Being able to see the current state of the whole temporal map aids not only in basic navigation, but also in identifying the unexplored pathways that are necessary to achieve full completion of the game. Using the map in this way 'requires the player to memorize parts of it in order to remember another sequence of possible spatial events and [the map] becomes as much a part of the problem solving of the game as the navigation itself' (Gazzard 2013, 82).

In *Duck*, some of the final narrative paths needed to fully complete the game only become accessible once the player has visited the same event via two different pathways. Accordingly, the zoomed out view serves a vital function for those engaged in completeness-seeking gameplay. This aspect of the game will be considered further in the next section of the paper, where it will be examined in contrast to the gameplay of the second of my game comic prototypes.

Icarus Needs

The second prototype, *Icarus Needs*, is influenced by both text-based interactive fiction games like *Zork* (Infocom 1980) and graphical adventure games like *The Secret of Monkey Island* (Lucasfilm Games 1990). Montfort outlines some of the key characteristics of such games:

- a potential narrative, that is, a system that produces narrative during interaction;
- a simulation of an environment or world; and
- a structure of rules within which an outcome is sought, also known as a game (2005, 23).

The narrative of *Icarus* concerns the plight of cartoonist Icarus Creeps, who has fallen asleep playing videogames and now finds himself stuck in a surreal, metafictional dream world. The intent with the game was to build on the lessons learned with *Duck* and to push towards something that felt more game-like in its nature. Given the success achieved by *Duck* as a browser game, *Icarus* was designed from the very beginning to take advantage of this distribution platform. It was released across multiple online game-hosting websites in July 2014. The game shared the success of its predecessor, receiving over half a million plays by August 2016 and generating similar amounts of player feedback via comment threads (Goodbrey 2013a) and YouTube (2016b).

Montfort notes that a typical adventure game 'simulates a world that the interactor is supposed to figure out' (2005, 21). He further asserts that much of the fun in an adventure game comes from the act of exploring the game world itself (4). My goal with *Icarus* was to create a simulated world that the player could explore, interrogate and solve via the form of the comics. Unlike a normal comic, the narrative of *Icarus* is not laid out in advance for the reader to read through and absorb. Adventure games are not themselves narratives, but 'produce narratives when a person interacts with them' (23). Accordingly in *Icarus*, the narrative is

created via the player's exploration and interaction with the comics-mediated world presented in the game.

During the game the player has control over the character of Icarus Creeps and is able to move him around from panel to panel in order to interact with the other characters and objects found in the world. It is important to stress that this movement is achieved using only the characteristics of the form of comics. The reader always remains in control of the pace at which they absorb the information and no animation is used at any point inside the panels of the comic. Instead, movements in time are represented through movements in space and rely on the reader's use of closure to interpret the changes in the juxtaposed images that form the comic's spatial network.

In addition to these comic-derived characteristics, *Icarus* also features a responsive, non-diegetic musical soundtrack similar to the 'adaptive audio' systems commonly used in videogames (Nitsche 2008, 135). An exploration of the use of adaptive audio in conjunction with the form of comics went on to form the basis for a later game comic prototype, entitled *The Empty Kingdom* (Goodbrey 2014). The use of audible sound in *Icarus* and the design and development of *The Empty Kingdom* will be discussed in detail in Chapter Seven.

To keep *Icarus* accessible for the casual player, I tried to simplify the gameplay mechanics as much as possible. Icarus Creeps is limited to carrying a single object at a time and the player only controls the character's movement, with environmental interactions being triggered automatically on entering the appropriate panel. By collecting certain objects and applying them in the correct situation, the player is able to solve simple puzzles and progress further through the game. These puzzles form a key element of the narrative that unfolds in *Icarus*. Montfort highlights their importance to the adventure game genre, stating that: 'The puzzles in a work of interactive fiction function to control the revelation of the narrative; they are part of an interactive process that generates narrative' (2005, 3).

The player in *Icarus* is engaged in two simultaneous processes; they are attempting to both appreciate the world of the narrative and solve it in order to successfully traverse the game. In traversing the game world, players may at times be lead in certain directions by elements of the environment they encounter. Near the start of *Icarus,* a sign on the wall points in the direction of "reality" in order to encourage players to make their way further down the corridor. Later in the game a hot air balloon and the empty panel of sky above it suggests to players that they might take flight and explore the skies. However, it is important to stress that ultimately it is always up to the player to determine their own path through the world. This freedom of choice is a key element of videogames, which offer us 'the empowered experience of navigating our own individual paths' (Gazzard 2013, 8).

Murray notes that the ability to navigate through virtual landscapes 'can be pleasurable in itself, independent of the content of the spaces' (1997, 129). This pleasure in navigation is one aspect of player agency, which can be defined as 'the satisfying power to take meaningful action and see the results of our decisions and choices' (126). In aiming to make *Icarus* a more game-like experience than *Duck*, I took advantage of the browser-based aspect of the design to give the player direct control over the game's protagonist via the arrow keys on the keyboard. With this control in place, the representation of the protagonist serves as an avatar for the player within the game. The agency of the player in *Icarus* is significantly enhanced by the presence of an avatar with which they can identify and use to navigate the game world. When considered in comparison to the earlier *Duck*, this increased sense of player agency is one of the key factors that makes *Icarus* feel more game-like in its nature.

Another set of linked concepts that are important to consider when comparing the gameplay of *Duck* and *Icarus* is the pairing of 'aporia and epiphany' (Aarseth 1997, 90). Aarseth describes aporia and epiphany as the 'pair of master tropes [that] constitutes the dynamic of hypertext discourse: the dialectic between searching and finding typical of games in general' (91-92). In terms of gameplay, aporia can be thought of as either the puzzle or the pause the player takes in order to try to solve

the puzzle. While epiphany is the realisation of the solution that allows the player to progress onwards to the next area or puzzle within the game (Gazzard 2013, 103). In *Duck*, the majority of the aporia-epiphany loops in the gameplay come only towards the end of the game as the player searches for the final hats, endings and achievements needed in order to achieve a complete playthrough of the game. This play takes place primarily on the zoomed out view of the temporal map, which becomes of strategic use to the player as they attempt to spot unexplored branches or find new pathways to unlock.

In contrast, *Icarus* spreads the player's experience of aporia-epiphany loops much more evenly throughout the entire length of its gameplay. The player is presented with regular gates to progress that must be overcome through further exploration of the game world and the correct application of the items the player discovers. As the solution to each puzzle is reached, the moment of epiphany is accompanied by the reward of newly unlocked areas of space to explore and new puzzles to solve. In this manner *Icarus* manages to deliver a significantly better-paced gameplay experience than *Duck*, again highlighting the latter of the two prototypes as the more consistently game-like in its nature.

Margaret Must Succeed

The first two prototypes are games of progression based in the exploration-driven adventure genre. With the third prototype, *Margaret Must Succeed*, my aim was to create a comic that drew tropes from a different genre of games. *Margaret* is a narrative puzzle game originally intended for release both as a browser game and Android App. Like *Icarus, Margaret* has a regular, game-like distribution of aporia-epiphany loops but it removes the focus on exploration found in both *Icarus* and *Duck.* In a puzzle game, the puzzles may still act as gates to control the reveal of narrative but for the player the focus is placed more on the puzzles as being:

> pleasurable in themselves. The suspense that accompanies an attempt to find a solution to a challenging puzzle, or the anxiety that develops from not finding one right away, is a significant part of what makes the puzzle so fascinating and engaging (Danesi 2002, 226-227 as quoted in Juul 2005, 93).

There are already some examples of game comics that exhibit this focus on puzzle solving in their gameplay. *Strip 'Em All* (Athletic Design 2013) is a browser-based puzzle game in which the player rearranges panel sequences and manipulates the visual and textual elements in panels to 'reveal the inner nature of the characters' in each comic (ibid). *Storyteller* (Benmergui 2013a) is a puzzle game intended for iOS, Mac and PC In which the player builds 'visual stories by placing characters and props into a comic-like sequence of frames' (Benmergui 2013b). In both game comics, the mechanics of play revolve around the player repositioning elements of the spatial network to create new meaning and narrative sequence out of sequentially juxtaposed images.

Strip 'Em All and *Storyteller* demonstrate 'the pleasure of transformation' that Murray identifies as being inherent to digital media (1997, 154). In a similar manner to the panel delivery techniques discussed in Chapter Four, digital mediation results in a comic format that 'becomes more plastic, more inviting to change' (ibid). Hybridisation with the mechanics of puzzle games extends this plasticity further, giving the player a greater sense of agency in their transformation of the panels and sequences in each comic. *Margaret* also shares this quality, with a central gameplay mechanic based on swapping around key panels in the spatial network to 'swap fates' between the different characters in the game (2013b). Unlike *Storyteller* and *Strip 'Em All* which rely on stand-alone stories to provide the basis for each puzzle, *Margaret* uses this mechanic to tell a single, ongoing narrative.

The game's story follows the journey of Margaret, a young woman who must cross the city on a mysterious errand. Her journey is shown in a line of comic panels across the middle of the screen. The lives of other people in the city are shown in lines of panels above or below Margaret's. Certain panels in each line are

highlighted as being swappable. When swapped, they alter the panels around them, creating new sequences of events that may change the content of another swappable panel. Each screen of panels represents one puzzle within the game, which the player must solve by changing events so that Margaret is able to continue her journey and progress forward to the next screen and the next puzzle.

As the game progresses the challenges facing Margaret transition from the mundane (a missed bus; an empty phone battery) to the extraordinary (armed police raids; terror attacks). Juul notes than in puzzle games there is often an expectation on the part of the player for each puzzle to have 'one single, perfect solution' (2005, 112). Aspects of *Margaret's* design deliberately play against this expectation. While each puzzle has only a single solution, in terms of the narrative this solution is deliberately imperfect; by solving each new puzzle the player makes the world better for Margaret, but worse for everyone else around her. As Margaret's actions become increasingly malign, the narrative is intended to make the player question their own complicity in the chaos Margaret's success causes for the rest of the city.

Although the player's actions may generate multiple different narratives while attempting to solve each puzzle, only a single correct configuration allows the player to progress further through the game. This aligns with Juul's classification of games of progression as characteristically featuring 'more ways to fail than to succeed' (73). Juul asserts the need for successful progression-based puzzle games to initially assist the player in understanding the mechanics of play and then to escalate in difficulty as the game progresses (97-101). In *Margaret* the first two puzzles feature limited options as to which panels can be swapped and additional written instructions that inform players of the basic mechanics of the game. As the game progresses the puzzles increase in complexity, adding more parallel timelines that necessitate more swapping and re-swapping of panels to achieve each solution. In the more difficult puzzles, the complexity of the spatial network is increased by the potential to create multiple different narrative sequences in which

panels form new juxtapositional relationships that require new acts of closure to interpret.

Sustaining the escalation in difficulty in *Margaret* without over-taxing the player's ability to interpret the comic's spatial network proved challenging as development of the game continued. Designer of *Strip 'Em All* Ola Hansson observes that developing 'interesting stories for our game is not so hard, of course, what is hard is making those stories fun and challenging to play' (2013). *Storyteller* creator, Daniel Benmergui encountered similar problems in developing his game comic. Although the playable alpha version of *Storyteller* was complete enough to win the Independent Games Festival Innovation Award in 2012, Benmergui suspended development of the game before its final release (Benmergui 2013c). He attributes this decision to feeling 'creatively numb', stating that time away from the game was needed to better resolve 'a few important things' in the game's design (ibid).

The difficulties encountered by Hansson and Benmergui were mirrored in my own work on *Margaret.* More complex puzzles required more complex coding to implement. Additional work was also required to ensure that all possible panel combinations within the spatial network resulted in comic narratives that made sense when read in sequence. The creation of new, different and more complex puzzles proved increasingly hard, while the informal testing of existing puzzles amongst friends and colleagues pointed to other problems with the gameplay. Players reported some puzzle solutions as feeling too arbitrary and too easy to achieve through the trial-and-error swapping of panels. It was this combination of factors that eventually lead me to suspend development on *Margaret.*

While I may return to the game at a later stage, I decided that continuing to iterate on the design within my doctoral study would not be the best use of available time and resources. Despite the game comic being unfinished, my work on *Margaret* has provided useful insight into another approach to hybridising the spatial qualities of comics and videogames. The problems encountered in completing the game also serve to highlight the difficulty of achieving a successful combination of narrative

and gameplay within the game comic format. Creating content in a game comic requires competencies in both games design and comic creation; challenges that arise out of either discipline can destabilise the success of the project as whole.

Conclusion

This chapter has examined some of the shared history of visual influence and narrative crossover that exists between comics and videogames. Today, the digital mediation of comics has led to the two forms sharing the same platforms of consumption and distribution; it is in this context that the hybrid format of game comics has been examined. In this chapter, game comics have been identified as a format of comic that exhibits some of the key characteristics of a game and uses some of the key characteristics of the form of comics in its gameplay. The creation of three game comic prototypes has allowed for an analysis of the ways in which the spatial nature of the two forms can provide common ground for such hybridisation to occur.

The practice-based study documented in the chapter has examined how comics can adapt to incorporate gaming tropes from the adventure and puzzle genres, without losing the qualities that make them recognisable as comics. It has provided insight into how comic narratives can incorporate progression-based gameplay and how gameplay in turn can create narrative. It has looked at the ways in which the format differs from the related format of hypercomics, identifying player agency and aporia-epiphany loops as important markers in determining whether one game comic is more game-like than another. It has also examined some of the practical and conceptual difficulties that can problematize and limit successful game comic creation.

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7. Audible Comics

This chapter explores the role of sound in comics and provides a critical analysis of how that role has been impacted by the digital mediation of the form. Groensteen asserts that traditional comic books are monosensory, relying solely upon the sense of sight (2013, 69). In contrast to this he identifies digital comics that incorporate elements of audible sound as being 'plurisensory' (ibid). During my work as a comics practitioner I have created a number of plurisensory digital comics that incorporate elements of audible sound. This chapter will examine the format of the "audible comic" by drawing examples from both my own practice and the work of contemporary digital comic practitioners. The examination will be aided by a case study of *The Empty Kingdom* (Goodbrey 2014), a new game comic hybrid created as a practice-based inquiry into the incorporation of audible sound with the form of comics.

During the chapter sound will be considered as an element of both navigation and narrative. The differences between 'imagined' and 'perceived' sound will be outlined (Hague 2014, 65) and the relationship between sound and diegesis in comics will be explored in detail. Parallels and influences from the use of sound in film and videogames will be examined. Included in this examination will be a consideration of the ways in which audible sound can influence the act of reading and the implications of this for digital comic formats and the form of comics. Different approaches to the integration of audible sound will be explored, with an emphasis placed on the importance of reader control over the play and synchronisation of audible elements.

Sound in navigation

Groensteen's monosensory view of traditional comic books is challenged by Hague (2014), who asserts that the experience of reading a comic book has on some level always been a plurisensory one. Hague notes that the act of reading a comic book is

not silent and that 'the sound of a turning page emphasises the "objectness" of the comic' (72). He also states that although 'they could be classed as incidental, these sounds comprise elements of the comic's character, they tell the reader certain things about the progression of the text and the modification of the comic as an object' (65).

In the earliest of my own experiments with sound in digital comics, my approach was to treat audible sound much as Hague outlines above. In the hypercomic *Doodleflak* (Goodbrey 2002), the reader is presented with a zoomed out view of the entire comic, arranged in the pattern of a snowflake. They can then click on individual branches of the flake, which initiates an animated zoom and rotation that allows them to read their chosen section of the comic. Audible sound is used as part of this navigation process, with one sound playing to accompany the act of zooming in, and another sound playing when the reader chooses to zoom back out. Just as animation has been used as a replacement for the motion of the page turn found in a typical paper-based comic, so these effects serve as a replacement for the sound of the page turn. This approach therefore treats audible sound as an element of the digital comic's character and uses it to give information about the progression and modification of the "virtual" comic object.

Sound in narrative

In Chapter Three, word and image blending was identified as a key characteristic of the form of comics. In this respect Cohn describes comics as being multimodal as they are 'essentially written in two languages: the visual and the written/verbal' (2013, 13). One approach to incorporating audible sound into a digital comic is to treat that sound as an element of the comic's narrative. This approach is enabled by the multimodal nature of the comics form. Within the multimodal narrative of a paper-based comic, sound is represented by images and words on the page. From these visual elements the reader constructs sounds that are 'imagined rather than perceived' (Hague 2014, 65).

Smolderen attributes the origins of this multimodality to a period of experimental 'graphic hybridization' (2014, 47) that took place during the nineteenth century. The result of this experimentation is a hybrid form that operates as 'an audiovisual stage on paper' (ibid). Smolderen asserts that it is this hybridity in comics that provides the opportunity for further hybridisation with other forms (60). In a digital comic, the potential exists to extend the multimodality of the form to also incorporate elements of perceived audible sound. Sounds that become part of the diegesis of the story and 'are consciously integrated into the work to supplement or even facilitate the narrative' (Hague 2014, 73).

To examine the role that audible sound might play in the narrative of a digital comic, it is helpful to first examine the concept of diegetic sound in more detail. In film, diegetic sounds are sounds presented as originating from a source within the story world of the narrative, while non-diegetic sounds are sounds that come from a source outside the world of the story (Bordwell & Thompson 2013, 284). These same definitions can also be applied to comics. In *Doodleflak*, the use of audible sound as an element of navigation is clearly non-diegetic, as the sound has no clear origin within the story world of the comic. In contrast, the visual representation of imagined sound on the page can at times demonstrate a more complex relationship to the diegesis.

Limited compositional space means that comic creators are selective about which sounds they chose to represent on the page. Usually, only those sounds that directly serve an aspect of the comic's narrative or aesthetic are displayed. Lacassin describes some of the typical approaches taken to the visual representation of sound, observing the existence of:

> a high level of phonetic realism. A car… [emits] …a "roooaaar" or a "vroom vroom". A trotting horse makes a "clippity clop". These graphic onomatopoeias ripple, explode or wind their way along inside the frame, traversing it in every direction (2014, 40).

In addition to these visual effects, a common device used to represent sound within the narrative is the balloon. Balloons are used to convey the spoken words or sounds of the various characters and objects that inhabit a comic's story world. The style in which a balloon is illustrated may be used to convey further information about the qualities and origin of the sound it contains. Lacassin provides some examples of commonly used effects, describing how 'a dotted outline… [indicates] …whispered asides; saw-toothed edges indicate a retransmitted voice (by telephone or radio) or a recorded voice. A word balloon adorned with stalactites signals the icy tone of hostility' (2014, 39).

Eisner describes the balloon as a 'desperation device' for artists as it 'attempts to capture and make visible an ethereal element: sound' (2003, 26). Smolderen views speech balloons as 'a reified image of human speech' (2014, 53) that situate the speech 'as a sound object within the image' (ibid). In examining this function of balloons, Miodrag notes that while they are 'not visible in the world-of-the-work as they are to the reader, these forms represent diegetic material nonetheless, visualising for the reader what is audible for characters' (2013, 100). The balloon itself is a non-diegetic container or carrier; a signifier of speech that exists outside the story world. But the contents of the balloon are diegetic, as they represent the direct speech of the characters within the story world. Cohn provides a useful examination of the balloon in its role as a carrier of diegetic content, describing how they 'function to encapsulate text (or images) that interface with a "root" through a "tail." With speech balloons […] the balloon is the carrier, the speaker is the root, and the tail is the tail of the balloon' (2013, 35).

In a digital comic, attempts to integrate audible diegetic sound are problematized by the lack of such elements to contain the sound and connect it with the events being visually depicted. As a result, the role of the rooting object becomes more significant in providing audible sounds with a visual point or origination within the narrative of the comic. An example of this can be found within my own practice in the webcomic series, *The Mr. Nile Experiment* (Goodbrey 2003). *Mr. Nile* is a

metafictional series in which the titular protagonist carries out a series of experiments in an attempt to determine the nature of his fictional reality. The twenty-second instalment of the series depicts Nile standing next to a small radio, which he explains to the reader is 'an avatar, really. Something to give the sound a point of origin within the narrative… [and] …I'm going to need just a little help on your end to synch things up' (ibid).

The rooting object in this case also functions as a button which the reader is required to click in order to switch on the radio. Once the radio is switched on a piece of audible music begins and Nile can be observed visually reacting to the music that both he and the reader can now "hear." In requiring the reader to click on the rooting object to start the music, it not only integrates the music into the diegesis of the comic, but also aligns the sound to a specific point in the reader's progress through the spatial network of the comic.

A different approach to the integration of audible music into the diegesis can be seen in another webcomic from the same period, *Devil in the Kitchen* by Kean Soo (2003). The narrative of the comic follows a group of friends watching the musician Ashley MacIsaac playing a gig at a local music venue. The layout of the comic is in a similar infinite canvas style to *Mr. Nile,* with the panels arranged on one long webpage which the reader scrolls through to read. However, unlike *Mr. Nile,* a play button and progress bar for an MP3 file sits separately from the comic at the top of the webpage.

To experience the visual narrative of the comic and the audible music track together, the reader must first press play on the MP3 file before then commencing to read and scroll through the comic. As the audio recording of the titular instrumental track *Devil in the Kitchen* plays back, its exact relationship with the diegesis of the comic is uncertain. Rooting objects such as a set of drums, a guitar and a fiddle can be seen in repeated panels in the comic, offering potential points of origin for the music within the diegesis. But mixed in with these are several

panels showing the reaction, excitement and applause of the listening crowd, the audible sounds of which are noticeably absent from the MP3 recording.

Ultimately it is the placement of the MP3 player outside the diegesis of the comic that proves most problematic to the integration of the audible music track as, unlike *Mr. Nile,* the comic lacks any fixed points of synchronisation between the soundtrack and the events being visually depicted. This distinction places *Mr. Nile* into the category identified by Hague as 'sounds in comics' (2014, 73) while *Devil* fits better in the alternate category of 'sounds with comics' (77). This latter category is typified by the reader listening to an audible sound recording while reading a separate comic narrative, without any points of direct synchronisation occurring between the two. Although this is not to say that the two share no interaction at all. To take the example provided by *Devil,* it is noticeable that the high tempo of the musical track can influence the reader to adopt a faster pace in their reading and scrolling of the comic. Hague notes that the more audible sound is relied on to set the reading pace, the more the 'visual content of the comic is subordinated, in temporal terms, to the audible, which directs the speed at which the performance should take place' (77).

Parallels to this can be drawn from the relationship between sound and image in film. Chion notes that on 'first contact with an audiovisual message, the eye is more spatially adept, and the ear more temporally adept' (1994, 11). However, for digital comics this is a potentially problematic phenomenon. As examined in Chapter Four, the digital mediation of comics has introduced the potential to include animated, time-based elements to what was previously a spatial, non-time-based form. This has in turn highlighted the importance of the reader's control over the pace of their reading as a key characteristic of the form of comics. In Chapter Three it was asserted that for a digital comic to still operate as a comic, the rate at which information is absorbed must remain under the reader's control.

Responsive soundtracks

The nature of this potential conflict between reader control and audible sound is highlighted by Groensteen, who identifies two different temporalities at work in audible comics, 'the concrete, measurable time of motion and sound, and the indefinite, abstract time of comics narration' (2013, 70). When the reader has to adjust their pace to match the length of a piece of animation or sound, their control over their reading rhythm 'is sacrificed - or else this synchronization may already have been programmed by the author, who therefore also imposes the rhythm' of progression (ibid). Priego asserts that the use of 'synchronous animation with sound' that takes control away from the reader 'belongs to a different realm in which comics stop being comics' (2010, 277).

To overcome this problem, the key lies not in making the reader adapt their reading to the audible soundtrack, but instead making the soundtrack adapt and synchronise to the process of reading. In *Nile*, the clickable rooting object acted as a crude form of reader-controlled synchronisation. While useful in a metafictional story with direct reader-character interaction, such a technique would be less appropriate in a more traditional narrative, where the nontrivial effort of clicking to activate the sound might interrupt the reading process. Hague describes a more elegant approach to the problem, in which the reader navigates through the comic and 'the sound system is set up in such a way that the soundtrack responds to the reader's position in the narrative, replaying sound effects or adjusting the soundtrack to fit the relevant panel' (2014, 76).

The result is an audible comic with a truly responsive soundtrack in which 'the reader is […] given control over the way in which the soundtrack functions' (76) and there is no interruption of the reading flow. A good example of this approach can be found in the third part of Stevan Živadinović's webcomic, *Hobo Lobo of Hamelin* (2011). The comic's narrative is a take on the *Pied Piper of Hamelin* legend, with each part of the story laid out in a sideways-scrolling infinite canvas format. In terms of the comic's use of audible sound, it is interesting to note that many of the

concepts identified by Chion in his analysis of film soundtracks can also be seen at work in the responsive soundtrack of *Hobo Lobo.* Foremost of these is the principle of 'added value' which Chion defines as:

> the expressive and informative value with which a sound enriches a given image so as to create the definite impression [...] that this information or expression "naturally" comes from what is seen, and is already contained in the image itself. Added value is what gives the (eminently incorrect) impression that sound is unnecessary, that sound merely duplicates a meaning which in reality it brings about, either all on its own or by discrepancies between it and the image (1994, 5).

Part three of Hobo Lobo opens at night on the edge of the woods. Accompanying the artwork that establishes this scene is a looping diegetic soundtrack that consists of the ambient sounds of the forest at night. Chion describes sounds used in this way as 'territory sounds, because they serve to identify a particular locale through their pervasive and continuous presence' (75). He notes that such ambient sounds can envelop 'a scene and inhabit its space, without raising the question of the identification or visual embodiment of its source' (75). In this instance none of the animals and insects responsible for the sounds in the soundtrack can be seen. Instead it is the overall image of the forest which can be thought of as the rooting visual element within the comic.

In response to the reader scrolling through the comic, a piece of harmonica music slowly fades up in volume as on the screen a parade of rats can be seen making their way through the forest. Initially the relationship of the music to the diegesis of the story is uncertain but as the reader continues to scroll the rooting image is revealed; the comic's lupine protagonist playing his harmonica and leading the parade of rats. Chion identifies a similar phenomenon in film, where music can 'narrow into' (81) the diegesis once the originating instrument appears onscreen. According to Chion, shifts in music between non-diegetic and diegetic can happen

‘at a moment's notice, without in the least throwing into question the integrity of the diegesis’ (ibid).

The rat parade then reaches the cliff edge and the protagonist ponders the wealth he will receive when the rats plunge to their doom. Accompanying this sequence a low, ominous droning sound begins to build in volume, creating a sense of foreboding as to the fate that lies ahead for the rats. This is a good example of the way sound ‘vectorizes or dramatizes’ (13) a sequence, creating ‘a feeling of imminence and expectation’ (13-14). The sound of a bell tolling is heard, accompanied by the appearance of a bloody scythe on the screen, and then the comic transitions into displaying a series of surreal images of fine dining, wealth and high living. Alongside this visual transition comes a gradual change in the soundtrack from diegetic to non-diegetic, with the harmonica fading out completely to leave only the sound of the ominous, un-ending drone.

Hague asserts that digital comics with responsive soundtracks ‘require a relatively modular approach to the sound design’ (2014, 76). This modular approach can be heard at work in *Hobo Lobo*’s soundtrack, which essentially consists of a series of sound loops and spot effects, setup to play or fade in and out in response to the reader’s scrolling progression through the comic. While this approach draws heavily on the language of sound in film, the modular nature of its construction also invites comparisons to the use of sound in videogames. Nitsche identifies the use of ‘adaptive audio’ systems in games that offer ‘a dynamic change of a playing musical piece in relation to the user’s interaction’ (2008, 135). The resulting combinations of sound effects and music used in games create ‘navigable soundscapes’ (141). These act as flexible compositions where a ‘player’s spatial exploration is also a journey through a varying soundscape’ (ibid). As *Hobo Lobo* has shown, despite their modular nature these soundtracks are capable of many of the same evocative flourishes found in film and games. Indeed, Nitsche asserts that: ‘Elaborate soundscapes can build up a dramatic foreshadowing, provide direct acoustic engagement up to the climax, and mark an end with a cathartic aftermath’ (142).

Responsive soundtracks are an example of crossover between videogames and digital comics. The previous chapter examines in detail the potential for direct hybridisation between videogames and comics to create "game comics" that make use of the key characteristics of the form of comics in the mechanics of their gameplay. As part of the practice-based research documented in the previous chapter I created the prototype game comic, *Icarus Creeps* (Goodbrey 2013). Working on this game comic also gave me a new opportunity to experiment with implementing a responsive audible soundtrack in a digital comic.

Icarus Creeps is a hybrid between comics and adventure games. The player navigates the game comic via the use of the arrow keys on the keyboard, which move Icarus panel by panel around the world of the game. The comic features a responsive, non-diegetic musical soundtrack, influenced by the adaptive audio systems commonly found in adventure games. However, my initial intent with Icarus had been to create a more complex soundtrack, with elements of both diegetic and non-diegetic sound that would respond to the user's exploration of the environment and narrative progress. Ultimately, sourcing appropriate sounds and synching these to the player's actions proved to be a greater challenge than anticipated. To avoid significantly extending development time I opted instead for the simpler musical soundtrack, with changes in the soundscape aligned primarily to transitions between different environment types (such as from inside to outside, or outside to underground).

The Empty Kingdom

To enable further examination of the use of audible sound in digital comics I initiated a new period of practice-based research that resulted in the creation of the game comic prototype, *The Empty Kingdom*. The plot of *Kingdom* follows a videogame player who logs into an empty Massive Multiplayer Online (MMO) game, shortly before the MMO is due to be permanently closed down. Within the game world the player appears as a king, searching his empty island kingdom for

any sign of other players. The game is again controlled by arrow keys and plays similarly to *Icarus*, with the player moving the king from panel to panel through the different parts of the kingdom. While there are puzzles that can be solved in order to reach the narrative's conclusion, the emphasis in *Kingdom* is placed more on the act of exploration itself. My intent was to create an explorable space mediated through the format of an audible digital comic.

McCloud asserts that 'in comics at its best, words and pictures are like partners in a dance' (1993, 156), where each takes turns in leading the narrative. For audible sound to successfully join the multimodality of comics, it too must be given opportunities to lead. In *Icarus* I had begun by creating the comic and game systems before later beginning work on the soundtrack. In *Kingdom*, I began the creative process with the sounds themselves. Using the creative commons sound archive *Freesound.org*, I assembled a library of ambient territory sounds that evoked a range of different environments. From these I teased out an imagined geography in which the sounds could interrelate as part of an adaptive soundscape. Next I drew thumbnails of the landscape in comics form and from this guide created the final artwork, constructing and integrating the modular soundtrack as I progressed.

In a responsive soundtrack, synchronisation between sound and image relies on accurately tracking the progression of the reader through the comic. The "fidelity" of the soundtrack's response is linked directly to the accuracy with which this progression can be measured. An audible comic that groups panels on digital "pages" has a low fidelity of response, as it can only track the points at which the reader navigates from one page to the next. Changes in the soundtrack are therefore limited to these digital page transitions, meaning any loops of sound must match appropriately with all the panels contained on each page. To achieve a higher fidelity of response, the reader can be limited to viewing a single frame of the comic at a time, or be forced to click regularly to build up or change the composition of panels on the screen. Changes in the soundtrack can then be synchronised to the appearance of each new panel, allowing for spot sound effects to be used alongside loops of sound tailored more closely to specific image

sequences. However, as explored in Chapters Three and Four, this approach to panel display can erode key characteristics of the form of comics such as the spatial network and the simultaneous juxtaposition of images.

In *Kingdom*, the comic is divided into fixed, page-like compositions of simultaneously juxtaposed panels. Within these compositions the reader controls the position of the king, moving him from panel to panel using the arrow keys and triggering the transition to a new composition by moving him off the edge of the screen. In this way the king serves as an avatar for the reader within the environment being simulated in the comic and allows for a high degree of precision in the tracking of reader progression. This approach therefore allows for the retention of some traditional concepts of page layout while at the same time allowing for a very high level of fidelity in the responsiveness of the comic's soundtrack. From the practitioner's standpoint, it also necessitates a process of careful experimentation in order to successfully determine the variations in volume needed for each sound loop in each panel of the comic.

Groensteen asserts that in comics, text and image 'enter into an intimate, almost fusional relationship' (2013, 71). However, he also cautions that once other elements such as sound are added to into the multimodality of comics, 'it becomes much harder to achieve this perfect degree of integration: often, they remain disparate elements, aggregated but not fused, unsystematic' (71). In attempting to understand the fusion of comics and audible sound, it is helpful to consider the concept of 'synchresis', which Chion defines as 'the spontaneous and irresistible weld produced between a particular auditory phenomenon and visual phenomenon when they occur at the same time' (1994, 63). As Groensteen asserts, synchresis is problematized in an audible comic due to the conflict between the definite, measurable time of sound and the indefinite, abstract time of comics narration. The use of modular, looping and ambient sound elements in responsive soundtracks are one approach towards successfully achieving synchresis. Loops of audible sound, lacking definite beginnings and endings, can be more easily matched with the

indefinite sequences of fictional time that are created by the reader through the process of closure.

Kingdom primarily makes use of ambient loops in its responsive soundtrack, but it also contains some spot sounds that play at specific points in the reader's progression through the comic. To understand the approach taken in integrating these sounds, it is useful to consider Chion's concept of the 'synch point', which he defines as the 'salient moment of an audiovisual sequence during which a sound event and a visual event meet in synchrony' (58). Spot sounds are by their nature relatively short sounds of a definite length, designed to accompany a specific event or action within the narrative. Placing the synch point of a spot sound in an audible comic represents the hardest challenge to achieving synchresis, as it has the most potential to draw attention to the conflict between definite and indefinite time.

In *Kingdom*, my approach was to treat these synch points as occurring in the gutters between panels, rather than in the panels themselves. One example of this is provided by a section of the comic that includes a bird sitting on top of a rock, which flies away as the king approaches it. In this sequence the reader first sees the bird perched on the rock. Then, as the reader moves the king towards the rock, they hear but do not see the bird take flight. In the next panel the bird is then shown already in full flight away from the rock. Rather than conflict with the still images that make up this sequence, the spot sound is in essence synched with the imagined motion that the reader creates in their mind through the process of closure. This approach plays to the strength of audible sound to suggest unseen movements (Chion 1994, 12), without negating the role of the reader in mentally constructing the 'continuous, unified reality' (McCloud 1993, 67) represented in the panels of the comic.

Conclusion

This chapter has examined the use of sound in audible comics, both as an element

of navigation and as an integrated part of a comic's narrative. The integration of audible elements into the multimodality of comics may include either diegetic or non-diegetic sounds, with the former benefiting from the use of rooting objects to situate them within the diegesis. In audible comics sound may influence the pace of reading and potentially lessen reader control over their progression through the narrative. These issues can be addressed through the use of responsive soundtracks that link control and modification of audible sound directly to reader progression.

In addition to providing a theoretical framework for the study of sound in digital comics, the chapter has provided a practitioner's perspective on the challenges of creating audible comics. The modular, looping nature of a responsive soundtrack is sympathetic to the indefinite time of comics' narration and allows creators to draw tropes from film and videogames in the construction of their soundscapes. The fidelity of response in these soundscapes is determined by the precision with which reader progression can be tracked. A higher fidelity of response can complicate soundtrack creation, but also provides more opportunity for the use of spot sounds alongside looping elements of audio. In placing the synch point for such spot sounds in the gutter between panels, audible sound can support (rather than conflict with) the reader's role in constructing time and narrative within the form of comics.

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8. Conclusion

This thesis provides an in-depth examination of the impact of digital mediation and hybridisation on the form of comics. This concluding chapter presents a summary of the main findings of this examination. Firstly, it considers the success of the methodology and outlines the conclusions that can be drawn in relation to both the initial research questions identified in Chapter One and the key characteristics of the form of comics identified in Chapter Three. Secondly, it provides an account and evaluation of my original contributions to knowledge and practice. Thirdly, it identifies some of the main opportunities for further research and practice that have been raised as a result of my inquiry.

Summary of findings

In Chapter One I proposed employing a cross-disciplinary, practice-based methodology for the study of the digital mediation and hybridisation of the form of comics. This approach has been successful in allowing me to construct a critical framework of comic theory within which to analyse the operation of the form of comics. Through a process of informed outreach into relevant areas of media and games theory I was able to successfully deploy this framework and examine the impact of digital mediation and hybridisation on the form's operation. My study of this impact has been deepened and extended by the practice-based methodology employed during my inquiry. The prototype comics created as part of this methodology form a significant contribution to practice and serve to demonstrate the potential for the creation of new and novel types of comic that can result from the digital mediation and hybridisation of the form.

In Chapter One I also identified four main research questions. These questions, which have been central to my study as a whole, are as follows:

How are the key characteristics of the form of comics impacted by:

1. Digital mediation and extension of the comic page?
2. The challenges of architectural mediality?
3. Hybridisation with the ludic qualities of the videogame?
4. The integration of audible, time-based soundtracks?

To address these research questions I developed a model for the form of comics based on seven key characteristics. These seven characteristics are not intended to form an exhaustive list, but instead to offer a useful approach to describing and discussing the form of comics. While the operations of these characteristics are often tightly interconnected, the proposed conceptual division provides a useful set of lenses with which to analyse and discuss distinct aspects of the way comics operate when read. The resulting model is not intended as an exclusory summation of the form and as such it allows for the study of comic formats that do not demonstrate all seven characteristics. In brief summary, the seven characteristics can be described as follows:

1. **Space as time.** Comics use arrangements of images in space to represent arrangements of moments or events in time.
2. **Simultaneous juxtaposition of images.** Comics place images in spatial juxtaposition to each other, such that two or more images may be viewed simultaneously by the reader.
3. **Closure between images.** The reader of a comic derives time, meaning and motion out of sequences of static, juxtaposed images through the process of closure.
4. **Spatial networks.** Sequences of images form part of a larger spatial network of narrative and aesthetic interrelations that exists between all the elements in a comic.
5. **Reader control of pacing.** The pace at which the reader absorbs the information in a comic is controlled by the reader and determined by the pace at which they read and navigate the comic.

6. **Tablodic images.** The images in a comic exhibit qualities of the tableau, in that they are deliberately composed, framed and illustrated to represent key moments of narrative meaning.
7. **Word and image blending.** Although sometimes wordless, comics typically use a blend of words and images in spatial juxtaposition to convey meaning to the reader.

Chapter Four examined the impact of digital mediation and extension of the comic page on these key characteristics. A range of approaches to the digital mediation of the form were discussed, with a variety of different examples and formats of digital comic identified and analysed. As a result of this analysis, different types of digital comic were shown to place different characteristics of the form into greater or lesser emphasis. For example, digital comics using a 'guided view' (Iconology Inc. 2013) approach may display only a single panel of a comic at a time, preventing the simultaneous juxtaposition of images and limiting the ability of the reader to appreciate and navigate the larger spatial network of the comic. By contrast, zooming 'infinite canvas' (McCloud 2000a, 222) comics place all the panels in a comic's spatial network into a single, easily navigable plane, thereby emphasising this characteristic of the form.

The chapter also examined the extension of the comic page through the incorporation of animated elements. As animation is primarily time-based, its use in digital comics has the potential to disrupt the usual operation of the form, which typically uses the spatial arrangement of images to represent the passage of time in a narrative. In digital comic formats such as motion comics, the characteristic of space as time is replaced with time as time and the reader's control over the pacing of the comic is ceded to the animator. Digital comics that incorporate short loops of animation within their panels are less problematic. The looping nature of these animations mean that the progression of time in the comic's narrative is still established primarily through spatial arrangements of panels. As a result the reader remains in ultimate control over the pace at which they absorb and progress through the comic.

In Chapter Five the challenges of architectural mediality for the form of comics were considered. Context for this study was provided by an examination of the hypercomic which, although initially conceived as a digital format (Nelson 1974), has since been adapted for use in gallery-based comic installations (Gravett 2013, 131). Hypercomics combine the characteristics of the form of comics with the multicursal structure common to other types of hypermedia. In digital hypercomics that make use of hyperlinks between page-like groupings of panels, the non-spatial relationship between the linked groupings can diminish the fixed, spatial network that is usually characteristic of comics. Conversely, in hypercomics that make use of an infinite canvas structure of branching 'trails' of panels (McCloud 2000b), the spatial network characteristic is emphasised significantly.

To meet the challenges of architectural mediality, gallery-based comics can draw on approaches originally established for use in their digital counterparts. The cursality of hypercomics, which rely on readers choosing their own locally unique path through the spatial network, is sympathetic to the potential for more freeform exploration inherent to three-dimensional space. Techniques developed for use in infinite canvas comics can be successfully applied to architecturally mediated comics due to the large areas of continuous space available for panel layout on walls, floors and ceilings. For example, variations in the spacing between panels can be used to influence the reader's interpretation of the passage of time in a comic, while the relative position between the panels and the viewer can be used to create a variety of narrative effects.

One problematic aspect of architectural mediation is the potential impact it can have on the characteristic of word and image blending. The larger scale of some of the panel sequences employed in architecturally mediated comics means that at times the reader may have to turn their head to follow the entirety of a sequence. This introduces a discontinuity between the focussed reading of the words in a panel and the ability to easily apprehend the larger sequence to which the panel belongs. This aspect of the format means that wordless or 'silent' (Groensteen

2014, 107) comics can be better suited to architectural mediation than comics that employ a more standard word and image blend. Another possible approach is to present written elements of the comic's narrative as separate captions or blocks of text, so that the reader can consume them independently from the sequences of panels they accompany.

Chapter Six examined the hybridisation of the form of comics with the ludic qualities of videogames. This examination was practice-based and focused towards the creation of a series of prototype game comic hybrids. The chapter identified a game comic as a type of hypercomic that exhibits some of the key characteristics of games and uses some of the key characteristics of the form of comics as the basis for its gameplay. The spatial nature of the form of comics was also identified as providing potential for synthesis with the spatial characteristics of videogames. The resulting prototypes operate as narrative-driven 'games of progression' (Juul 2005, 72), with gameplay focussed around the exploration, construction or manipulation of the spatial network in each game comic.

Unlike a traditional comic, where the reader is free to determine how to interrogate and navigate the spatial network, game comics may place deliberate limits on how the reader views or progresses through the network. The level of 'agency' (Murray 1997, 126) felt by the reader as they control their own navigation of the spatial network within these limits is one factor that can point towards a more game-like experience. Comics that offer more game-like experiences may also feature a more regular dispersal of aporia-epiphany loops in which the player's progress through the network is deliberately gated, forcing them to pause and find the solution that will allow for further progression (Aarseth 1997, 90; Gazzard 2013, 103). In creating games comics, the design and implementation of these gates to progression can be challenging due to the complexity of interrelations that exist between the panels in a comic's spatial network.

As a hybrid format, game comics must strike a balance between working effectively as comics and being fun and engaging to play as games. This can be a difficult

balance for practitioners to achieve, as it requires drawing on design skills from two separate disciplines. The creation of a successful game comic may necessitate the simplification of some characteristics of the form of comics or some elements of gameplay in order to achieve a working balance between the two. In *A Duck Has An Adventure* (Goodbrey 2012a), the tablodic images in the comic were purposefully simplified to allow them to be quickly understood by the reader, allowing for a rapid and regular pace of interaction and progression through the comic. In *Icarus Needs* (Goodbrey 2013a), the collection and use of items to solve puzzles was simplified to require no additional input from the reader, so as not to interrupt the usual navigation of the comic's spatial network.

Chapter Seven examined the impact of the integration of audible, time-based soundtracks into the form of comics. The chapter established sound in comics as usually being imagined by the reader based on visual representations that use a combination of words, images and graphic devices to evoke different sound effects. In digital comics the multimodal nature of the blend of word and images can be extended to incorporate elements of perceived, audible sound. These audible sounds may be non-diegetic and exist outside the story world of the comic as accompaniments to the narrative of the comic or as part of the navigation process by which the reader traverses the spatial network. Alternatively the audible sounds may be diegetic in nature and directly integrated into the story world of the comic, often through the use of a visual element that acts as a 'root' (Cohn 2013, 35) for the sound within the story world.

Similar to animation, the use of audible sound in a digital comic may potentially challenge the reader's control of pacing. The tempo and length of a piece of music or a sound effect can influence the pace at which the reader progresses through a comic. The use of time-based audible sound effects of fixed duration can also conflict with the more 'indefinite' way fictional time is usually established in comics via spatial arrangements of panels (Groensteen 2013, 70). To address these issues, digital comics may employ responsive soundtracks that automatically adapt and synchronise themselves to the reader's pace of progression through the spatial

network. Such soundtracks are usually modular in their construction and make use of loops of audible sound that are faded up or down in response to the reader's position in the spatial network of the comic. Like the use of looped animations within panels, these loops of sound offer less conflict with the indefinite depictions of fictional time presented in the spatial arrangement of a comic's panels.

Responsive soundtracks allow digital comics to support their narratives using audible sound with similar approaches to those established in film and videogames. For example, 'territory sounds' can help establish the location of a scene (Chion 1994, 75), while sound that 'vectorizes or dramatizes' (13) a sequence can be used for foreshadowing or to build expectation in the reader (Nitsche 2008, 142). I explored the design and operation of responsive soundtracks through a process of practice-based research that resulted in the creation of the game comics *Icarus Needs* and *The Empty Kingdom* (Goodbrey 2014). Through an iterative cycle of creation, evaluation and reflection I developed an understanding of how the successful placement of audible sounds in a digital comic relates to the accurate tracking of the reader's locus of attention.

This fidelity of response in an audible comic's soundtrack is limited by how closely the reader's position in the spatial network of the comic can be tracked. Digital comics that use page-like groupings of panels have a low fidelity of response as they can only track the reader as they transition between pages. Digital comics that use guided view, panel delivery or infinite canvas approaches may exhibit a higher fidelity of response in their soundtracks. At high fidelities of response, responsive soundtracks can more easily integrate finite-duration spot sound effects synched to specific moments within the narrative. The 'synch point' (Chion 1994, 58) for a spot sound effect is best placed in the gutter between panels, so as to enhance rather than conflict with the reader's use of closure in mentally completing the action depicted in the panels.

Contribution to knowledge and practice

While academic study of the form of comics is a growing field, there has been relatively little examination within the field of the form's ongoing process of digital mediation. My thesis provides a comprehensive review of current literature and links this with a critical survey of digital comics practice. This survey takes in both the historical development of key digital comic formats and a full range of contemporary professional practices. My thesis documents the exploration of these ideas through my own design practice, which in turn fed back into the development of further theory. This integrated theoretical and practical inquiry forms a significant contribution to knowledge and practice within the fields of comic studies and digital comic creation. It will be of use to anyone studying the impact of digital mediation and hybridisation on the form of comics and serve as a guide to practitioners in identifying the practical implications of these theories for the design and creation of digital comics.

Through the analysis of the work of comics theorists and practitioner theorists my study counters the lack of a practical formal definition of comics by proposing a new model of the seven key characteristics of the form. This model is of potential use to anyone wishing to study or discuss the operation of the form of comics, from deep readings of specific texts to broader studies of how different types of mediation can impact on the way comics operate when read. The model offers advantages over previous exclusory definitions of the form by acknowledging that different examples or formats of comic may place greater or lesser emphasis on each characteristic. This allows previously-debated formats and examples of 'disputed boundary cases' (Witek 2009, 149) to be examined as comics, despite the absence of one or more key characteristics. The non-exhaustive nature of the model also allows it to be easily modified or expanded by future scholars to meet the specific requirements of their study.

My thesis contributes the first detailed history of the hypercomic, documenting the emergence and development of its formal qualities in digital media and its later

adaptation for use in architecturally mediated formats. By providing a historical survey of significant hypercomic works I also contextualise my own work as a pioneering digital comic practitioner. The large body of experimental and innovative digital comics that I have created over the course of my professional career form a significant contribution to practice within the field of digital comics. Amongst this body of work, my exploration of the potential of the hypercomic helped to grow the use of the format on the web and later in gallery settings. My work with zooming infinite canvas structures has been of particular significance. I created the first comic to employ a zooming infinite canvas interface (Goodbrey 2002) and later developed and released a toolset to allow others to easily create their own zooming comics (Goodbrey 2005).

Through the use of the practice-based methodology employed during my doctoral study I have extended my hypercomic practice with the completion of a number of significant new works. The gallery comic *Black Hats In Hell* (Goodbrey 2013b) was exhibited in Hatfield and London and featured in the book *Comics Art* (Gravett 2013) as a major example of the format. The game comic *A Duck has an Adventure* reached number six in the paid comic apps on *Google Play* (Goodbrey 2012b) and was a shortlisted entrant in the *New Media Writing Prize* (2012). The game comics *Icarus Needs* and *The Empty Kingdom* are innovative for their introduction of a new approach to videogame hybridisation in which the player directly controls the movement of an avatar in exploring the spatial network of a comic. This approach increases player agency and can allow for the use of page-like grouping of panels without reducing the fidelity of response in any accompanying audible soundtrack. As detailed in Chapter Six, these game comics also reached a substantial player base of online gamers, receiving a large number of review, response and playthrough videos on *YouTube* (2016a; 2016b; 2016c).

In conjunction with these practice outcomes, my doctoral study has also resulted in a number of peer-reviewed publications, including three journal articles and three book chapters. The full details of these publications are listed in Appendix C. The dissemination of both the practical and theoretical findings of my study has served

to further establish my standing within comic scholar and comic creator communities as a leading expert in the field of digital comics. An indicator of this standing was provided by the British Council, who invited me to speak on the subject of digital comics to visiting delegations of comic creators and publishers from Belgium in 2011 and Bangladesh in 2013. I was later invited by the British Library to curate a retrospective of significant British digital comics that went on show as part of the *Comics Unmasked* exhibition in 2014.

In Chapter Two I documented in detail my work to promote the study of digital comics through the presentation of papers and keynotes at major national and international academic conferences. A full list of these conference contributions is provided in Appendix B. Towards this goal I also proposed and edited two peer-reviewed academic journals themed around digital comics (Goodbrey 2015; Goodbrey and Nichols 2015) and in 2015 organised the first English-language digital comic symposium, *The Comic Electric.* The symposium was held in conjunction with the NESTA funded *Electricomics* project (Electricomics CIC 2015), with whom I have worked as a research partner and consultant parallel to my doctoral study. The project has proved successful in raising the profile and potential of digital comics amongst both comic creator and wider arts communities, with the Electricomics app being ranked by *The Guardian* in the top 25 iPad apps of 2015 (Dredge 2015).

Opportunities for future research and practice

As the media that support the form of comics continue to develop and change, comic creators will continue to respond and adapt their work to take advantage of the potential of new platforms and emerging comic formats and audiences. During the course of my study into this ongoing process of mediation and hybridisation, I have identified three major areas for future research and practice.

1. Additional hybridisation within architecturally mediated comics.
2. Game comics that operate as games of emergence.
3. Augmented and virtual reality comics.

The first area forms a continuation of the inquiry into architecturally mediated comics documented in Chapter Five. In the practice-based inquiry that centred on the creation of *Black Hats In Hell*, opportunities for additional hybridisation in architecturally mediated gallery comics were considered as being outside the scope of the study. Further research is therefore needed in order to understand the impact on the form of any such hybrid elements.

These elements could include the use of screens or projected images to allow for the integration of video and animation into the spatial network of an architecturally mediated comic. Similarly, elements of audible sound could be triggered to play at certain points in the narrative through the use of sensors to detect the reader's presence in specific areas of the gallery. Three-dimensional sculptural panels could also be employed, and these might incorporate kinetic or physically interactive elements. The parallels between digital comics and gallery comics identified in Chapter Five could potentially be further extended through the study of these additional hybrid elements. For example, the incorporation of sound and video elements into a gallery comic may have similarities with the use of sound and animation in digital formats.

The second area of opportunity for future research and practice comes as an extension of my research into the hybridisation of videogames and comics. The practice-based inquiry detailed in Chapter Six focussed chiefly on game comics that operated as games of progression. These games were noticeably successful in term of their reception by a predominantly "gamer" audience. The potential exists to also create game comics that operate as 'games of emergence' which feature 'a small number of rules that combine and yield' a large number of different variations of play (Juul 2005, 73). These rule-based games could feature comic narratives

constructed generatively as a result of the play of one or more players attempting to achieve a variety of different winning outcomes.

Although primarily progression-based in terms of its puzzle-focussed structure of play, the game comic *Margaret Must Succeed* (Goodbrey 2013c) featured a more generative approach to narrative than the other prototypes created during my doctoral study. The difficulties encountered in implementing this generative narrative points towards some of the potential challenges involved in creating game comics that operate as full games of emergence. The complex range of interrelations that exist between the panels in a comic's spatial network can lead to generative comics requiring significantly higher workloads in terms of narrative and gameplay design, coding and art asset creation. They may also require different strategies of reading and play in order to be understood and enjoyed by their audience.

To more fully explore the operation of the form of comics in emergent game comics, further research is needed. To pursue this research using a practice-based methodology, the scale of work involved would make it advantageous to work as part of a larger development team. Given the timescales involved in their creation, the existing prototypes made as part of this doctoral study were by their nature relatively short in terms of their total gameplay time. From a practice standpoint, a larger development team that draws from a talent pool of both comic and videogame creators would allow for the creation of richer, more complex and longer-form game comic experiences.

The third area for future research and practice concerns the potential offered by augmented and virtual reality for the creation of new formats of comic. When viewed through an augmented reality (AR) device such as a smartphone, real-world environments or objects can be visually augmented with additional computer-generated elements. Currently AR is commonly used by comic companies like Marvel to add overlays of additional making-of and worldbuilding material to printed comic books (Marvel 2016). This information is typically provided in video

or textual formats; there has been little exploration of the potential to display new content through AR panel sequences that extend off the page, or of the use of AR to integrate sequences of panels into existing real-world environments. Virtual reality (VR) refers to a more fully immersive computer-simulated three-dimensional environment or surround-video that is typically viewed through some form of VR headset. At present VR has been relatively little used in connection to the form of comics, although some examples have begun to emerge of digital comics that have either been created or adapted for reading via VR devices (Oniride 2016; Madefire 2016).

Both AR and VR are increasingly accessible technologies for the creation and consumption of media artefacts. Further research is needed in order to explore the different ways these platforms can be used in conjunction with the form of comics. This inquiry would examine the kinds of story that AR and VR can be used to tell, and how these uses may impact on the key characteristics of the form. Like the study of generative game comics, pursuing this research via a practice-based methodology may require collaboration with a larger development team in order to access the requisite range of design and technical skills. While such an investigation was outside the main scope of my doctoral study, approaches to the navigation of the spatial network and audible sound design in virtual comic environments may draw on ideas discussed in conjunction with the hybridisation of comics and videogames. Similarly, theories concerning the mediation of comics in three-dimensional architectural spaces may be of relevance to the placement and reading of panels in augmented and virtual environments.

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Appendix B: Conference Papers

Goodbrey, D. (2011a) 'Digital Comics: New Mutations & Innovations.' In paper presented to *Comics Arts Conference,* San Diego, 21-24 July

—— (2011b) 'Game Comics: Read or Play?' In paper presented to *Transitions 2: New Directions in Comics Studies,* London, 5 November.

—— (2011c) 'Digital Comics: News Forms & Innovations.' In paper presented to *Comics Forum 2011 - Materiality and Virtuality: A Conference on Comics,* Leeds, 16-18 November

—— (2012a) 'Distortions in Spacetime.' In paper presented to *Contemporary Screen Narratives Conference,* Nottingham, 17 May.

—— (2012b) 'Digital Comics – New Tools and Tropes.' In paper presented to *The Third International Comics Conference*, Bournemouth, 28-29 June.

—— (2012c) 'From Comic to Hypercomic.' In paper presented to *EUPOP 2012,* London, 11-13 July.

—— (2012d) 'From Comic to Hypercomic.' In paper presented to *The Graphic Novel - First Global Conference,* Oxford, 7-9 September.

—— (2013a) 'Comics Are Control: The Importance of Pacing and the Role of the Reader.' In paper presented to *Adventures in Textuality: Adaptation Studies in the 21st Century,* Sunderland, 3-4 April.

—— (2013b) 'Game Comics: An Analysis of an Emergent Hybrid Form.' In paper presented to The *Tablet Symposium: Examining New Media Objects,* Brighton, 10 April.

—— (2013c) 'Game Comics: An Analysis of an Emergent Hybrid Form.' In paper presented to *Change and Continuity - Interdisciplinary Aspects of Animation, Comics and Literature,* Stuttgart, 25 April.

—— (2013d) 'Game Comics: An Analysis of an Emergent Hybrid Form.' In paper presented to *Joint International Graphic Novel and IBDS conference,* Glasgow, 24-28 June.

—— (2013e) 'Images in Space - The Challenges of Architectural Spatiality in Comics.' In paper presented to *The Graphic Novel – Second Global Conference,* Oxford, 22-24 September.

—— (2014a) 'The Sound of Digital Comics.' In paper presented to *The Digital Reading Network Symposium*, Bournemouth, 19 June.

—— (2014b) 'The Sound of Digital Comics.' In paper presented to *Transitions 5: New Directions in Comics Studies,* London, 25 October.

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Appendix C: Peer-Reviewed Publications

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