Previsualization in Computer Animated Filmmaking

THESIS

Presented in Partial Fulfillment of the Requirements for the Degree Master of Fine Arts
in the Graduate School of The Ohio State University

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The Ohio State University
2012

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Abstract

Previsualization (previs) is a pre-production process that uses 3D animation tools to generate preliminary versions of shot or sequences. This process is quickly gaining popularity in live action film, and is beginning to be used in animation production as well. This is because it fosters creativity by allowing for designers and artists to experiment more freely and intuitively with visual design choices, and insures efficiency in production and post-production. Previs is also able to provide a means to communicate and test plans visually in the pre-production stage which enhances clarity and understanding.

The intention of this thesis is to make available information about previs that is, for the most part, unpublished or unknown by all but those already deeply involved in the process, and to explore and document the application of a previs process of my own in the production my first short film.

To begin I will describe the previs process from several perspectives. Previs will be presented in historical context in order to provide insight into its development. Next I will present the results of an industry professionals survey conducted in late 2011 and early 2012 as a way of revealing an insider’s viewpoint on the use of previs in commercial computer animation production.

A major element of my study in previsualization has been the production of a short film. Following the industry survey results I present an analysis and reflection of
my own experiences in making my short film, *Wonder*. By comparing my process to the process as described by the surveyed professionals, I write in depth about the process of making *Wonder*, and how previs was used in this context.

The concluding chapter is used to present the analysis and to summarize the information I have gathered through interviews and practice. From my experiences, I will present my observations and describe new ideas that have since been developed in the course of this work.

It is my intention that this information will serve to document a particular moment in the state of the art of previs (early 2012) in light of the rate at which previs is growing. However, I feel that this snapshot will serve as a starting point for those who might want to learn more about this uncelebrated piece of the animation practice, whether they are students, educators, collaborators or simply interested in the topic.
This document is dedicated to my mum.
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Chapter 1: Introduction

Project Focus and Scope

As an artist, I most identify with the title of “storyteller.” In the works that I create, I like to shape worlds, define characters, explore motives and emotions, tinker with expectations and occasionally wax philosophical. However, I sometimes find myself at a loss for words, unable to properly say the things I am thinking. How do I allow a story to seemingly unfold naturally in front of an audience, when in fact I am carefully planning each shape and image and movement? How do I make sure the meaningful content of the story is expressed without spoon-feeding it to the viewer? Is it possible to test, experiment with and plan creativity? What about the reactions to the story?

Setting a concept down on paper allows a filmmaker to begin composing the story, plan timing and composition. In terms of storytelling, storyboards have traditionally been the most useful tool in the filmmaker's toolbox. Storyboards are individual drawings used sequentially to visually describe a thought or idea. As technology and filmmaking methods have evolved in both live action and animated film, so too has concept development or ‘pre-production’ methods. Pre-production is the period in filmmaking that is prior to production. It is a time in which a crew prepares and plans all the elements needed to create the film which are used during ‘production.’ Previsualization (previs) is a method of pre-production concept development that “generates preliminary versions of shots or sequences, predominantly using 3D animation
tools and a virtual environment. It enables filmmakers to visually explore creative ideas, plan technical solutions, and communicate a shared vision for efficient production” (The Previsualization Society, 2009)

To me, previs is more than 3D animated storyboards. It’s more than a way to get technical data and camera information early. It’s a sandbox. It’s almost like bringing the scientific method into creativity. An artist can build a world, and if it doesn’t work, if it doesn’t tell the story they want to tell, they can break it down and build it again. They can alter the world, and they can alter the viewer’s perceptions of that world and the story within by experimenting and testing each and every idea that they come up with. And if those aren’t suitable, they can turn the thought-process outward and explore their space, using discovery as a creative planning tool.

Previs is quickly gaining popularity in live action film, and is beginning to be used in animation production as well because it fosters creativity by allowing for designers and artists to experiment more freely and intuitively with visual design choices, and insures efficiency in production and post-production by providing a means to communicate and test plans visually in the pre-production stage which enhances clarity and understanding. Previs has become such a standard part of pre-production in many films that there are now companies such as Persistence of Vision and The Third Floor that specialize in just previs.

Because previs is still a relatively new addition to film pre-production, and therefore is still evolving at a rapid pace, there is no clear-cut, standard set of rules for using it. This is recognized by the community of practitioners at large, evidenced by the
formation of the Previsualization Society in 2009 with the intent of providing an “ongoing platform and resource devoted to the development of previs to maximize its value and effectiveness for many people and markets. Previs has matured but it is also still evolving… The Previsualization Society will take up such key work as publishing standards, promoting education and providing useful tools for the challenges of previsualization.” (Why was the Previsualization Society formed?, 2009)

The intention of this thesis is two-fold; to make available information about previs that is, for the most part, hidden from or unknown by all but those already deeply involved in the process, and to explore and document the application of a previs process of my own in the production my first short film. The creation of a short film is in order to discover how an independent animator might use previs techniques, as opposed to a large or even medium-sized studio. It was also a way to experience and therefore understand what, exactly, the benefits are for using previs over storyboarding and other more traditional pre-production planning techniques. I will also be exploring the parameters of previs. Where in the pre-production process does it begin, and at what point does this process turn away from previs and become production? Are previs techniques still viable even into production, or is previs only used in pre-production?

In this paper I will describe the previs process from several perspectives. Previs will be given historical context and explained from the point of view of people who work with it closely, including the industry professionals who responded to a set of questions regarding their studio’s use of previs. I will also include my own experiences in making my own short film, Wonder, compared to the process as described by these professionals.
I expect that this information will serve to document a particular moment in the state of the art of previs (early 2012) in light of the rate at which previs is growing. However, I feel that this snapshot will serve as a starting point for those who might want to learn more about this uncelebrated piece of the animation practice, whether they are students, educators, collaborators or simply interested in the topic.

Professionals Survey to Discover Previs Methodology and Techniques

As a first step, I created a professionals survey to sample how previs is currently used in commercial 3D animation production. I limited my survey to 3D animated filmmaking, because this is the media with which I am working and most interested. There is a good deal of existing documentation of the use of previs in live-action film, compared to relatively little in animation, which is still relying very heavily on traditional methods developed for working on 2D animated films. In the survey, seven industry professionals from varying areas of expertise responded to pre-established questions around methods and techniques of previs. Respondents included professionals working in large feature animation studios such as Blue Sky Studios and Dreamworks Animation Studios, studios that specialize in previs like Persistence of Vision, or visual effects studios like Industrial Light and Magic and Rhythm & Hues Studios. Some of these professionals work very closely with previs, and others more indirectly, but their work is affected by previs. Through this survey, I wanted to learn what is being done right now among professionals using previs in 3D animation, and how their methodologies (underlying system and rules of organization of procedures) and techniques (specific
technical procedures) may differ. I conducted the survey over the course of a month in the winter of 2011, and received the responses in late 2011, and early 2012.

At this time, I was already part way through making my animation, which meant I was in the interesting position to compare their responses to the ways I was discovering and working on my own. This also allowed me the opportunity to learn from and incorporate their methods into my own process where I felt I could.

Independent Filmmaking Project: *Wonder*

The second aspect of my thesis was the creation of a short animation in which I assume all the roles of filmmaking. This paper focuses on one aspect of my filmmaking process, which is my use of previs techniques. I am a newcomer to computer animation and have much to learn not only about the technicalities, but also defining my own process and finding my strengths and weaknesses. In the third chapter, I will be writing in depth about the process of making *Wonder*, and how previs was used in this context. By making my own piece, I intend to address the following questions:

1. How does working with low-poly models of sets and characters early on in the process affect my visual design choices, especially cinematography? Am I more imaginative or do I feel lost by not having the decisions locked down in the storyboarding stage?

2. Working as an independent animator, how can including previs in my process be used as both a planning tool, and a tool to explore and discover new creative possibilities?
3. Where does previs make itself most useful for me? Where doesn't it?
4. Where might previs impact my work beyond pre-production?

Analysis and Summary

The concluding chapter will be used to present the analysis and summarize the information I have gathered through interviews and practice. From my experiences in making my film and in collecting professionals’ responses to my survey questions, I will present my observations and new ideas that have since been developed. My initial reactions to topics such as how previs can simulate live-action shooting, how it allows for creative experimentation and the ability to be quickly iterative.

I will also be addressing the initial questions that I have been asking throughout this chapter and elsewhere in the paper. In addition to these questions I will discuss observations I have made about how previs techniques can be continued into the production process, even after previs has ended, and the differences and similarities in how previs is used by both independent animators and commercial studios. I will also address some of the resistance in the professional field to previs.

Finally, discuss what next steps I see for myself as an artist, and how previs might be developed in the future based on my observations through extrapolation of currently used techniques, what I would like to see as a practitioner, and comments given by industry professionals.
Chapter 2: Previsualization and Industry Professionals Survey

What is Previsualization?

Previsualization (previs) is part of the pre-production process in both live-action and animated film-making. The main function of previs in large studio productions is to visualize complex scenes before they go into full-scale production by planning sequences visually. The modern usage of the term “previs” usually implies doing this digitally with 3D animation software, though in concept, storyboarding can easily be considered part of the previs process. Previsualization by large studios gives the advantage of including exploration and discovery in the planning toolkit, as well as providing a blueprint that more easily communicates ideas across many departments and individuals, including technical data.

Because previs is a rapidly growing and evolving process in the industry, I felt that it was important to ask professionals to describe what is being done with previs currently in each of their studios, how it is impacting their creative process, and what they envision for its future. In this chapter, I will present some of the results of these interviews, which included these practitioners from the following major animation studios:

- Rob Cardone, Head of Camera & Staging, Blue Sky Studios in Greenwich Connecticut.
- John Doublestein, Lead Creature Technical Director [creature TD], Industrial Light and Magic.
- Will Kistler, Character Animator, Rhythm & Hues Studios.
- Tyler Kupferer, Previs Artist, Persistence of Vision.
• Jacquelyn Piette, Lighting Artist for feature animation, Lighting Technical Director for live-action film. She currently works freelance.
• Kent Seki, Director of Previsualization, Dreamworks Animation Studios (currently working on Mr. Peabody and Sherman).

The full transcript of the questions and responses are contained in Appendix A, Interview Responses from Industry Professionals about Previs.

Historical Context of Previsualization in the Production Process

Previs can be described as the logical progression of visual planning techniques that began almost immediately after the medium of film was invented. Though the earliest planning technique, storyboarding, has existed in some form or another since the silent era of filmmaking, it was at Disney Animation Studios in the 1920s and 30s that it gained its name and standard practices. John Canemaker, in his book Paper Dreams: The Art and Artists of Disney Storyboards (1990, Hyperion Press), explains that the first storyboards evolved from comic-book like “story sketches” created in the 1920s to illustrate concepts for animated shorts such as Steamboat Willie. In The Art of Walt Disney (Abrams, 1974) by Christopher Finch, Disney is said to have credited animator Webb Smith with creating the idea of drawing shots on separate pieces of paper, and then pinning them in sequence on a bulletin board to tell the story, thus creating the first storyboard. Within a few years, other studios followed, starting with Walter Lantz Productions in 1936. (Thomas, 1936) Before long, all animation studios were using storyboards.
Storyboarding is almost always used in filmmaking and has been since very early in the history of the medium. How it is used and in what amount of detail varies depending on the director. Alfred Hitchcock has famously been known to be able to visualize his films so completely that he considered the actual shooting process to be tedious. He would create extremely thorough storyboards (figure 1) comparing the storyboards to the actual shots in *The Birds*, and camera plans that he would use to communicate his vision of the film to others. (Ferster, 1998)

![Figure 1 – Storyboards from *The Birds*, drawn by Harold Michelson, compared with the final shots of the film.](image)

As invaluable as storyboarding is to the filmmaking process, there are advantages previs can give that storyboards are incapable of accomplishing. Storyboards are still the
The best way to visualize an idea quickly. They are easy to understand by most industry professionals, inexpensive to produce, depict character expression well, and drawing is a very immediate process. However, drawings are static and do not communicate time and movement well. Storyboards require precise notations of camera movement and timing. 3D previs, meanwhile, while lacking in character expression and more time-consuming to set up than a drawing, is able to show movement and timing the way storyboards cannot. Previs can be used to precisely display camera angles and focus information, and pre-built sets in 3D can be explored and new shots can be discovered and tested quickly. Camera experimentation and exploration is difficult to render in storyboard format.

It has not been only recently that these disadvantages of 2D static drawings were known. Disney experimented with other prototypes of previs, including building miniaturized sets, viewed with a small optical tool called a “periscope,” which had deep depth of field capabilities and was used to explore camera angles. Separate from using miniature sets was another technique, a process which came to be known as a “Leica Reel,” (Ferster, 1998) named after the type of cameras that were used to create them. This precursor to what we now call an “animatic” was created by filming the storyboards, which were then edited and arranged with recorded material such as voice acting and music. The animatic technique used today is very similar, made by editing still images together into a computer and accompanied by a rough soundtrack and/or dialogue. There can also be simulated camera moves such as pans and zooms to give a better idea of the camera blocking. Both techniques allows filmmakers to plan their shots with all the timing included, making communication of ideas even easier.
In the 1970s, as video cameras and editing tools started becoming more and more affordable agencies began using animatics to pitch television commercials and guide production. The mid-70s saw another advance in the use of previs techniques for feature films in the making of the first of the original three *Star Wars* films. Introducing innovating, low-cost solutions to pre-planning complicated effects sequences, George Lucas, working with effects artists from the then-fledgling Industrial Light and Magic), used footage from dogfights in WWII, edited together into a template to previs space battle sequences. The miniature set technique originally developed by Disney would be replicated by attaching toy figures to rods and filming the tiny sets like the speeder-chase sequence through the forest in *The Return of the Jedi* as the figures were manipulated. (Katz, 2005)

These early techniques, however, were mostly used to plan complicated camera or effects-heavy sequences. Even today, effects-heavy sequences are more commonplace for previs than anywhere else. But this was not the case for every filmmaker. One of the most comprehensive users of previs techniques utilizing new technologies was Francis Ford Coppola. While making the 1982 musical film *One From the Heart*, Coppola developed a process he called “electronic cinema.” Using radio-drama style voice recordings of the script, along with extensive storyboarding (over 1800 frames), he created an animatic of the entire film. As production began, Coppola would use state-of-the-art video editing equipment to composite or replace the animatic footage with the actual film footage, filing in the missing pieces and giving a visual record of production as it was completed.
Even Coppola’s innovative techniques relied on analog video technologies. Digital previs was first used by David Dozoretz, an artist at Industrial Light & Magic, to create an entire sequence for the 1996 film *Mission: Impossible*. Dozoretz, who at the time was working at Industrial Light and Magic, explains that they were planning on a sequence in which a train pulls a helicopter into the Channel Tunnel. “The studio wasn’t really sure about it, so we all decided to do a rough computer animation to show what it can look like,” Dozoretz says. (Caranicas, 2012) This eventually led to George Lucas hiring Dozoretz for the *Star Wars* prequels, which became another previs first, a previs artist working directly with the filmmaker rather than the visual effects supervisor. (Frankel, 2009)

In contemporary live-action filmmaking, previs is used mainly in scenes that involve stunts and special effects, or require filming in elaborate sets that require complicated maneuvering of equipment and complex camera movements.

Previs is a way for directors to experiment with different cinematography and staging options without the cost of full production. Mat Beck, a visual effects supervisor on projects including *Spider-Man 2* says that previs’ greatest asset is that it enhances the director’s creativity, enabling experimentation to be tried out in the computer “before marching the entire army across the battlefield. You only commit big resources once you’ve honed your vision to something that’s cost effective and doable.” (Frankel, 2009)

Until recently, previs was confined to large-scale projects with lots of visual effects because of their already inflated budget and because until fairly recently, the
studies doing the visual effects were also the only ones doing previs. But the techniques are beginning to migrate into lower budget film production. (Frankel, 2009)

Advances in Animated Feature Previs

While previs has become a significant trend in live-action filmmaking, it appeared to me that there was less evidence of the advances being made with previs in the animation field. Almost all of the information I was finding about previs in filmmaking was about large budget, special effects heavy blockbusters. With roots in storyboarding and animatics, the forbearers of modern digital previs, it came as a bit of a surprise that the newest advances appeared to be passing animation studios by. But was this impression really true? I found that it would be a mistake to believe that there have been no advances, or that all animation studios rely solely on traditional pre-production methods. Like live-action, previs enables an animation filmmaker to plan, for example, action sequences that would be difficult to accomplish in a drawing. Camera angles and movement, shot timing, complex intercutting, all become more accessible with 3D tools.

James Williams, head of Sony Pictures Animation, explains that “the outstanding difference between previs in live-action and animation is that the animation process actually requires the layout, so that the raw materials [such as set pieces and camera blocking] within the layout process are utilized by animation and lighting and all the other departments down the road.” (Desowitz, 2006) Williams is referring to the layout as a sort of map, with all the assets as if they are landmarks set in place, ready to be used by every department in the studio to ensure consistency and continuity in the animation. In
order for each department to get their work done simultaneously, they each need to refer to the same plan, or map. This map is built by the layout team.

Differing Approaches to Previs in Animated Film by Studios

“Layout” in animation is generally referred to as the process in pre-production in which sets were built, defining scale and location. In many studios, the layout process has evolved to a point where it is now nearly indistinguishable from the previs process used in live-action films – both having influenced the other. In some cases, “layout” and “previs” might be two separate processes, and each studio seems to have different ways in which these processes are used. Some still rely on more traditional pre-production methods, like storyboarding, very heavily. This is often especially true in older studios, where many of the leaders come from traditional, 2D animation backgrounds. At Pixar Animation Studios, for example, previs is different for each feature, depending on the needs of the director. Explains Andy Jimenez, co-director of the short film One Man Band, “We’re trying to find the fine line between doing all the work in story and shielding the story process from all this other technical stuff. But once the story is locked, then we want to open the floodgate and utilize all this previs camerawork that we’ve done.” (Desowitz, 2006) From Jimenez’s description, it appears that for Pixar, there is an effort to prevent the story from being caught up in the previs process. They want to make certain that the story is solid, and will remain unaffected by the visual and technical decisions that are made during layout. Other studios, while still using storyboards, may have much more elaborate previs set-ups which they heavily rely on. Director Chris
Wedge at Blue Sky Studios says “All the action sequences in *Robots* were prevised instead of drawn. This was fun for everybody: the previs artists (who were primarily animators) could have fun finding cool shots, and editorial could play with different cuts of ‘existing footage.’ The director, of course, gets to say: ‘That’s cool – now try it this way.’ All in all, we are using previs for action and camera. Nothing sells character in the reels like well-done drawings.” This statement very succinctly summarizes what could be considered the main strengths and weakness of previs in animated film. For the artists, previs is a wonderful exercise in creativity. They are able to plan and experiment with and discover shots and sequences, and can have a great deal of impact on how the story is told. The editor is able to use live-action filmmaking techniques to cut the animation, by having extra footage there is the ability to cross-cut and experiment with different versions. The director isn’t required to settle for one version, and can ask for different ideas or stretch the imagination further than might have been possible without the flexibility that previs offers. And, noted by many industry professionals, the main weakness of previs is that it is unable to depict facial expressions – storyboards are still the best way to describe emotional scenes.

Sharing Live-Action and Animated Filmmaking Techniques in Previs

The approach currently being taken to previs in 3D animation is becoming increasingly more influenced by the approaches developed for the use of previs in live-action film making. “The big difference between live-action and animation is [in animation] that we storyboard and storyboard until we’ve got every scene exactly worked
out. It’s locked down compared to live-action, where they shoot 20 takes of the same scene and then use cross-cutting to come up with something unique. That’s the pure genius of filmmaking. And we’ve never really been able to do that in animation until now. Using previsualization – which we call animatics – we’re now getting to the point where we’ll shoot what’s indicated in the storyboard, but then we’ll give the editor an intercut or a couple of different angles. By giving editors the opportunity to cross-cut, they can create something with a real live-action feel to it.” (Wolff, 2003) In many ways, animated filmmaking edits the film before it starts shooting. It is expensive and time consuming to create and render any excess footage outside of previs. This approach allows for flexibility in the storytelling process to extend beyond the storyboarding stage. While previs is often – and rightly so – touted as a way to pre-plan shots and entire sequences before production even begins, this ability to behave like live-action filmmaking gives a lot of the storytelling power, the creative decisions, back to the editor.

The idea of using editing in pre-production in the same way as a live-action cinematographer is a relatively new concept in animation. The camera can be moved relatively easily, multiple takes can be shot, different versions of the same sequence can be made without spending the time animating everything again. With layout already an essential part of pre-production in animated film, filmmakers can take advantage of the included strengths, such as flexibility, experimentation and extra footage. Many of the same reasons why live action film making is turning to these previs tools in pre-production, such as exploring cross-cutting and angle possibilities, is also applicable to 3D animation. When asked if the use of 3D previs made shot choices in animated
filmmaking more live-action cinematography, Steve Martino, director at Blue Sky Studios, said “Definitely, more like live-action in the way that we shoot an event from multiple camera angles and build a sequence with editorial choices. Historically, in animation we have worked very hard to make our cameras feel more like live-action camera work by paying close attention to the physical limitations of shooting in the ‘real world.’ We have done this so that the audience feels that what they are experiencing in the digital world is real. At the same time, live-action directors have been pushing the envelope with camera technology that allows them to move the camera in ways never seen before. The gap is closing between our two production methods in regards to what is possible. We have also seen live-action directors take a spin in the world of animation and within a digital world where there really are no practical constraints to how or where you move the camera and thus we’ve seen the language of the camera push even further. All that is to say that the cinematography in live-action and animation are breaking through old boundaries and the previs process is a big part of discovering these breakthroughs.”

Cinematography in general is a central aspect to previs. In animation, previs began as an extension to the layout process, which is the point of pre-production in which sets are planned and built, and the camera work is staged. A previs, or layout, artist must therefore be very skilled and experienced in cinematography. Composition, lighting, framing, aspect ratios, camera focus, all essential parts of cinematography are planned during the previs stage of pre-production. Even in its most simplified form, the camera work is the essential and main objective to previs.
An explanation for why animation filmmakers would try so hard to emulate a physical camera is that film has developed a language. In the same way that we understand periods and spaces and quotation marks to have very specific meanings, certain conventions of camera work and editing also have specific meanings or standards. Editing is often called “the invisible art,” because the goal of many films is to engross the viewer into the story of the film, and not to distract with the camera work, the idea is to be unnoticed. After over one hundred years of watching films, the vernacular is almost second nature to us, and we have certain subconscious expectations. When a filmmaker chooses to go outside this set of standards, it is with the expectation that the audience will notice, and therefore is reserved for important shots or scenes. Most of this film language was established before the digital age, and are representative of what is capable with physical cameras. Animators are certainly aware of this language, work within its set of rules, even though a virtual camera is not confined to the physical limitations of the real world. On the other side of the coin, with the digital tools now available, live-action filmmakers are now able to create camera movements and edits that were unavailable when the language of film was being established, so old conventions are challenged and new ones being written, sometimes borrowing from experiments in the animation field.

The potential for a virtual camera is vast, and with previs the ability is there to encourage filmmakers, particularly in animation, to experiment with pushing beyond the standard boundaries of traditional film language and developing new and exciting examples that take advantage of the fact that a virtual camera is not bound by the rules of physics and reality.
Previs Finding a Place in Animated Feature Filmmaking

Experimenting outside of what was locked down in the storyboarding process would not likely have been in consideration a few years ago, due to concern about the time the experiments might take and the resources (mostly time and money due to increased worker hours) that were required. If it takes a significant amount of time and resources to build and model a full scene complete with props and characters, certainly it can seem questionable that a central aspect of previs is to, rather than shorten that process, do it twice. Admits Terry Moews, head of layout on *Chicken Little* and *American Dog*, “[on *Chicken Little*] there was very little previs to speak of because we were just concerned with getting the first production off the ground. Even then previs was definitely production oriented. We would be given a sequence, but it wasn’t within the context of playing with an idea of wanting to prove out this set.” (Desowitz, 2006) This idea that previs takes too much unnecessary time out of the production schedule, and is there simply as an addendum to storyboards instead of being there to give more time to experiment, seems to be changing over time. Animated filmmakers, rather than adding new processes, expand on already existing ones (such as layout), adjusting as they discover what helps the most, and where previs fits into an already existing pipeline. For Blue Sky Studios, this means treating one department as a central hub that is revisited again and again through pre-production and even into production. With each pass, Camera & Staging is sent the latest updates in order to adjust the camera work and distribute their own updates to the other departments. For other studios, this can mean
something as simple as the layout teams beginning their work early on in pre-production, working closely with the story and art departments as they develop the visual style, rather than simply translating already established storyboards into 3D.

Extending the Previs Process in Animation

As previs becomes more and more prominent in animation studios, production teams work to find the right balance between traditional and modern, digital methods. The permutations in technique are as many as there are studios. Differing backgrounds, experiences, values and perceptions all work together to find a model that best encompasses the goals of a particular studio or project. When exploring what role previs plays in various production processes, industry practitioners offered their experiences and insights.

In some cases, such as at Blue Sky Studios, previs plays an extensive role. Previs in these cases, in addition to being connected to the layout and camera developments stages, also acts as an extension to the story process. Instead of waiting for the story department to completely finish with their final pass, previs can jump in much earlier, somewhere in between the first pass and when layout begins working on the low-resolution sets. Steve Martino, director at Blue Sky, adds that this previs process differs from the steps that are taken in the other departments. “The primary difference is that the more stringent technical requirements for models and sequence construction within the scene files in MAYA are minimized, which allows the previs artist [to] work more nimbly to generate camera ideas. Models are made to scale, but are lightweight and
modular so that the previs artist has more freedom [to] create and experiment with camera choreography.”

Rob Cardone, Head of Camera & Staging at Blue Sky Studios, explains his department’s process in terms of phases. Camera & Staging is related to, but not completely part of, the previs process. It can be used to give an idea of the structure of the previs process at Blue Sky. The first phase is the Initial Camera and Staging Phase. During this phase, the cinematography of the film is planned. Cardone adds that the previs artists work very closely with the director and “establish a shooting style for the film.” They also work on planning the lighting direction so that they can ensure a clear read of the characters in each shot. “The choices that are made here will affect the mood… and greatly influence the audience’s perception of the action, the story and the film.” What Cardone describes as the second phase, the Final Camera & Staging Phase, is when the low-resolution set is replaced by a set that has been officially designed, modeled and set-dressed, including all the assets and props. At this point, the process ceases to be truly previs, as it has moved from pre-production to production. During the second phase, Blue Sky will evaluate the camera work and make the necessary adjustments to make sure the composition and staging choices still work with the final set geometry, but in general, all the major decisions in camera blocking has been made. A major studio like Blue Sky must take precautions and be considerate of downstream departments. When you’re handing a shot or sequence off to someone else to work on, it is necessary to correct even minor problems instead of expecting others to work around it. To continue the description of phases beyond previs, the third phase, explained by
Cardone, is the Shot Breakout phase. This phase is very specific to working in a studio. It is a very technical phase that mainly “consists of running scripts to check and clear the file of any extraneous data and then breaking the big sequence file out into individual shot files that include only the necessary characters, camera and portion of the set required for that one file.” From there, the files are checked and sent to the Animation Department. The fourth phase, Cardone explains, takes place simultaneously with the Animation process. “Up until this point our camera work has been composed using stand-in character blocking and posing. Now that an Animator has had the chance to create the actual character performance the acting may be slightly different, more or less broad in range, faster or slower than Camera & Staging has estimated so it may be required to adjust the camera positioning and movement to better track the action in a given shot. Once this performance and camera is approved by the director, the Camera & Staging process is completed.” It is difficult to anticipate exactly how quickly a character will be moving from point A to point B, as a final model may require a different stride, or the acting has added a pause, or any other of a thousand possibilities. As the simple blocking is replaced with fully animated gestures, the camera work is adjusted to accommodate. Cardone also adds to Martino’s description of the difference between the previs process and the process in other departments by describing Camera & Staging as sequence-based as opposed to shot-based. “What this means is that each artist is assigned and is responsible for the camera work for an entire sequence of shots. The artist composes all the shots, addresses all the notes and handles all creative and technical tasks for a given sequence in one big file. Sequences can range from 1 shot to over 200 shots depending on
the action. Lighting, FX, Fur, Compositing and Animation are shot-based departments, which means the individual artists are responsible for working on one or a few shots at a time, not the entire sequence.” This is an important and fascinating distinction. Camera work, which has been my main focus in my research into previs, is not about a single shot (though individual shots are of course important), but about the storytelling over an entire sequence. In a sequence, the shots that come before and the shots that come after help to determine the way any single shot will be read. A shot-based department, such as simulation (fur, cloth, etc.), needs to pay attention to the surrounding shots to ensure consistency, but otherwise need only to be concerned with a single shot.

Kent Seki, Director of Previsualization at Dreamworks Animation Studios also describes the role of previs, including other techniques I’ve mentioned under the blanket term, “previs,” that often get their own names depending on what part of production it is being used. “Previs is used in pre-production to help visualize environments and any other visual story-telling components of our films (d-vis). We also use “pitch-vis” to help pitch ideas and concepts that need more flushed out forms to get approval. In production, previs has become synonymous with Rough Layout. As the look and feel of the previs has become more sophisticated, it has become used more frequently in internal screenings to judge how the movie is progressing.”

Another term I have come across in my research is “post-vis,” which is done after live-action elements have already been shot and therefore does not typically happen in animation. Comparing the process to other departments, Seki says “We end up doing every aspect of production, but more quickly and with less quality. We tend to find the
most efficient solution since our teams are generally fairly small. Our team ends up operating like a small commercial FX or design house.” This statement emphasizes the self-sufficient nature of a previs team. Though it is lower resolution, the team is doing the same work as many other departments combined. Not just camera, but animation, modeling, even lighting are all being done in previs, eventually to be replaced with the finalized versions. They accomplish much of the upfront problem solving ahead of time, so that the downstream departments have less to sift through and work out, and can spend more time on their specific tasks.

Using Previs in Story Development

A common point of difference and active deliberation among studios is how much to use previs in the development of the story of the film. It is clear that the camera work is essential to the storytelling of a film. Story is one thing, but how that story is told, the storytelling, is another matter. In spite of this, or rather because of it, the contention seems to be whether this aspect of the storytelling, the camerawork, should be determined in the story stage of pre-production, at the same time as the script and storyboarding, or if the layout and/or previs team(s) have the right and responsibility to make changes, experiment and alter the story in that later phase of pre-production. It is possible to find examples all across this spectrum. At one end of the spectrum, as reported by Andy Jimenez earlier, the common procedure at Pixar is that the story will be locked down before any previs work ever begins. Kent Seki explains that at Dreamworks, it is determined by the director. “Often times, sequences turn out as they were boarded. In my
experience, about 75% turns out this way. The other 25% can be quite different depending on the situation.” All the way on the other end of the spectrum, Steve Martino explains that at Blue Sky, “[Previs] has a huge influence [on the development of the story of the film]... With still panels you are limited by what an artist can imagine and draw, with the result often being that complex camera moves looked terrible in boards and were often simplified just to make the story reels play better. Several years ago we added a story position with artists working in [Adobe] After Effects to simulate camera motion. This was better than still drawings, but had no direct correspondence to the 3D environment... In the past… there was little time for experimentation with camera. From shot composition to camera choreography, the camera plays a huge role in the storytelling, and by having time to experiment in previs it is clear we are making the story better.” Rob Cardone agrees, saying “There is a tremendous influence that Camera & Staging has on the creative development of the film’s story... Ideally, the larger story changes would happen before the sequences make their way into production but it doesn’t always work out that way. The Camera & Staging department is the first area of production where the story begins to be told through camera in a CG set and things start to solidify. So, we work with the directors, producers and editors to really scrutinize the shots and sequences during the Camera & Staging process with a very critical eye to be sure we are tracking things like continuity and clear staging of information that is important to the story.”

So just how much influence can previs have once the storyboards are completed? As previs artists adapt the storyboards into 3D environments, there are differing levels of
freedom that they might have in taking liberties. As a director, Martino’s approach appears to be that “the previs team is encouraged to push beyond anything that we have created in boards. This is a process where we are expecting the previs artists to push the storytelling to a new level. The only constraint typically comes from keeping an eye on the pacing of a shot or sequence. As with all of our story process, it is in the editing room that we develop and maintain the pace of the storytelling.” Even at Blue Sky, however, this is not always the case, explains Rob Cardone. “The amount of liberty the Camera & Staging department take when adapting the storyboards really depends on the director and how tight the storyboard reel is.” The pre-production process of an animated film, independent of what studio it is being created at, can change drastically depending on the director in charge. Some clearly embrace previs, going by the statements of Steve Martino. Others, particularly if they come from more traditional backgrounds, such as in 2D animation, work exclusively with storyboards or only expand as far as elaborate animatics. “Some directors will try to finesse the story reel as much as possible, using motion graphics and compositing software to split up individual two-dimensional story sketches into multiple levels and animating those levels to simulate the depth of a three-dimensional space,” explains Cardone. “For critical moments in the film, the director may have the storyboard artists carefully render the panels to reflect specific camera angles, certain acting performance and be spot on model with character and set proportions. The director may also spend a great deal of time polishing the pacing and cutting of a sequence using the storyboards to a point where the timing is frame sensitive and may be unwilling to stray from this timing unless it is for a very good reason.”
Despite this tendency in animated film, there is evidence to support gravitation towards directors using previs tools more often. Describes Cardone, “for the most part though, the directors want the film to be the best that it can be so they are very open to new ideas for angles of how a certain action can be shot, or suggestions of shot combinations to simplify cutting and pacing... We always offer a version that closely represents what has been arranged in the storyboards and then we may offer several alternate variations on staging, cutting and/or camera movement depending on how much exploration we feel could help the director capture the desired result.” Kent Seki describes something similar for Dreamworks: “This is completely dependent on the director. The director guides what we do. On Megamind, previs ended up brainstorming and pitching the entire third act final battle back to the director. Other shows may or may not have the same opportunities. It is also highly dependent on the situation and time frame.”

How Previs Changes the Filmmaking Process

As the technology develops, industry professionals integrate previs more and more into their pre-production process. An interesting aspect of this is how the motivation for using previs comes from all sorts of, sometimes completely contrasting, directions. On the one hand, previs is often used as a money-saving planning tool. Designing shots early and with simple, low-resolution versions of a set and characters helps to prevent mistakes in downstream departments which could lead to costly reworks of already finished sequences. On the other hand, as technology develops and the tools become more powerful, previs can be used as a way to push boundaries and expand on
pre-production, replacing standard solutions with brand new ones, worked out in previs. Therefore, all at the same time, previs both reduces and expands on the development of an animated film. When asked how the implementation of previs has changed the filmmaking process, Steve Martino reports “with each film that comes out, both in live-action and in animation, we see directors and cinematographers pushing the envelope in camera choreography.” This statement harkens back to the language of film discussed in the section on previs in live-action film. “Audiences have become accustomed to this and come to movies with greater expectation when it comes to cinematography. Gone are the days where we would head into a production with set quota for ‘locked off’ cameras, done at that time to reduce the cost of rendering the background for every frame of action. The previs process allows us to push the camera storytelling in ways that we never could before.” This is an example of how the developing technologies change the way the storytelling is conducted. As rendering power increases, instances of still cameras are reduced and replaced by moving ones. Rob Cardone speaks more specifically regarding the process at Blue Sky Studios: “The implementation of the Set Previs department here at Blue Sky has been very beneficial to our process. On earlier productions here, the Camera & Staging (Layout) artists were either required to construct their own sets before shooting their sequences or, when that proved to be too time consuming, were required to shoot their sequences in sets that had been completely and finally modeled and were so heavy that they could barely move a camera around in them. It was very obvious that the studio needed a team of people dedicated to working with the designers to create a low-resolution set in light-weight file that would act as the basis for the final version of the set
and could easily be used by the Camera & Staging team to shoot the sequences in. Now that we have this in place, the Camera & Staging artists can concentrate on the cinematography of the film and not have to be distracted by set construction issues.” Kent Seki identifies how changes in previs have affected the process at Dreamworks Animation Studios: “Previs has moved the Layout Department into a position that straddles pre-production and production. It has allowed filmmakers to experiment and explore more after the boarding process has been completed. It has given filmmakers a more accurate screening tool to judge sequences and ultimately their films before rolling into the downstream departments. It has allowed the downstream departments a higher degree of visibility into what the sequences will be and allowed for a more accurate bidding of those sequences.”

These descriptions of process suggest how previs is able to affect creativity within the production pipeline, and how this might also affect the typical hierarchy of a large production studio. A film will always begin with an initial premise, but it is very rare if that premise remains unchanged at the final version of the film. It always becomes something different through the process of creating it. Previs offers more areas for this creativity to occur, and opens up the floor for more artists to have the chance to be a part of that creativity. Rather than all the storytelling power being given to what is usually a relatively small group of people at the very beginning stages of pre-production, the ability to explore, to have iterations, and the added variability that previs offers lets that artistic process become a part of the industry process, and it becomes collaborative, allowing more voices to play a role. A few companies, as suggested by some of the responses
given by these industry professionals, are recognizing that with previs, the storytelling of a film can become a product of multiple voices, and are encouraging and allowing this to happen.

As the previs process expands in many studios, as Kent Seki has suggested, there begins to be the concept that previs bridges a gap between pre-production and production, and therefore has a hand in both. By closing this gap, the seam begins to disappear and in some cases, it may be difficult to determine where pre-production ends and production begins. The basic description might say that production in an animated film can be said to begin once preliminary sets and characters are replaced with final models and animation begins. But there are some ways to suggest how some previs techniques can be continued even into production. And not be previs anymore.
Chapter 3: Previs in my Animated Short Film

Proof of Concept

Prior to making my short film, Wonder, and in order to gain a better understanding of the advantages of using previsualization within the animation production process, I designed a proof of concept exercise to explore the idea of various aspects of concept development and how they work with each other to create a whole that is greater than the sum of its parts. For example, how lighting, color, environment, camera angle and shot pacing along with the many other aesthetic considerations together provide a style and atmosphere conductive to telling the story in the most interesting, emotive and effective way.

For the exercise, I experimented with how I could affect the visual interpretation of one small section of script I had written:

*AI (internal dialogue): “I'm not sure exactly how long I've been in this room. Judging by my hair growth, it's been some time. Day and night are meaningless here. They never turn the lights out. Though, that doesn't seem to bother me as much as one might think... I never need to sleep. I wonder why? I know enough to realize this is strange. And yet I know nothing of who I am or anything about what I did before I was in this room. As far as I know, I was born here the moment I first awoke.”*

“I have many theories, each one as bizarre as the last. I might be having some intensely vivid dream. I consider the possibility that I'm lying in some hospital bed somewhere,
comatose, this being my own mental world. Or maybe I've died. Though I don't know if this place is hell or purgatory. It certainly isn't heaven. Of course, I may simply be insane, this room a delusion. That thought doesn't make me feel much better.”

“And then there's that. Someone's watching. Strangely, I find the thought comforting. At least I know I'm not alone. Someone else is there. In absence of any information about who I am, my thoughts instead linger on who this other person is. It is less... disconcerting to explore this line of questioning than it is to remain frustrated over my lack of self.”

This story was inspired by the idea of what would happen if you woke up in a room with no prior memories? This initial concept was expanded into a story about a scientist and her team developing a human-like robot entity, only for them to accidentally create an emergent intelligence. The “waking up” in a room with no memories, therefore, was from the perspective of the artificial intelligence suddenly becoming self-aware. The primary emotion of the story was fear or anxiety, both with the artificial intelligence, and also the scientists responsible for creating it. Confusion, also, played a strong role. There would also need to be the feeling of passing time. Even though it was a short film concept, the story would need to take place over the course of several months, at least.

For the story, I focused on variations of camera angles and shot pacing, along with some minimal character blocking to visualize the internal dialogue of the character in the script section. To minimize the effect that other aspects of the design might have
on the perception of these main designs, I kept the lighting, texturing, color etc. as simple as possible, using only an ambient occlusion layer in the rendering of the animation.

![Figure 2 - Minimized visuals in an attempt to create a neutral style](image)

The character model was of ambiguous gender (though the scratch voice was male), no hair or eye color. There is a gray-colored shader on the iris, to assist in visually understanding what direction the character is looking in.
The voice over was recorded with a non-actor who was given simple instructions to read the lines with as little emotional interpretation as he could. This was for the purpose of trying to keep the voiceover from influencing the visuals for this experiment. Another way I attempted to do this, and also to keep the animation simple, is that the character does not emote nor speak other than in the voiceover. The environment is a simple box with no props outside of a mattress on the floor and a security camera on the wall. The mattress is just a rounded cube, only there as something for the character to sit on and to remind myself that the room is not intended to be totally empty.

The camera was the focus of this experiment, and therefore the most important aspect by far. There were several shots I wanted to try that involved looking through or looking at the security camera, and the dialogue in the script specifically refers to it as well.
In the first pass of this proof-of-concept I created three versions of this experiment. All three versions used the same script and character blocking, but the camera work was different. The goal was to see what possible ways the perception of the scene would be effected just by changing the camera work, timing and editing.

The first version uses more traditional cutting methods, because I wanted my initial version to be a more neutral starting off point that I could use to compare later, more experimental version. This meant that the shots had fairly quick takes – long enough to perceive the shot but not so long as to make the viewer uncomfortable. The average shot length of a Hollywood produced film in recent decades is between 4 and 6 seconds, and getting shorter. The typical movie-goer, though probably unaware, is accustomed to this average. I felt that making it much faster or slower than this average might alert the viewer, even if only subconsciously, to possible emotional cues that I wanted to avoid in this first version. I also wanted to create standard angles, generally from straight on or slightly oblique, and mostly close-ups and medium shots, with a few long shots for shot variation and one point of view shot from the perspective of a security camera. Except for the Point of View (POV) shot, in which I included mostly because I experiment with a fisheye lens, the camera does not move during a take in order to create a visually and emotionally neutral area to begin the experiment with. The subject is kept mostly centered in the shot at all times, adhering to the fundamentals of a balanced composition which creates a symmetrical appearance. Both sides are of similar visual weight, almost mirrored. It lacks the visual dynamic of an asymmetrical composition, but it suggests a passive formality.
This style of camera work is sometimes described as “invisible,” and tends to be the standard in Hollywood style editing. I wanted to create a feeling of indifference, of apathy, which I thought would leave a sort of emotional void that I could fill in later with new, dramatic camera blocking to change the storytelling. By starting with this neutral visual style, I thought it would be easier to compare and contrast more extreme or experimental styles I might try later.

The second version was intended to be a reversal of the first. Rather than an emotional void, I wanted to create a more distressing or anxious feeling to the mood of the scene. Using a camera in constant motion means that the viewer is unable to rest, and must be mentally active and aware to keep up, suggesting to the audience that the character must also be alert. The camera is always either panning or zooming, and the shots are almost all long shots, with a few close-ups. The long shots produce much more negative space, which I felt would create a feeling of isolation for the character, which in turn would create a feeling of anxiety or fear. The feeling of isolation I was trying to create with the distant camera and the negative space increased the feelings of anxiety, but at times seemed to create too much of a distance between the character and the audience, thereby reducing the amount of empathy that the audience feels for the character. The angles are again, generally standard to emphasize a balanced state of mind, with the exception of one bird's-eye-view, top-down shot while the character walks. This one shot which deviates from the rest helps to add variety to the shots, preventing it from becoming too visually uninteresting. I chose this particular moment to use a shot like this one because in this way, I pair the little bit of action in the scene, the character walking,
with the unusual camera angle to reduce the feeling that the shot was out of place. The character is not always centered, and is often at the edges of the screen. The slightly off-center positioning of the subject helps to provide a casual, relaxed feeling to balance with the stiff formality of the shots with symmetrical composition. I was concerned that if I made all the shots symmetrical, the stiffness would become uncomfortable. Too many asymmetrical shots, meanwhile, would be too casual. By working with both, I hoped to strike a middle range between the two.

The third version is a sort of combination of the previous two, while also pushing more at extremes. Many of the shots are very close, and focus a lot on eyes and hands – the most expressive parts of a person. This I wanted to do as a response to the question I had at the end of the second version. By isolating the character on the screen, was I isolating the character from the audience? With this version, I wanted to make the character more human and personable, to try and make the audience care about what happens to the character, or what that character might be feeling. At the same time, I wanted to increase the feeling of fear or anxiety, and to emphasize the oddness of the story through the storytelling power of the camera. To do this, I chose to use many camera angles that are oblique to the subject of the shot. There are also many close-ups which create an almost abstract composition at times. The camera is mostly stationary, but it is not without movement. The cutting is quick, mostly happening on the action.

There was a lot I was able to glean from the production of the pieces and the analysis of the results, some issues I expected, and some surprised me.
The biggest benefit I was able to take away from the experiment was something that I hadn't thought of until I actually got into the animation aspect – the environment design. Because this was a simple experiment, and the environment design wasn't something I intended to concentrate on, I made a very simple stand-in set that consisted only of a bed mattress sitting on the floor and a security camera on the wall. As I was animating, however, I realized how much the character would interact even with these very simple set pieces, and how much my camera choices would bring focus to elements other than just the character model. The placement of props and set pieces in the environment was dictating the camera's movement throughout the scene just as much as the character blocking. Because of this, I realized that for future projects, I would have to put more effort into even these simple stand-ins if I wanted to make sure that any preliminary camera and character blocking would pertain to later iterations and final models.

These observations helped me to determine that the environment design would have to be one of the earliest steps in the pre-production process. Having several versions of the environment would also add more necessity to different versions of the animation and camera work. Planning the camera work before the set design would ultimately become useless, as the camera would surely change as soon as the set did. Though I was anticipating a non-linear work flow, it seemed to me that a basic understanding of the environment design is essential to have before starting character and camera blocking.

One might argue that you can just move the props, not needing to reset the camera as the environment is built. This can be true; after all, environments can be created after
storyboards have already made some camera decisions. However, for fine tuning of framing, proper composition, or for finding camera angles that perhaps one might not have thought of previously, it would be ideal to have the environment determined first. The environment includes more than just the props. It involves the entire space within which the particular scene exists. It can also include many atmosphere and mood cues that might influence the camera work. Animating the camera around the environment rather than modeling the environment around the camera is also a much simpler task.

These conclusions greatly influenced my process when it came to making my short film, Wonder. In that case, I modeled the environment early on in the pre-production process, even while I was still refining my storyboards. I used a balanced method of working between environment and camera by giving myself flexibility to discover and explore the space for camera angles, but also beginning with low-resolution set pieces that were easy to move and scale to improve a space or a shot or movement.

I also discovered the importance of having a well-timed voice recording prior to setting any previs animation. Because the script called for only internal monologue, I believed the approximate amount of time it would take me to say the lines aloud would be similar enough to the person I recorded. Therefore, I believed there would not be any problems if I started animating based on that timing even though I hadn't started recording anything yet. I was very, very wrong. Though the ultimate timing was similar, the pacing of the sentences was very different than what I expected. Once I listened to the reading, I found I wanted to put pauses in places I didn't anticipate. The timing of the voice to the animation ended up being very different than what I really wanted, but I had
run out of time to add and render more animation to fix these issues and had to “fake it” in the editing process by adding fades instead of cross-dissolves and other tricks. The fades were a temporary fix because they allowed me to artificially elongate scenes by adding a few seconds of length between portions of dialogue. To me it still seems painfully obvious that it was just a trick due to ill-planning, because dialogue overruns into the fades outs, continuing in the black. Even though it was a scratch track and the timing would surely be changed once a new voiceover was recorded, it still should be important to be able to deliver as close to the intended vision of a shot or scene as possible. Needing to change anything for the sole purpose of covering poor planning is bad form. Between these issues and the need for lip-synching in the case of spoken dialogue, it was at this point I decided that I did not want to have dialogue in my short film, and would create a story to support this idea. For Wonder, rather than dialogue, the sound focus would instead be on music. Music, however, is in a very different place in production. Dialogue is recorded early on, to allow for animation to be lip-synched and emotive based on the actor’s performance. Music, however, is in most cases timed to the animation, and therefore happens much later in production. In working on Wonder, I began working with a composer fairly early, before all the camera work and timing was complete. This meant that the composer had to change the music timing as I changed the camera work, which was not the optimal working method. Had I been more experienced, I would probably have waited to begin working with a composer until the timing of the animation was decided.
The most beneficial aspect of the experiment was discovering just how much freedom I had to try unusual techniques. Once the character blocking was finished, I could play around as much as I liked with the camera. Because the sequence was short, I was able to experiment with many different angles and positions. Because computer animation can be prohibitively time consuming, shortcuts are always being looked for. Good planning helps this, but so does being overly cautious. Taking the “safe” route by using traditional, standard techniques cuts down on mistakes or unexpected results. Minimizing experimenting with non-standard ideas also cuts time spent storyboarding and rendering. The purpose of previs is to create a 3D storyboard that is easy to change and manipulate, complex enough to communicate ideas but simple enough that render time is manageable. And because I knew that I had the time, I was not nearly as afraid of time constraints and was free to experiments with ideas that I may not ordinarily have tried. Anything strange, unusual or difficult to imagine I was able to at least see what it might look like. Because it was a previs scene that was easier to render and only took a relatively short amount of time to set up alternate iterations, I could try it without feeling like I wasted too much time if it failed. In this way I could try literally dozens of different versions of the same sequence if I wanted to, and discover things that I may not have thought of by storyboarding alone, since my storyboards tend to use much more standard (i.e., “safe”) styles of camera blocking because they are easier describe in 2D on paper.
The second part of my thesis research involved experimenting with previs techniques, incorporating what I learned from my prototype experience, and using both what I learned as I went, along with my own intuition about where I felt previs could help me the most. My goal was to complete a short, animated film while using previs methods all throughout the process. This served several purposes: it showed how previs can be modified based on the needs and goals of a particular project, and it gave the perspective of an independent animator working with previs, as opposed to a large studio. I wanted to see how significant that difference might be. In a large studio, there must by necessity be significant emphasis placed on communication. With so many individuals working on a single project, making sure that everyone knows exactly what their position is in the pipeline, what their responsibilities are, and what the expectation when they finish their task is, all in such a way that consistency is retained. Previs is often described as a communication tool, which becomes mostly unnecessary for an individual doing all steps of the process herself. Also, a studio has multiple departments of people all working on different aspects of a project simultaneously. By developing methods on my own, as opposed to using only a process as described to me in my research, I had the ability to compare and contrast my methods with those others are using.

My goal here was to discover whether previs is a successful pre-production tool in a situation in which an independent animator is working alone on a short film. I wanted to try and answer questions I had, such as: How is the process of previs that I ultimately used for my short film different compared to the processes used by studios or other independent animators, based on the research I’ve done and the interview responses I
receive? Putting previs to practice made clearer to me the descriptions I was given, and gave me an insider’s perspective, which I felt was important in a field that can sometimes be very technical. I also felt that I would have a fairly unique perspective, as I am still a novice in animation, and have little experience with pre-production at all, let alone previs, a relatively new process. I hoped that this unique perspective would provide interesting insight and contributions, and would lead to interesting conclusions.

My approach to previs centered on the idea of a simplified storyboarding process and the use of previs techniques to create extended animatics and determine cinematic approach through experimentation. In this situation, experimentation took the form of an almost scientific method approach. I began with a “hypothesis” (the storyboard) and refined it from there. There are several examples of how I would refine the camera work. Sometimes it would be by altering the editing or by changing the pacing and order of shots and camera movements, and other times by discovering camera positions through the exploration of the pre-built set and afterward testing the angles and movements I found.

The Story

Any narrative begins with a story. My own process for making *Wonder* began with text, and writing down the story that I wanted to tell. I include writing the script in this step, but for this particular animation, which lacks dialogue, the writing mostly involved describing the action I want to occur and the meaning behind it. I had a few reasons for deciding to exclude dialogue in my storytelling, both creative and practical.
The story I wanted to tell emphasized the fantastic which hides within our mundane everyday lives, and how imagination transforms our world, and I felt that there was no better way to describe this except through speechless wonder. Finally, there is the matter of time, and my own inexperience. My research and personal interests are in the cinematography and camera work, primarily, and the other areas where previs is related. To animate speaking characters, I would have to sacrifice the time spent in the areas I was more interested. I would need to learn how to rig faces, have the time to lip-synch, and find an actor(s) to record the dialogue with. In the time I had available to me, I felt this would be unrealistic.

In *Wonder*, the story is being told through the action and not dialogue, therefore, the description of the action became very specific. Not to say that it would be more so than in a dialogue-heavy piece, but I had to be mindful that the story was going to be told through this action alone, and must be described with clarity, and with continuity in mind. In addition to describing the action, I would also take care to write down any visual ideas that I thought would help move the story along or make a particular point. At this point, everything is still wide open, visually. For the story, I did not want to limit myself and say that nothing can be altered once written down. In fact, I expected that I would want changes and rewrites. I knew that in a long-term project, my feelings might change or I might develop new, better ideas. As a novice in animation and storytelling, I learn new things every day about the techniques with which to best unfold a tale. I might want to exchange the themes that I feel are more important, or what aspects of the story I want to emphasize, even what mood I want to establish for the characters or the audience. It
may also be a more mundane reason, such as clarification of a concept, or toning down a sequence that turned out to be unrealistic to accomplish in the set time frame.

When I write, I want the text to serve as a guide for me, to keep the story moving in a way that makes sense, and noting concepts I need to try and get across with the visuals. It also serves to remind myself at what points I need the audience to notice something specific, and what things to keep ambiguous, as well as various other considerations.

For *Wonder*, I used previs approaches even during visual design phases, particularly as I worked on designs for the color and textures. Drawings that I made during the story phase would appear quite different once rendered in 3D, viewed through a camera lens. These early experiments often prompted me to change composition or the amount of contrast in a particular shot, even to the extent of remaking the textures for a look and feel that translated better in 3D.

*Storyboards*

The storyboard in my methodology was used as a way to organize thoughts, visualize initial camera work and cinematography, and outline the action in a sequential way. The camera choices that I made in these initial sketches were intended to be a starting point that I would expand upon in the layout stage of previs by exploring different camera angles and blocking, and experimenting with cross-cutting techniques. On a bigger project with more people than just myself, I expect that it would be necessary to put more consideration into the storyboards as a communication tool and getting
everyone on the same page. For me, the main purpose of the storyboards was to outline the action, capture character expressions, and record some of the camera and other visual concepts to try in a first pass, as shown in figure 4. It was also an important step to working with the story. At this point, all I had was the writing I had done. Being able to begin visualizing this writing helped me to find out where the story needed clarification, where it was dragging, and cleaning up continuity among other issues that are difficult to pinpoint without looking at it.

At this point, with the research I had already done into previs, I was becoming consciously aware of some of the issues I was having with my storyboards that I had never noticed before. The first that I noticed was keeping track of directional continuity. Though I made an effort to be as clear as possible, with all the twists and turns and areas that Sage was running through, even I sometimes would get lost. Related to this was the set, which I knew would need to be very specific, but since it was not built yet at the time I was drawing the boards, I could not be certain if my composition and framing was consistent. I could immediately begin to see the advantages of previs, and having a pre-built set where I could take a camera, move through it and find my angles and be certain of the framing. Finally, I learned that my knowledge of camera settings and focus was too minimal, and so I took the time to do some research, anticipating it would help.
Figure 4 - Early storyboards from *Wonder*

*Layout and Animatics*

Because of the limitations I was finding while working on storyboards, I moved my work to the layout stage. This is where most of the previs work would occur, and would be a multi-step process. I built the set, a low-resolution cityscape with buildings, telephone poles, alleyways, etc. This became the base I worked from for all the other steps. Once the set was built in 3D, the character positioning was blocked in using the action described in the storyboards as a guide. There were some alterations made, some of them because the layout of the set required it, directional continuity was corrected. Other changes were because I had a few new ideas, and even a couple major changes to the story. I knew that I wanted to be able to animate multiple versions of a sequence so that I can see the differences and make choices through the editing process.

In my work on *Wonder*, I was to see how having simple, easily transformable sets and models allowed me to work fluidly, experimenting not only with the camera work but also with the structure, scale and layout of the set.
I have found that my way of working with previs can be described as a series of passes, each with specific goals that build upon the previous. The first pass begins as a translation of the storyboards into the 3D set. I block out the action of the characters and props, and plan the cinematography, working sequence by sequence. In this first pass, I also work on correcting any problems that arise, such as adjusting the architecture of the set and layout, issues with composition, and solving staging issues like jump cuts or continuity problems that were not anticipated in the boards.

After the set was built, I split up the action into scenes, based on the location of the action. In this case, I had four major scenes. The practical reason for this was to keep the scene files manageable, so that there isn’t an overwhelming number of objects to keep track of, and so that there is less likely to be any problems with the program moving slowly, making the set easier to navigate and animate. The breaks between the scenes were planned to occur in places where there would be the lowest chance of continuity problems. Therefore the breaks were set when the location changed, or the action paused. Consequently the animation of the action had less chance of being interrupted, and any changes I made to the location would not necessarily need to be replicated between scene files.

While focusing on one scene at a time, the temporary character models were placed, scaled and posed. The positioning of these models, particularly their poses, helped to establish character personality and action at particular moments in the timeline. (figure 5) Seeing these poses and positions helped to guide my initial choices of camera placement and composition as I was able to see clearly where the character is in relation
to the rest of the set. I was also able to track visual continuity of a sequence of shots and the composition and framing of the background pieces.

This animation was, at first, only the most minimal of keyframes, such as the broad motion of a character from point A to point B in so many frames. With each subsequent pass, and as temporary character models were replaced with final models, I would elaborate on and refine the animation. I used the storyboards to guide my initial camera placement and composition, refining the animation of props and characters along the way. Though I often used the same shots I had drawn in the storyboards, now that I had a full set to explore, I could take the time to discover new shots and camera movements. In some cases, I made minor variations to angle or zoom or composition. In
other cases, I came up with new concepts that I never would have thought of while boarding and discovered while navigating around the environment.

One concept in particular that was invented in previs, as opposed to in the storyboarding stage, is a sequence where Sage is up on a rooftop and runs through a flock of birds. Though I already had a sequence with her on a rooftop, and a different sequence with her in a courtyard where she runs through the flock of birds, changes to the story necessitated some cuts and moves of concepts. The initial rooftop sequence involved fluttering laundry and a couple dancing. When that was cut, the birds were moved to take its place. This necessitated creating a brand new concept for the courtyard, and completely new camera blocking for both sequences.

While I was creating the first pass of my camera work, lighting was not a great concern. At the time, there were no plans on my part to include lighting, with the intention that the textures would be filling in. Ultimately, I added the ability for the textures to have shadows, and worked on placing lights during my second pass. Also in the second pass, I was doing more experimenting with the camera work, sometimes drastically changing what was in the boards because I was able to discover or plan out shots and sequences that I never would have thought of while drawing the boards. Having the set available, as well as a 3D space to explore, creates an environment conducive to planning camera work. One sequence, taking place in a courtyard, was completely restaged, changing the actions occurring within, even altering the characters involved. This new sequence was constructed entirely in previs.
Camera and Character Blocking

Character and camera pacing was the area where I had the most significant alterations to make with each pass. As the animation became more elaborate and refined with each pass, the camera work would be adjusted to reflect that. The overall pacing, meanwhile, would be scrutinized after renders were made. The playback timing in Maya was often inaccurate, and I would not get a clear feel for the pacing until I could see a rendered sequence that was roughly edited in Premiere, which I was making after every pass, replacing old sequences with new ones. I would also make temporary adjustments, such as reorganizing or removing shots, or changing the speed, and when I found a cut I preferred, I would make those changes in Maya. This meant that it was an iterative process that moved between processes in passes, such as from layout to render, then going back to edit the layout and rendering again.

It's extremely useful to be able to see the sequences rendered. I was able to see and make note of corrections to the pacing and other technical issues or mistakes, but also
I was able to analyze how the shots were working for the storytelling. This was particularly useful while working on *Wonder*, because after a certain point it became quite clear that I had not put enough thought into the character motivations, and there was a lack of driving force to the story. The arc of the story was unclear, and I needed to better show how Sage was changing as a person from the beginning to the end of the film. I would not have noticed many of these problems without the ability to see these early edits, and catching them early was also extremely beneficial as I was able to make changes before I had made any final animations.

*Cinematographic Design Choices*

Even before I began storyboarding, I began working on the visual design of the cinematography. I made the rule for myself that the criteria for these cinematic choices, first and foremost, should aid in the telling of the story. If a choice is made that is counter-intuitive to this goal, or made for superficial reasons that might cause confusion for the viewer or add unnecessary complexity without good reasoning, it should be altered or removed entirely. Every choice needed to have meaning, and the animation should not get overloaded with concepts that do not serve the storytelling.

A question I had to ask myself early on was how to decide between two very meaningful choices? Certainly, there is an element of choosing for my own personal aesthetic, but I had to be mindful of this and supplement my choices with discussions with my peers and committee members, and getting experts involved through my research by reading and analyzing other films. In the end it is a subjective decision, but
my goal was to be always looking back to my primary purpose of story-driven visuals (for a very visually-driven story).

I say that all the choices should be in the effort to tell the story, but what does this mean? I believe I've found four main points to answer this in terms of what I was thinking about as I worked. These four points tie together and overlap in places, but are very standard and traditional rules that all filmmakers use while setting up the visual design of a film.

As a novice in filmmaking, I have to consciously remind myself constantly to be thinking about these points, and use them to help guide me in my decisions. Making certain to pay attention to points like these helps to make certain I am providing the audience with the information they need to follow the story, as well as be visually immersive and interesting. What I found especially interesting about all four of these points was that they each were an overlap of story and camera work, in addition to other visual elements, but each with a different goal, and all of these goals should align. That overlap of story and camera is just about the perfect description of where previs sits in pre-production, and is therefore a key tool in the toolbox for me, as a novice, who is still learning about the best ways to accomplish the goals these four points set up.

**Directing the attention of the audience.**

It is important to use visual cues to tell the audience what they should be paying attention to, what to notice, and what's important in a particular shot. Whatever techniques are used, they should lead the audience from one point of focus to the next in a way that helps the story make sense and keeps the viewer from getting lost. Camera and
focus, as well as color (hue, saturated vs desaturated), are the two main ways of directing attention in *Wonder*.

*Informing the audience about the thoughts of the character.*

Even when a character is capable of *telling* you what she’s thinking or feeling, it is boring to do so and instead, visual choices are made to *show* it. Camera blocking and pacing is significant here, as much as the character blocking and action. There is also the possibility of what one might call an “empathic environment,” where the character’s surroundings reflect the character’s mindset or imagination. Point of View (POV) and reaction shots also serve to direct the audience's attention by showing them where a character's attention is. This not only helps to move the story along, but more importantly, gives a view into the mind of the character and what has caught their focus, leading to an effective way of showing the development of the character throughout the story. For *Wonder*, a film with no dialogue, I found it necessary to rely heavily on these techniques. The idea of the “emphatic environment” is a particularly central element of the storytelling, as Sage’s imagination runs away with her.

*Providing visual information to the audience.*

Certain pieces of information that help to tell the story are provided through visual cues. Things like time of day and weather are shown through visual design aspects like lighting and atmospheric choices. In addition to lighting, the color palette and the saturation level are also a part of this. There are also certain traditional cues that cameras make. For example, a high camera angle tends to make a character look small, diminished and helpless while a low camera angle can make them look overbearing or
These cues are used in conjunction with context to provide information about the character and/or the scene. The main technique I used in *Wonder* was to include both 2D and 3D animation, as well as very specific colors, to make clear to the audience which elements of the story are real, and which are part of the fantastical world of Sage’s imagination, and how her embracing of it develops throughout the piece.

*Setting the mood of the piece.*

Many of the same visual design choices in providing information can also inform the mood, especially in the non-photorealistic rendering style I chose for *Wonder*. Camera exposure, color palette, color saturation, as well as the choices of setting and time of day can all work together to provide an overall mood. And subtle or overt changes to these choices throughout a piece can show the development of the story, or the way a character develops over the arc of that story.

In addition to layout of character and camera blocking, I was also making regular render tests of lighting, textures and shading as I tried out different ways of doing them. These tests did not go as far away from the original ideas as did the camera positioning, as I was able to plan much further ahead of time using aspects like key art drawings that specifically dealt with aspects like the setting, mood and the story. These decisions were not as reliant on timing and the ability to explore a 3D space, and therefore previs was not quite as helpful here for me. There were technical issues to work out, so experimenting early and often was still useful.
Alice laughed. “There’s no use trying,” she said: “one can’t believe impossible things.”

“I daresay you haven’t had much practice,” said the Queen. “When I was your age, I always did it for half-an-hour a day. Why, sometimes I’ve believed as many as six impossible things before breakfast…”

- *Through the Looking Glass (And What Alice Found There)*

*Wonder* is a short animated film about finding the fantastic within the mundane. It is about creating wonder through imagination, and believing in the impossible.

The story begins with Sage walking through her urban surroundings as she does every day. She is indifferent, disenchanted, and apathetic. There is no significance to her day. As she walks past a store window, the wind picks up her hat, forcing her to begin chasing after it. The first “impossible thing” is subtle, but as the wind blows, so too does it blow on the television screens in the store window, forcing an umbrella out of a woman’s hands. Is this coincidence or did the same wind blow in both realities? Either way, it goes unnoticed by Sage as she chases her hat into an alleyway.

In the alley, a giant, building-sized mural looks down passively. As Sage runs past, the mural begins to move and turns to look at her. As the mural appears to be pulling itself off the wall, Sage perhaps notices out of the corner of her eye and stops to look, but as she does, the mural has returned to being simply a mural. Sage is curious, yet doubtful, when the hat flies in front of her face, prompting her to resume her chase. Now, she has more of a motivation than simply regaining her hat – now she’s suspicious.

The next venue is a courtyard with a fountain where a child is flying a kite. Sage jumps off of a bench and finally grabs her hat. Catching her breath, she looks up and watches the child and kite. A new gust of wind snaps the kite string, knocking the child
over. Sage looks up at the kite and watches as it transforms into a dragon, an impossibility that the child does not perceive. Overcome with a sense of wonder, Sage abandons the hat, placing it on the head of the child as she chases after the dragon-kite as it flies between buildings.

As Sage follows the former kite, she watches as it disappears over a rooftop, and continues after it, climbing a fire escape in order to catch up. As she arrives on the roof and takes a look at her surroundings, the dragon has vanished, replaced by a flock of birds of all sorts. These fantastical birds are not ones that belong in a city, but here they are, covering air ducts and TV aerials. Sage dashes through them, picking up speed as the birds scatter into the air. She feels no fear as she leaps across to the next building – escorted, in a way, by these birds.

As Sage lands, jungle plants begin to grow at her feet, creating a forest as she moves towards a water tower looming just above her. Egged on by her newfound sense of wonder and curiosity, she climbs the tower as more fantastical things take shape around her. She is rewarded at the end with a spectacular view of the city through her new perspective.

Visual Style – Inspirations and Motivations

From early on in my design process I knew that I wanted a style that utilized non-photo realistic rendering (NPR). Instead of working to recreate realistic looking cloth and textures, lighting that operates the same way as the real world, and a set that might appear indistinguishable from reality, I wanted to create a visual style that could be far more
expressive; to be the story, not just help to tell it. I wanted a style that could mirror the main character, Sage's, imagination and help the audience to immerse themselves in the feelings and emotions of the animation, and more easily suspend disbelief as fantastic things began to emerge on the screen. I was also interested in trying my hand at making a style that fell outside the normal “computer animated film” standard of slightly stylized objects with bright colors and a “perfect” look that CG tends to lend to animation. I wanted it to feel like there were dirty textures, dust and grime, spilled ink and eraser dust.

The first element that I thought about was the use of a limited color palette to direct the eye and exude a certain mood. I knew that I would have busy background sets and textures, and I didn't want to overload the audience with too many things to look at. By thinking about what I knew for certain about the piece, such as the setting taking place during the day, and that the content's main emphasis was on the idea of imagination enriching your surroundings, I thought that using a color palette like those in Western genre film would be appropriate.

To me, the Western genre is the American version of knight errant stories. Like Arthurian Romance or Chinese Wuxia, the Western protagonist is a wanderer with an internal code to life that does not necessarily conform to what society considers “correct.” My story is, in a way, about the awakening of the protagonist into the knight errant mind set. She begins to define her world through her own imagination, transforming the mundane into something fantastic.

To suitably give the feeling of a Western genre film despite the fact that the setting is clearly urban and modern as opposed to the roaming expanses of the Wild
West, I chose to use mostly yellows, tans, browns and oranges for all elements of the piece, though somewhat desaturated in most parts of the composition. Certain key elements, such as the 2-dimensional animations representative of Sage's imagination, are very saturated for contrast and to emphasize the idea that they are not bound by the boring rules of reality.

I was inspired early on by two different animated shorts, for different reasons. The first is a Canadian 2D short film by Howie Shia. (Figure 7) What drew me to this work was, apart from content that appealed to me, the distinctive visual style. There is little by way of color, but there is lots of movement and animation, even in relatively still, subtle scenes. Artistic camera angles and shots are often just as important as the action taking place within. Sometimes, the foreground animations are secondary to the actions taking place in the background, which can be much more interesting to look at.

Figure 7 - Flutter - Zeppelins
These background elements are slightly surreal in quality, and suggest events of other stories, just not this one. As the protagonist races across a rooftop, laundry fluttering in the wind, we can see dozens of zeppelins hovering in the sky beyond, suggesting that the world he lives in is not quite our own. When he runs through a grassy field, the camera cuts back to show that just under his feet, buried, is the skeleton of some enormous, vaguely human-shaped creature.

Figure 8 - Flutter - Graffiti

Meanwhile, the deuteragonist is inspired to recreate her surroundings through art, by painting giant, imaginative murals, guerrilla-style, in her urban surroundings. (Figure 8)

A second film that I found inspiring was Backwater Gospel, a student-made collaborative project directed by Bo Mathorne. (Figure 9) By the time I first saw this short animation, I had already decided on my Western-style theme and color palette. While this animation begins with a similar color palette, it uses it to evoke a very
different mood from my own. The browns and yellows feel dreary and oppressive, while later scenes give way to different color palettes, such as a sickly green or a stormy night blue.

![Figure 9 - Backwater Gospel - concept art](image)

What was interesting about this piece, however, was the way in which the creators accomplished a hand-drawn appearance to a 3D animation. Every frame appears painstakingly constructed for that specific camera angle. The visual style is accomplished through a combination of matte paintings, compositing, 2D animation and hand-drawn textures, along with the clever integration of 2D animation in character lip-synching, yet all seamlessly blending together so that the entire piece looks just like the concept art. Looking at an image of a prop design can sometimes be difficult to decide whether it is a concept drawing or a render of the finished object. (Figure 10)
Early Visual Development

I had drawn several very quick sketches to get a feel for the setting and the story, which was still being hashed out. There were things I knew for certain, and others that came as I worked on storyboards and shot layout. The clearest to me was the idea of a character running through a city environment. I also had a fairly certain idea of the color palette, though that was refined the more I drew and as the story was fleshed out and I had better motivations for my choices. In this case, the idea of a Western-style mood to evoke the knight errant mentality the protagonist gains in her journey. The one scene that has remained mostly unchanged through the entire process has been one on my earliest sketches – one of a muralist working in colors far more saturated than the monochrome world around him. (Figure 11)
I had also decided early on that I wanted my story to be visually driven, for both creative and practical reasons. Creatively, I wanted to experiment with non-photorealistic rendering, partly because it's not seen as often in computer animation, but mostly because a major component to the story is the idea of imagination. It made sense to me that that means I should push the boundaries of what I can do with the creativity of the visual style. Practically, I knew that my thesis is focused on previs, and therefore, I would be mostly documenting that aspect in my writing. Spending a large amount of time learning how to rig and animate a character for lip-synching I decided was not a good use of my time. The resources I had could be better spent in working more with camera and layout. Therefore, creating a story that could be visually-driven as opposed to relying on dialogue seemed to be a good idea.
Inspirational sketches were done before I had thought very much on how exactly I wanted the computer rendering to look. They were quick drawings with sketchy lines and my attempt to emphasize movement, such as Sage running through an alley, upsetting pigeons. (Figure 12) I had gotten one or two comments from people asking if my sketches were literal representations of how I wanted my animation to look. I hadn't been considering that; the sketches were just how my drawings look when I'm trying to draw quickly. At this stage, the drawings were helping me think and make decisions about the story as I already was pretty certain about the setting. When it came up again during my fifth quarter review, this time with positive encouragement, I decided I should really give it some consideration.
But that had an issue that seemed problematic. Despite the fact that I had positive comments about my drawings, when I drew them, I wasn't drawing in a way that was supposed to relate to the story or overall visual style (except for the colors). I was simply drawing. As I was thinking about this, I realized that, in a way, that made it a visual representation of my imagination. These sketches were documentations of the visuals in my mind, so bringing them out in the animation would be an interesting, meta view of the imagination concept of the story. Sage's world and imagination are ultimately from my own, and this is what my own looks like when I'm not trying to make it into something else.

So I began to think about what I would need to do to emulate my drawing style into 3D. It seemed a difficult task, because my sketches are very flat-looking, with rough, imperfect outlines. Imperfection seems to be one of the most difficult things to accomplish in CG. I concluded that it would be necessary to combine hand drawn or painted textures, with that gritty, “used,” imperfect appearance, procedural or otherwise computer-handled methods so that I could achieve close to the look I was imagining, but without the amount of time it would take to accomplish it all by hand. (Figure 13)
I ultimately changed the textures to be a watercolor look, with the shadows appearing like spilt ink. This look provides more of a richness to the background, and also has given me an advantage with the shadows in that the method I use to create them causes a strange sort of rippling in the edges of the shadows when the camera moves, but when it looks like water color, it appears natural. In fact, I ended up emphasizing in intentionally in some shots.

To emulate outlines as in my original drawings, I worked on several methods. There was the idea of having the outlines hand drawn in the textures, like the scratch marks, but that suffers from being troublesome on curved, organic shapes like characters. There was also the idea of giving the outlines some jitter effect, to match with the rotoscoped elements and help to minimize the CG look. Ultimately, I decided against this idea.
I am using a blend of methods – toon lines in Maya for buildings, and a doubled character mesh with inverse normals for character outlines. (Figure 14) Sage’s texture is watercolor with drawn ink lines. Rendering is done in layers and composited together afterwards, allowing for more visual layers to be added in post-production, such as changing the focus or adding camera shake.

Previs in *Wonder*

As a student new to the filmmaking process, I find myself in the position of beginning with a process steeped in previs strategy. More than anything else, I appreciate the ability it gives me to begin by working intuitively, and using what I learn there to
create a plan to follow. It allows for the best of spontaneity and clearly motivated, systematic planning, all at the same time.

The story structure of *Wonder* can be split into three phases. The first introduces the audience to the character, Sage, and shows that she might be beginning to redefine her world as a fantastic coincidence or conspiracy unexpectedly changes her day. The second is Sage coming to a revelation, realizing that she has the imagination to alter her own perceptions. And the third is Sage embracing her new horizons and creating a journey for herself, exploring her newfound sense of wonder.

The previs used in *Wonder* can be described using these three phases as a guide. Here, I will explain the process I went through and the discoveries I made while creating *Wonder*.

*The Beginning (Opening Shots + Mural)*

I began with the opening scene of *Wonder*. The opening is extremely important, as it introduces Sage and sets up the mood and the visuals for the rest of the film. Maybe it shouldn’t be surprising that, because of this, working on this scene is when I decided that the story needed to change dramatically between my initial storyboards and the final product.

The original concept of *Wonder*, before it was called *Wonder*, was that Sage was not simply apathetic, but depressed. Sage finds her own happiness through her impromptu exploration of the city.
While not a bad story, there were problems, some creative, some practical. Creatively, there were problems of motivation. Why does Sage start to explore? Why does she keep running instead of stopping to look or join in at every interesting thing she sees? I found it difficult both to justify this motivation for her running, and to figure out a way to explain that motivation visually.

I became very aware of all these issues early on. While I did work once again on writing, particularly in constructing more motivations for Sage, and changing elements of the story to make a more optimistic viewpoint for the piece, I chose not to move back into the storyboarding phase of pre-production. Other than a few new set pieces, I had my city already built, and stand in characters ready to be blocked. To begin this new version by storyboarding felt like a backwards movement. I instead created all of my initial character and camera blocking directly in the previs set, based on my new writing.

In addition to having a story that was very different from the final piece, my method of previs was also different. After setting up the scene and blocking the characters, I would work with the camera blocking by setting up multiple cameras, each responsible for a single shot, though it was not structured linearly. Many of these shots overlapped through time, and there were far more than was necessary to cover the action. I set it up this way because I felt that, with previs, renders would be quick and I could use the extra camera footage to do more of my decision making in the editing process through techniques like crosscutting. Though I still feel as though this was an interesting and valuable way to work, eventually my style shifted to working with one camera per scene, and rather than cutting in Premiere, I could rearrange keyframes and view the
scene in Maya. Ultimately, I would still render this rough cut and bring it into Premiere to finesse. I believe this shift in camera blocking methods came about for two main reasons. The first was in the interest of speed. It was faster to set up the render for a single camera, but also, I didn’t have to wait for a render at all to see a rough cut, and didn’t have to work back and forth between the two programs as much. I could see and make changes immediately. The second reason, I believe, was because I was getting better at working with the camera, and my shot choices and sense of flow was beginning to come more intuitively, and I had less reason to work with multiple cameras. Moving keyframes and changing shots on the fly was enough. To facilitate this new brand of camera work, I also started splitting up scenes into even smaller files, some with only a few shots, making it much more manageable. This also made it easier to rearrange or make alterations with each pass.

I believe that, had I been working in a group setting, this new brand of camera blocking would not have worked as well. Because I was working only with myself, I could make immediate decisions and work more intuitively. I could throw out or add shots even in-between renders. In a group, there might be someone else in charge of editing, or a greater need to have each change rendered out to be viewed and commented on by the group.

Another pivotal decision was made while recreating the mural scene. For the most part, this sequence remained almost completely unchanged throughout the entire process of making this short. One of the first sketches I made was of a muralist working on a painting, and even in the final version, there is still this same shot of Sage running past it.
The imagery of a fantastic, colorful painting surrounded by a mostly desaturated world was, from the very beginning, such a core piece of the concept of finding the fantastic within the mundane, that it became an anchor for me. Each scene was compared to the mural, using it as a measuring stick to gauge the strength of concept. Some scenes were cut because I felt they did not come close enough. The decision that was made for this scene during the rewrite of the story, meanwhile, was that the mural would come to life as Sage ran past it. When deciding how to visualize this, the idea of 2D animation was suggested. I had no previous experience with 2D, and was a little wary of it. To practice, I did a test by rotoscoping a woman holding an umbrella. I was so happy with it that I began to add more and more 2D elements to the piece until eventually, it was decided that every element of Sage’s imagination would be rendered this way.

*The Middle (Courtyard)*

This middle section saw the greatest amount of changes throughout the process. It is a pivotal scene, and one that I found difficult to visualize. There were two scenes in the film were previs had a massive impact on the story. The courtyard scene is the biggest of these two examples. Here, the audience is supposed to understand that Sage has changed as a person. She has noticed the magic around her. It needs to be a feeling of realization. While the rewrite of the beginning went smoothly, this section continually changed far into production.

This scene was affected by my work with previs in multiple ways. A major aspect of this is that the entire scene was completely re-written. The original story had Sage
running through a courtyard, upsetting a group of birds being fed by an old woman on a bench. In the rewrite, the birds had been moved to the rooftop to replace a cut element, and the old woman was cut while I was reducing the characters I needed to work with. I knew I needed something magical to happen in this scene, one that Sage would notice and would trigger her revelation, which meant suddenly this blank spot in the story would have to become a major turning point in the story. After going through several revisions, the final version would involve a child flying a kite which gets away from him, transforming into a dragon which Sage chases after. This new version helped to solve a handful of issues. First, it provided a fantastic element for Sage to react to and be astounded by. Another important element was that, at this point, Sage had caught her hat. Up until this scene, the driving force of the action was Sage trying to get it back. Now that it was caught, the driving force needed to shift to something else. I wanted that attention to be on the fantastical elements that Sage is now aware of, but what would cause her to once again start running? I could now have her follow the dragon onto the rooftop, which would at least initiate that motivation to continue running. In addition, having a kite high in the sky for this sequence provided the opportunity to explore interesting shot angles, including ones that would give a good overview of the courtyard, which I felt was important to establish for the audience a midway point position for Sage.

The key elements of the initial version of the scene were either cut or moved into other scenes. Because these changes were made so far into pre-production (and in this case, were still changed even into production), I did not move back to storyboards and therefore was working in previs alone to reimagine the scene. It should be noted that at
this point, what I am doing no longer fits the definition of previs. Instead, I am taking
previs-like techniques, working with an iterative, creative tool to compose the story while
even though I have left pre-production and was now working in the production stage.

Previs by definition occurs during pre-production, and does not continue once production
starts. In my process, the line between pre-production and production became extremely
fluid, and even more so when it came to previs. I had been using previs all throughout
pre-production, and once production began, I continued to use the techniques, but it had
become a different tool. By working in this way, I was catering the sequence directly for
the set that I had. This had some advantages and disadvantages. I was too far along to
change it completely – I still needed to keep the location in the courtyard, for example.
But I was able create a sequence that would help to diminish what I thought were
problems in the composition in the set. By creating a sequence involving a kite, I could
take advantage of very high and very low camera angles to reduce the number of shots
where I needed to grapple with the composition issues. This is the other area of this scene
where I found previs to be extremely useful. My initial design for the space was difficult
to shoot – the composition was poor, and it was difficult to maneuver. By working with
the camera, exploring the scene and introducing some minimal character blocking, I was
able to manipulate the set and the camera work and character blocking, completely
restaging the entire scene for a better solution.

Previs work on this courtyard sequence lasted long into production. Even as other
sequences were being given final passes to the camera work which mostly involved
minor tweaks of the timing, the courtyard sequence was still undergoing major
rearranging of camera blocking and even character animation. Unusually for this sequence, some of the shots were in fact determined by the rotoscope work. In every other case, the rotoscoping was drawn after a shot was finalized. In this case, a few of the shots were chosen after I had found reference footage for the rotoscoping, and created camera angles to suit them.

The End (Rooftop)

The final section of Wonder changed the least from the original concept. A big reason for this was that there were fewer decisions to make: by the time I got to working on this part, most of the major changes and conclusions had already been reached, and I only needed to make the changes to suit these new parameters.

First, the rooftop sequence was altered so that there would be fewer characters to animate. That meant the dancers had to go, and in their place was the flock of fantastical birds. Most of the changes in this sequence, rather than cuts, were additions. I needed to emphasize the idea that Sage has now embraced her imaginative escapades and therefore, the audience should see an increase in their pervasiveness. I wanted to try to include rotoscoped elements in every shot after her climb to the roof. After the birds, I added spontaneously generating plants triggered by her feet, and an influx of sea creatures flying through the air.

The final shots were very similar to the original concept. Sage ultimately ending her adventure on the top of a water tower, overlooking the cityscape, was even in the
original concept drawings. In this new version of the story, there was the addition that the cityscape was now transforming because of Sage’s newfound imaginative powers.

In terms of the previs work for this section, I often combined the camera work with keyframing the positions of certain buildings to help with background composition. I was concerned at first that there would be issues of continuity, but when viewed as a sequence, even I have a hard time spotting which buildings move and where they move to. The viewer’s eyes, meanwhile, will be drawn to Sage and her exploits and will be even less likely to take note of the placement of background elements.

**Reflection**

While creating my short film, I discovered that previs for an independent animator is similar to previs for a studio in more ways than it is different. The main difference between the two is that an independent animator is usually going to be less concerned with using previs to communicate their plans to others.

Though the way I used previs changed constantly throughout the process of making *Wonder*, there are several consistently useful examples that I found invaluable and will continue to work with in future projects. Using cameras to move through a pre-built set and explore, discover and remap camera blocking was the single most incredible aspect of previs. Not only did I feel like, with my particular level of expertise, it was faster to plan out shots this way as opposed to storyboarding them, I actually felt that it expanded my imagination. With storyboarding, I am limited to what I can think of. This should be limitless, but because I am a novice with less experience to draw from, I fall
back on the same standard sets of ideas. With previs, I can explore the set and find
camera angles to better reflect my vision of the story.

Being a central aspect of previs, this ability to explore and discover camera work
was not a surprise to me. What I did find surprising was how far into production I kept
using it. Each pass I made, even after I was completing character animation and
incorporating final textures and lighting, I was still working with the camera, rearranging
shots and tweaking the timing. Another surprise I found was how I could use previs to
help me rewrite my story. This was an unexpected complication, but I feel like the
availability of the set and the freedom it gave me to explore with the camera and move
the characters around like puppets, was an asset that I did not expect to be as incredible as
it was. I was planning on starting over my storyboards, but I am glad now that I skipped
that step and moved straight into the previs work. I feel like the flow has a very intuitive,
organic feel that I don’t think I would have been able to achieve with storyboards alone.

Finally, I found a great deal of value in the “passes” structure that I was using in
my previs, and the techniques I continued to use once I moved into the production stage
and it ceased to be previs. I could make major or minor changes, render them out, edit
them together with the rest of my shots whether they had changed or not, and view the
new edit while comparing it to any or all previous cuts. Working in iterations like this
allowed not only for me to see my progress, but to have a record and have all these visual
concepts right there for me to view and compare, evaluating strengths and weaknesses,
making changes or reincorporating previously cut ones. It became a map of everything I
had learned and all the creative decisions I had made. I was able to see the piece as a

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whole throughout most of the process, replacing shots and sequences as new passes were made, but still retaining old versions of other shots and sequences so that I could view the entire pieces for the sake of the big picture. I believe this aspect of previs and the techniques I borrowed from it was the most valuable tool for me.
Chapter 4: Analysis

As an artist, I find the concept of previs as a new tool as not simply interesting, but remarkably encouraging for a great number of reasons. Primarily, as someone unable to choose just one category of pre-production I am most interested in, here is an area where all phases of production, such as modeling, lighting and cinematography, is needed and necessary. A place for a generalist to shine. Secondarily, I often work intuitively and later find myself unable to express why I might have made certain choices. With previs, I can quickly and intuitively produce work without wasting time and resources. I can then then talk myself through it, taking notes, making adjustments, analyzing as I go, and making new passes, each one better than the last. Each decision made has reasons for them that I can see and test and try, and with each new version, I grow more knowledgeable and eloquent about my own work. I discover things I never knew were there before. Another positive aspect of previs is that it is infinitely customizable. An individual will use previs methods in different ways than a large studio, but will still find it a useful tool in their own, personal way. Finally, as an animator, I find myself most interested in editing and cinematography, and how the camera interacts with the environment – the composition and relationship with the characters – how it tells the story. Unlike storyboards, which are static, previs is really the only way to plan the timing and movements of the camera.

Initial Reactions
In creating *Wonder*, my intention wasn’t for the animation to appear totally spontaneous, but I also didn’t want it to seem contrived. I wanted to allow the story to unfold naturally in front of the audience, even though behind the scenes I am carefully planning each image and movement. Being inexperienced in cinematography, I felt this was difficult to achieve. I could carefully execute each shot as described in my storyboards, but it felt overly staged. I couldn’t simply jump in with no plan at all, the way I did with my pilot study, or else I risked flow and continuity, and more importantly, establishing my character’s motivation. Lack of clarity of my concept caused problems early on, which eventually led to the rewriting of large portions of the short. I was working visually, but was not getting into the heads of my characters. I wasn’t making certain I was giving each shot a motivation.

By working iteratively within the established 3D set, I was able to explore and discover shots with the camera, find “happy accidents,” and intersperse these with the storyboarded shots. I could edit and rearrange as needed, quickly and easily, by using this planning tool. Steve Martino of Blue Sky Studios suggested that previs was a way to expand on the imagination. I couldn’t agree more with that statement. Especially as someone inexperienced with cinematography, I felt like this was a way for me to find blocking and composition that I couldn’t have come up with on my own without more practice. It’s like turning a battle between two boats into a battle between two submarines – suddenly there’s a whole new dimension to work with, and you have to train yourself into thinking in this way. In this case, not only am I moving from 2D into 3D, but I’ve
moved into a space where I can plan my timing just as easily. I can also work with focal lengths and lenses. This way I can plan my composition as well.

In this way, I felt like I was able to experiment creatively, almost like a scientific hypothesis. I didn’t have to back down from an outrageous idea whenever I got one. In addition, if I was feeling stuck with a particular sequence, or the ideas simply were not coming to me, or the composition of the set was difficult to work with, I was able to adjust and alter easily. I could move and scale and change the set as needed. I could grab a camera, look through the viewport and simply move around the space, discovering interesting angles or movements that I might not have thought of before. I could test these theories, make alterations to them, and then use these as my blueprints once it came to creating finalized shots.

One area where I was especially concerned was that I knew I wanted no dialogue, which meant I had to find other means to tell the story. I wanted to communicate a clear story in which the character grows and changes as a person. At the same time, I didn’t want the discovery of wonder to be expressed in a way that was too obvious, because that doesn’t let the viewer think about what the story might mean to them. I like the idea that each viewer brings in their own experiences, and might get something different out of the story I’m telling. I was unsure about the balance I needed to strike here – finding balance appeared to be a recurring theme throughout production. In this case, the key element was making clear which parts of the animation were part of Sage’s imagination, and that they belonged to her and her alone, as opposed to the world magically transforming. The concept wasn’t intended to suggest that the world is actually magic, but through
imagination or optimism or wonder, it might as well be. I wanted to suggest to the audience the idea that the capacity for wonder is in everyone, and you just have to look or imagine the fantastic things within the everyday, to make our own adventures. I made a decision to remove characters from the story because I needed to focus on one character’s emotions and reduce the character animation and modeling I would have to do in my limited time frame. This decision ultimately affected the main story point. Before, characters could react, or not react, to the things around them. Character reaction was a key way in which I planned to show the contrast between Sage’s viewpoint and the viewpoint of others. Now I had very little for the audience to go by.

To resolve these missing parts I began to rely on the camera far more, and used the minor background characters to establish the different viewpoints. One example of this resolution is within the courtyard, where the kite turns into a dragon. In the original shot sequence it appeared that Sage and the kid are looking at the same interpretation of the kite. With previs I was able to rearrange and re-time the camera work to include a reaction shot from the kid’s point of view, therefore supporting the story concept better.

With this addition, I felt like the key point of the animation was pretty clear, but hopefully clear in such a way that the audience can fill in their own thoughts about the meanings of the animation, and don’t feel like the concept is too heavy-handed. However, this was not as much previs as it was me using similar techniques I had learned from studying previs. The point of previs is the ability to work iteratively and quickly find solutions by being immersed in the 3D set and space with a camera to explore. Here, I
was fixing problems in previously established camera blocking while already in production.

Addressing Initial Questions

Coming into this research and project, I established some key questions that I wanted to use my interviews and experiments to address.

Question 1: *How would working with low-poly models of sets and characters early on in the process would affect my initial design choices, especially the cinematography?*

As an amateur, I lack experience. An experienced filmmaker or cinematographer, for example, would be able to create imaginative storyboards, without needing to see the set. For myself, being able to navigate through the set, experiment with camera angles and lens focus distances, to see the timing immediately, was extremely important to my ability to create a sequence. While I could make the storyboards, previs provided me with the ability to expand on my creative choices by using more active camera than I would have otherwise by just drawing shot choices. The use of the active camera provided creative solutions with more movement, better shot variation and tighter timing.

Question 2: *Would I be more imaginative or feel more lost by not having the shot decisions locked down in the storyboarding stage?*

My answer to that must be “both.” I would never want to give up this ability to work with the camera in previs, to explore the set and discover new options I might not have thought of before. At the same time, I think I would have had a much easier time if I
had a better plan from the beginning, and didn’t have to rewrite massive portions of the story. Because I had to rewrite so much, this meant I had to continuously change the camera work to accommodate new sequences and motivations. If my story was solid and I had a steady platform to work from and then move off of as a starting point, I feel like that would have been the idea situation.

Question 3: Where might previs impact my work beyond pre-production?

As I stated in an earlier chapter, previs for me went far into production and thus ceased to be previs, instead become some other iterative, experimental tool for layout, timing, storytelling and ideation. I feel as though this mostly occurred as a result of the peculiarities of my set design and the shortness of my film, as well as mistakes on my part that required a rewrite. But this necessity allowed me to discover a new way to work, moving away from everything being locked down before I start.

That I had this ability to work in a previs-like manner even after production started was valuable to helping me get through the problems I had. On the other hand, it created other problems. For example, the constantly changing camera blocking and especially timing was not very conductive to the music composer’s workflow. Films can be made around pre-recorded music and dialogue, however in this case we were both working around each other, which at times caused confusion and forced re-workings of the music which could have been avoided.

I believe that there are expanded creative possibilities for production houses as previs morphs into something else and expands down the pipeline to become a more creative, iterative process throughout the making of a film. It will include the voices of
many more artists, and can help a production company that retains the same story artists with every production from falling into a formula.

One of the most amazing and useful aspects of previs is how easily it can be catered to suit any studio’s (or individual’s) needs. When starting this project, I began doing research into pre-production methods. When I discovered previs, my fascination with it ultimately made it my focus. What I found as I continued my research, spoke to experts in the industry and worked on my short film was that I had already been using previs techniques. What I thought was a backwards notion of mine that I couldn’t give up on was in fact a method being used in several places in the industry for the same reasons as I was using them.

After coming up with my story idea and storyboarding the first draft, the first thing I did was build the entire set, placing all the props and assets into a scene file. Before previs began being used extensively in animated filmmaking, this would have been considered an incredibly wasteful use of resources. In many cases, I think even now practitioners would question the wisdom of this decision. Why build anything that the camera may not ever look at? Why not plan each shot meticulously first, then only build what is needed?

Part of my methods came from developing them on my own, and part of them came from adapting techniques I heard about from interviews and articles. Being aware now of what is helping me and why, I am better able to articulate these techniques and explain where I use them, why and how.
Building the entirety of the set is still something that should be carefully considered before undertaking. It depends on the set and the style of the animation. In my case, I had very stylized visuals where the textures are doing the majority of the heavy lifting. The set is not overtly large, and the modeling is quite low-poly, so the file does not experience inconvenient slowness while moving the camera. In this sense, it's similar to the initial, low-resolution version of a set that a studio like Blue Sky might make expressly for previs purposes, which would eventually be replaced with a higher resolution set. In my case, it was never necessary to replace the low-resolution models.

Having the full set available in 3D is an amazing asset. It makes it easier to map out the movements of the characters, which was especially important for my short film due to the linear, “chase-sequence” nature of the action taking place, and allows for camera exploration and iterative sequence creation.

While working on *Wonder*, I found many ways to take advantage of this exploration ability. One major example is the courtyard sequence, as described in Chapter 3. While working on this scene, I found that the design of the courtyard area made for poor composition in most of my shots, by exploring with the camera, I was able to alter both the camera work and the set to provide better composition.

Another area where I found this to be helpful was towards the end of the animation, before Sage climbs up the water tower. I was having trouble imagining the best way sequence the shots – how to transition between Sage landing on the building roof after her jump, and beginning her climb to the water tower. Once I had the set built and was able to see the architecture and general composition of the set, I was able to
come up with ideas for shots and how to transition Sage from one action to the next. By exploring with and experimenting with the camera choreography, I was able to find a solution I was happy with, and allowed a transition where the story could move from one location to the next without losing momentum.

In a way, it was like scouting a location for a live-action shoot. As helpful and essential as storyboarding remains, the 3D set adds a whole additional level to the imagination. Moving around in 3D space, exploring angles and movements that I may never have tried or even thought of with storyboards is especially freeing. Added to that is the ability to change camera focus and knowing that everything in the viewport is completely accurate – the placement of set pieces and characters, the camera focus and the aspect ratio are all going to be perfectly representative of the final render. It is important that these aspects be well-represented in order to obtain the intended composition and emotional quality for the final version of the shot. It will also aid in consistency. The low-resolution nature of the set also means that it is easily changeable. This means I now have the best of both the animated and live-action worlds.

Because cinematography is such an essential aspect to previs, an artist’s expertise in camera work can be argued to be the most important skill to have. Skill in cinematography can be gained in part through studying the greats and through film analysis, and some can be intuitive, depending on the artist. But the best way is, of course, through practice and experience. I anticipate that, as a novice, as I work more and become more skilled in camera staging and other aspects of cinematography, my abilities in previs will become more sophisticated and professional.
The ability to quickly iterate is another aspect of previs that I found particularly useful. The time-based nature of animation can be tricky for people new to the medium. Knowing how many frames to hold a shot is instinctive for some people, carefully planned by others, or some combination of the two. It's difficult to know just how it will look until the shots are rendered and edited, because the frame rate inside the scene file can sometimes be deceptive. When a set is able to be quickly rendered and experimented with, multiple options in timing and angles and movements can be explored. Another aspect about this is that one can begin layout with the camera very early on, and can easily change to accommodate later additions to the set or changes in animation. As character and story motivations become more clear with each iteration, camera work can change to reflect it. It makes the process very fluid, but rather than being chaotic, the process can be taken in steps, such as working in passes. In my case, I split up my short film into “scenes” which I determined mostly by location in the set. I would work scene by scene, do the rough character blocking, then the camera work, and experiment with that. Then I would work on texturing, and adjust the camera work to accommodate whatever design or compositional changes I felt the textures added. Character animation came next, which would often change the timing of shots – how fast Sage moves from point A to point B is likely different from the simple “ice-skating” blocking from before. The rotoscoping had to be saved for last, because much of it was dependent on camera blocking and angle, however, early composition tests were made on a few shots once the texturing was in place. This ensured I had a better idea of the final look and could even plan my shots, knowing what the rotoscoping process would be like, to better suit the
needs of the style. For example, camera movement is usually limited or non-existent in the shots where there is rotoscoping. This makes it easier to composite in later stages.

When the interviews with industry professionals were conducted, I had a few ideas about what to expect. For example, I expected Pixar, founded by veterans of 2D animation and which can be considered the founder of the computer animated feature genre, to be traditional in their methods and less reliant on previs. I expected Dreamworks, with a larger film output, and Blue Sky, the smallest of the three, to be potentially more open to or experimental with pre-production methods and therefore more likely to be using previs in a greater context.

In some ways, the responses lined up with my expectations. In other ways, I was surprised. I was about halfway through the work on my animation when I received the responses to my interview questions. By that time, I was far enough through my work to be able to compare my solutions with the various ones that professionals were using. But I also had enough left to accomplish that I could learn from their experience. It was fascinating to compare and contrast the differences between studios and also myself.

How old a studio is, and who the founders or creative heads are, may indeed have a significant impact on how previs is used. While layout is standard in all 3D animation studios, what happens during that stage and how it impacts the rest of production differs widely. Though it differs from director to director, as explained by Andy Jimenez, Pixar typically makes the vast majority of the decisions in the story stage, locking everything down in boards. They work very traditionally. This is in contrast to Blue Sky Studios, a much smaller studio, which is much more frequently and deeply working with previs
techniques. While still reliant on storyboarding and regarding it highly, this studio regularly works so heavily with previs techniques that they even created a separate department to aid the Camera & Staging crew with the process. These differences are very close to my expectations. I generalized filmmakers in animation, based on what I know about myself as a student of animation and what I was picking up in my research. I expected that they like working with what they know, with methods that are proven to work. I made the assumption that traditional animators will have a lot of confidence in their drawing skills, and would be accustomed to throwing ideas around a table and drawing on note cards which can be arranged and rearranged or quickly redrawn. Individuals whose expertise lies with computers, like myself, might think in 3D already, and find it comfortable to work in digital space. What is interesting is how both Blue Sky and Pixar were founded with a combination of traditional animators and computer programmers, and yet each has very different styles of pre-production.

Another major expectation of mine was that how I was working, as an individual on a short film as opposed to a large studio on a much longer film, would mean that the previs methods would be significantly different in style and structure. This ended up being an area where I was, for the most part, wrong. While studying the interview responses that I received, I found that many of the techniques that I was using to create my short film were similar, though on a smaller scale, to the process employed by the large studios, and especially Blue Sky. Rob Cardone's description of their process, how they worked in passes between Camera & Staging and the other departments, was so close to the methods I was already using, that I admit feeling a sense of validation. That
experienced, accomplished individuals came to a similar conclusion as me is encouraging. To me, it felt like a form of validation. It also meant that this pre-production process that I really enjoy working with is being used in the industry, and that I may be able to work with the same process even after I finish my academic work.

Why might it be that these previs methods would be so similar when the scale of production and number of people working on it is so drastically different? Intuitively, this shouldn’t be the case. I feel there are a few factors as to why this ended up being true. There is, for instance, the overlapping style to pre-production. There are multiple departments working at the same time, but a few get their hands on it first. Sometimes overlapping the story process, the previs team begins building a low-resolution version of the set, which is passed to Camera & Staging to do the camera work based on the work done by the story team. “Armed with a story reel of the action provided by Editorial and a lo-resolution version of the set provided by the Design and Previs teams, the Camera & Staging artists will block out the action using lo-resolution versions of our characters.” So far, this is similar to my process. I storyboard, then I build the set, then I work on camera. The next pass is where things are different. After a scene has reached a final previs stage, it is moved into production where high-resolution pieces are modeled, characters begin being animated, and the camera work is adjusted to accommodate, while the previs and Camera & Staging teams work on another scene. As an individual, I cannot simultaneously work in each area the way a studio with multiple departments can. However, the style of my animation meant that a few of these steps were cut out. I did not have to re-model the sets, I had fewer scenes, and the character model was not replaced,
but the character animation was refined with each pass. In this way, the process remains similar – a cycle between refinement of the set and animation and refinement of the camera to match, without it getting too sidetracked by other necessary tasks.

An interesting aspect of this particular process was noticing how previs stretched itself into the full-on production stages. Yes, it is a valuable planning tool, and it was used in that capacity, but when things change during production for whatever reasons (blocking, asset placement, timing), there’s a need to make alterations, and sometimes multiple options are available and need to be experimented with, meaning “pre”-vis methods are still useful here.

One of the biggest differences I noticed, not only in the interviews, but all throughout my research into previs, is how the process affects creative development and the reaction to and control of that affect. There was agreement on all sides that previs does have some effect on creativity in this most pliable part of filmmaking – pre-production. What was widely different was what to do with it, and whether or not it was even a good thing.

Joe Johnston, director of Captain America, an effects-heavy action film, claimed on his blog to ban previs from his set. That he hated it and will never use it.¹ He clearly understands the process, even starting his blog post where he made his claim with an accurate definition of previs and where it is used. Johnston is a skilled storyboard artist and has an extensive background in visual effects, which leaves him more than prepared to plan and visualize sequences. It is interesting, however, that Johnston has such a

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¹ http://30ninjas.com/blog/joe-johnston-blog-previz-is-banned-from-captain-america
vehement disdain for the technique when he claims to have never used it before. Brian Pohl, former CEO and COO of the previs studio Persistence of Vision, in a post on the Animation World Network, gave a systematic response to many of Johnston’s points against previs. While Johnston wrote "Previs tells the crew this is exactly what you want and I think it's much more of a crutch than anything else," Pohl responded “Essentially this translates into the ‘handcuff myth’ that previs is somehow immutable and that intern becomes a creative liability. In many ways, Joe is right here. Without proper guidance or someone to control the client's expectations, the previs process can rapidly spiral out of control and define absolutes or make promises that the production can't cash. Hiring inexperienced previs teams or randomly grabbing a couple of spare animators out of the VFX pool does not help the situation either. Is this the fault of previs? No. The fault lies in the lack of communication between the client and those supplying the service. It also lies in the potential lack of having experienced previs supervisors as an official part of the preproduction process. A director doesn't have to be hand cuffed by previs.” I believe the point Pohl is making here is one that can be applied just about any pre-production tool, including animatics and storyboards. Communication is key in a large production, and the director needs to be clear about his or her expectations for a production. Previs or storyboards or animatics are just a form of communicating visuals, and are supposed to be used to describe ideas and concepts. Whether they describe final absolutes is entirely dependent on the user of the tool.

2 http://www.awn.com/blogs/idea-pioneers/previs-love-it-or-leave-it/its-here-stay
There is also a point where Johnston skirted the edge of how to define previs. While praising the utility of storyboards, he goes on to recommend using animatics.

"Animatics, while they sometimes stray dangerously close to the evil previs, are more like moving storyboards that can give you a sense of timing and, for people who look at storyboards and can't imagine what the sequence is, animatics are ok." Pohl responds “So obtaining timing information is ok, but anything else, technically or conceptually, is irrelevant? Again, this doesn't make sense to me… Previsualization is all about communication. It acts as the hub of a new digital process of making movies. Information from multiple departments coalesces within previs and when orchestrated correctly, previs provides an array of advantages (both technically and conceptually) to a director that was unheard of years ago. Some have chosen to embrace this new process while others have not. This is a choice which I respect, however the lack of some directors willingness to embrace the process doesn't negate its validity or existence.” I also find it curious how Johnston separates animatics and previs. There are, of course, differences, mainly in that previs is 3D and is capable of obtaining some very technical data, if needed. How is this additional data a negative effect? My first thought might be that Johnston sees previs as a process which requires a significant amount of time, money and effort, which might mean that users of previs would be reluctant to make changes once finished, which might lead to this idea of an absolute, unchangeable plan. This leads me to believe that Johnston has not been introduced to a good previs team or individual, one that knows how to balance the readability of the previs of a particular scene with the ease of changing said scene, allowing for multiple iterations and experimentation.
Live-action isn’t the only place where there is contention, or at least a difference in viewpoint, on the affect previs has on the creative development or a film. At Blue Sky Studios, previs has a significant impact on the story development of a film, and the artists working in previs are often encouraged to work beyond the storyboards, to explore and be imaginative. Steve Martino of Blue Sky says “the previs team is encouraged to push beyond anything that we have created in boards. This is a process where we are expecting the previs artists to push the storytelling to a new level.” At Dreamworks, while dependent on the director, it seems that more often than not, the storyboards are representative of the final camera blocking. Kent Seki explains, “Often times, sequences turn out as they were boarded. In my experience, about 75% turns out this way. The other 25% can be quite different depending on the situation.” When asked about whether previs could replace storyboards, I received widely varied responses, though the difference appeared to be dependent on the application. In computer animated features, the experts involved all seemed to agree that, as useful as previs is, it can’t replace storyboards in terms of speed and representation of character expression. Perhaps in the future, we might see previs artists with a “library” of faces which can be swapped in and out of a stand-in, generic character to describe emotions in all but the most character-specific expressions.

In special effects studios, it appears that storyboarding has in some cases already been replaced by digital tools. In these cases, there is little to no character expression to be concerned with, or the camera work is simply too complex to represent accurately with storyboards in the first place. This makes sense, as usually in live-action films,
previs is mostly used in large, effects-heavy or complex action shots. That such a sequence is difficult to plan using storyboards is partly the reason why it was sent to have previs work done in the first place.

The Future of Previs

With the changes to the studio animation process that have been happening already in mind, it might be possible to extrapolate from there what might be seen in the future development of previs in animated filmmaking. From my own point of view, I see the line between pre-production and production eventually blurring to the point of obscurity. Previs would no longer be considered just a part of pre-production, instead having a place from the beginning of the story process, all the way to the end of production. I also believe we could see instances of motion capture work for quick data capture for character and camera movement. Even if that data is eventually replaced by hand-keyed animation, it serves as a good reference and, given the proper pipeline and software, can replace the quick yet detail lacking blocking. Experts in the field were also asked to give their thoughts. Steve Martino suggests that “It will become a natural step in the production pipeline, instead of something only used for complicated action sequences. My dream would be that we could work as fast and loose in the creation of ideas but with characters acting and conveying expression within the previs process.” Kent Seki adds “With more productions taking advantage of virtual production techniques (like Avatar and Alice in Wonderland), there are potentially many avenues for previs techniques to be used in production. At the end of the day, a more non-linear style
of filmmaking may develop where departments do work more closely together.” Rob Cardone does not offer a specific development, but he does see an expansion of previs in the future. “I definitely think previs is here to stay and as technology continues to develop it will be interesting to see what unfolds. The more studios embrace the technology and train their traditional artists and directors to use it, the possibilities are endless. It would be amazing to see what will happen next with the power, flexibility and efficiency of producing films this way coupled with the imagination of generations of filmmakers to come.”

In the future, the line between pre-production and production could blur to the point that it becomes difficult to say where previs ends and production begins. Especially in the case of digital camera work, where the previs files are often the exact same files used in production. The remaining difference, however, would be with the actors. Previs can approximate the intended feeling described in the script, but the performance of the actors can be surprising, can alter the meaning in subtle or overt ways, or they can improvise on the spot. These actions can cause problems by changing the plans outlined in previs, but the previs is only meant to be a guide, and if the performances of the actors enhance the storytelling, then that is an added bonus. Unexpected circumstances like these are one reason why previs, in some situations, continues long into the production phase of filmmaking and ceases to be “pre”-vis. Perhaps the name “previsualization” is no longer appropriate, and another name will become predominant as the function morphs to be all throughout the pipeline of production for both independent filmmakers and studios. It is becoming a creative tool – not just “pre”-planning.
Next Steps

In the future, I would like to continue working on animated shorts in my own time, and I hope to have a career where I am either working in previs or in an area of production which is connected to previs. I expect I will keep using previs in my own personal process, changing and refining it as I become more comfortable and experienced with computer animation in general and with previs specifically.

As much as I have enjoyed creating *Wonder* and using previs to do so, there are several areas where I believe my work flow was weak and would do differently were I to start again. The main area where this comes to mind is in my writing of the story. I began with a very visual concept, and did not have a rock-solid idea of the plot and character motivations. As a result, the story morphed and shifted and changed often throughout the project. Previs was extremely helpful in allowing me the ability to do this, but often times I would feel lost when I would be working on camera staging and was missing the emotional motivations necessary for the shots. Therefore, the sequence would lack flow, and I would continuously have to ask the question, “why?” Why this shot? Why that blocking? Why is Sage doing that? Asking “why” is not a bad thing, in fact, I believe it is a very important part of the story process. What I think is a problem, is when I am still asking these questions far into the production process, at a point where I would have a much clearer idea about where I’m going. On future projects, I will want to develop a clearer concept to begin with by planning out the story more clearly, working through the motivations and outlining the plot with clarity, and can move from there, but will
hopefully never have to repeat the experience of being lost, or feeling the story lacks motivation.

Another area of previs I would like to work with and improve my skill with is environment design, and working low-resolution to high-resolution. For *Wonder*, I was working with a very stylized visual design, and non-photorealistic rendering (NPR). I created my initial, low-resolution set, and save for some minor alterations for composition as I worked, I never replaced the set with high-resolution models. It was never necessary. Most of the distinctive visual design is determined by the textures and color palate. In a future project, though I would like to continue with NPR, I would like to expand my previs process by adding this step and creating high-resolution environments, and working with other tools such as ZBrush or Mudbox to improve my texturing and detailed modeling abilities. This can also be applied to the character modeling and rigging, which for *Wonder* was very basic, with no facial rigging at all. Increasing the complexity of my work will help me gain experience and grow as an artist, and also bring me closer to the way previs usually works in a studio situation, giving me more experience that will be useful for employers.

I very much enjoy being a 3D Generalist, because it gives me the opportunity to work in many areas, including modeling, lighting, animation, texturing and cinematography. By increasing these skills and becoming more experienced and better informed with previs, I believe I will obtain many desirable assets and be able to use them to my advantage, either in my own work or while working in a group setting. As I
increase these skills, I will be able to take on more ambitious projects and set higher bars for myself to overcome.
Appendix A: Interview Responses from Industry Professionals about Previs

As part of my thesis research, I conducted interviews with a series of industry professionals in varying specialties, asking questions about the role of previs in their work. Because of the specific nature of my research (previs in animated film), only a few of these experts had their direct quotes make their way into the body of my paper. However, all of these responses were informative and had an impact on the way I wrote and thought about previs. I was lucky enough to be able to interview a wide variety of specialists, each with their own experiences and perspectives on the state of previs and how it is currently being used. Those working with it the closest appear to be those most excited about its potential.

This is a list of those I contacted and spoke with:

- Rob Cardone, Head of Camera & Staging, also at Blue Sky Studios. I received Mr. Cardone’s responses late February, 2012.
- Kent Seki, Director of Previsualization at Dreamworks Animation Studios (currently working on Mr. Peabody and Sherman). Dreamworks is a large animation studio, with about 2000 employees. I received Mr. Seki’s responses late April, 2012.
- Tyler Kupferer, Previs Artist at Persistence of Vision. POV is a previs studio with less than 10 employees. I received Mr. Kupferer’s responses early March, 2012.
- John Doublestein, Lead Creature Technical Director [creature TD] at Industrial Light and Magic. ILM is one of the oldest and largest visual effects studios. I received Mr. Doublestein’s responses mid-March, 2012.
• Will Kistler, Character Animator at Rhythm & Hues Studios. Rhythm & Hues is a visual effects studio with approximately 1200 employees. I received Mr. Kistler’s responses early March, 2012.

Here, I’ve compiled all of the generous responses I’ve received, as well as listing the specific questions I had asked (which altered slightly depending on the individual). In most cases, these questions were asked and answered through direct email contact.

Steve Martino, Director at Blue Sky Studios (Dr. Seuss’ Horton Hears a Who? And ICE AGE Continental Drift). Art Director on Robots.

Q: What is your role at Blue Sky and how does it relate to previs?

A: As the director, the previs process is my chance to work through ideas in a fast and loose fashion, much in the way that we construct our story reels with storyboard artists. The camera is an import component in the storytelling and the dimensional movement of the camera through space adds a vital emotional sensation to the storytelling. Drawn storyboards can’t capture this element, so as we are working fast and trying a variety of ideas I use previs to capture that sensation without all of the complication of having final detailed models that are computationally heavy. The ideal scenario is that you work fast to approximate the appropriate scale of the environment and you have lightweight character models that enable the previs artist to work fast. In CG we are very used to planning out every shot with great precision, in essence editing the movie before you create the movie in CG. The previs process allows us to create action and shoot it from a variety of camera angles and then through the editorial process construct the best camera action for the scene. As the production process moves from pre-production into the full-scale production, the pressure to lock down the ideas and commit to shot lengths and specific action becomes imperative. In a nutshell, the previs process is my creative sandbox within a 3D environment.

Q: What role does previs play in Blue Sky’s pre-production/production/post-production process?

A: Previs is an extension to the story process, but in the studio structure these artists work alongside the other layout (camera) artists. In production order it falls between our initial pass on an idea in story and before we actually have to start our layout process. The previs artist is often working collaboratively with our
design team as they are often working out the specific design details for sets, locations and props. The early previs work can be very informative to the final design process because it allows a designer to begin seeing concepts through the camera lens and in 3D. Given the scope of our movies and the size of our previs team, this process has been most effective for the conception of big action sequences.

Q: How is this process different than the steps taken by individual departments? (Lighting? Camera? Composition? Modeling? Animation?)

A: The primary difference is that the more stringent technical requirements for models and sequence construction within the scene files in MAYA are minimized, which allows the previs artist work more nimbly to generate camera ideas. Models are made to scale but are lightweight and modular so that the previs artist has more freedom create and experiment with camera choreography.

Q: What influence does previs have on the creative development of the film, if any?

A: It has a huge influence. In our old pipeline, all of the exploration of shot construction was generated through the storyboarding process. With still panels you are limited by what an artist can imagine and draw, with the result often being that complex camera moves looked terrible in boards and were often simplified just to make the story reels play better. Several years ago we added a story position with artists working in [Adobe] After Effects to simulate camera motion. This was better than still drawings, but had no direct correspondence to the 3D environment. As production goes, the later you are in the process, the more pressure there is to move through those tasks quickly. The layout process (camera) happens right before animation and the production managers put incredible pressure to move through the layout process quickly because they are the team feeding the army of animators who need shot inventory. In the past the result was that there was little time for experimentation with camera. From shot composition to camera choreography, the camera plays a huge role in the storytelling and by having time to experiment in pre-vis it is clear that we are making the story better.

Q: What liberties can the previs team take when adapting storyboards?

A: The previs team is encouraged to push beyond anything that we have created in boards. This is a process where we are expecting the previs artists to push the storytelling to a new level. The only constraint typically comes from keeping an eye on the pacing of a shot or sequence. As with all of our story process, it is in the editing room that we develop and maintain the pace of the storytelling.

Q: How extensively is previs used?
A: On the movie that I am just finishing (Ice Age 4) we used previs primarily for the big action sequences and where the camera movement was critical to the storytelling.

Q: How has the implementation of previs changed the filmmaking process as Blue Sky or in general, in your opinion?

A: With each film that comes out, both in live-action and in animation, we see directors and cinematographers pushing the envelope in camera choreography. Audiences have become accustomed to this and come to movies with greater expectation when it comes to cinematography. Gone are the days where we would head into a production with set quota for “locked off” cameras, done at that time to reduce the cost of rendering the background for every frame of action. The privies process allows us to push the camera storytelling in ways that we never could before.

Q: How closely does the previs (or layout) team at Blue Sky work with the other departments and/or the director?

A: They have to work very closely with the design team and with artists who are skilled at modeling. By virtue of the camera-focused work that they do, the team is actually part of our layout department. So, it goes without saying that they are very involved with the rest of the layout team. The pre-vis team works as closely with the director(s) as any of the story artists and given that this work happens earlier in the production process, their time with this director(s) is greater than other teams who are competing for their time when production is in full swing. The previs team also works with the animation department to make sure that they are moving characters in a manner that matches the general locomotion and personality of our characters. Simply put, if we are creating a chase sequence with Manny (Ice Age) you’ve got to know how fast he runs. The team also works with our FX artists so that when we are simulating effects shots we pay attention to the physics of objects and the force of gravity so that we can maintain the illusion that these digital worlds are real.

Q: How do producers respond to previs as opposed to storyboards?

A: They respond very well to sequences that are action oriented and where the camera is such important component to the storytelling. In the past they would have to rely on the director explaining how amazing that camerawork will be. Now they can feel that sensation in the story reel. The one area that they don’t respond as well to is when there is critical expression needed from the character in a scene and all they are seeing is the blocking of action with expressionless character models.

Q: How do you think previs has evolved from when you first started to use it or became aware of it?
A: The ability to animate complex action sequences and then shoot them from a wide variety of angles has allowed us to work in editorial to construct the action from a number of options (like shooting coverage in live action). The editorial process has been given new license to create.

Q: How does the adaptation of previs to the animated filmmaking process compare to live action? (Particularly effects-heavy films?)

A: The pre- vis process in animation tends to be focused on camera experimentation, whereas in live action there is often the need to be tracking technical data for the incorporation of the camera into a real location. The previs process will thus be constrained to the physical capabilities of the camera gear (dolly, crane, helicopter, motion control rig, etc.) that will be used in the final production.

Q: Follow-up: What do you think could change to extend previs’ usefulness and/or viability?

A: Creating character expression in a fast method so that the pre- vis camera could be used for more shots in our story reels. Currently we resort to storyboards when character expression trumps the importance of the camera.

Q: Do you think the use of 3D previs makes shot choices in animated filmmaking more like live-action cinematography? How so?

A: Definitely, more like live action in the way that you we shoot an event from multiple camera angles and build a sequence with editorial choices. Historically, in animation we have worked very hard to make our cameras feel more like live-action camera-work by paying close attention to the physical limitations of shooting in the “real world.” We have done this so that the audience feels that what they are experiencing in this digital world is real. At the same time, live-action directors have been pushing the envelope with camera technology that allows them to move the camera in ways never seen before. The gap is closing between our two production methods in regards to what is possible. We have also seen live-action directors take spin in the world of animation and within a digital world where there really are no practical constraints to how or where you move the camera and thus we’ve seen the language of the camera push even further. All that is to say that the cinematography in live-action and animation are breaking through old boundaries and the pre-vis process is a big part of discovering these breakthroughs.

Q: What do you see as the future for previs (natural progression, evolution)?

A: It will become a natural step in the production pipeline, instead of something used only for complicated action sequences. My dream would be that we could
work as fast and loose in the creation of ideas but with characters acting and conveying expression within the pre-vis process.

Q: Is there any information about previs that you think I have not covered through these questions that you think would be helpful for me to know?

A: Although we do not incorporate this into our pipeline, it would be interesting to know how other studios incorporate motion capture into their pre-vis process. This would be one method to capture acting and expression into the pre-vis process.

Rob Cardone, Head of Camera & Staging at Blue Sky Studios

Q: What is your role at Blue Sky and how does it relate to previs?

A: The term Previs as it applies to live-action holds a slightly different meaning than it does here at Blue Sky.

In live-action, Previs is a process in which CG software is used to create rough versions of the more complex shots in a film’s sequence. This enables directors and producers to evaluate more accurately what may be required for a given sequence with regards to visual FX, set construction and possible CG animated elements as well as whether or not the concept has the visual impact desired for the moment before location shooting ever begins.

Previs, within the animation industry, is basically the process formerly known as Layout. The concept is the same but, the main difference is that the cameras that are set up in Previs will be the official final cameras used in the film and not just used for proof of concept.

We do have a Previs department here at Blue Sky Studios, but is actually not responsible for camera set-ups or cinematography at all. Our Previs department is mainly responsible for creating a technically light, low-resolution version of the set. Our Previs team will work closely with the Art Director and the designers to build a CG version of the set location, taking into consideration certain aspects such as key locations for specific story action, set dimensions and relationship of objects within the set, scale of objects in relation to the characters and any props the characters might use. They will also create a basic representation of any FX that may be required. The Previs artist may place a handful of cameras within the set, like scouting, to be sure the space will work for shooting the action. Other technical departments can look at these rough set-ups and begin to evaluate what developments may be required such as FX, Rigging or Animation. The models that are created in Previs are not final and need to be as light as possible to
The proportions and spacial relationships of these rough models will act as a guide for Final Modeling when the shooting is completed by the Camera & Staging department.

The process at Blue Sky that is responsible for the cinematography of the film is called Camera & Staging. So, to be clear, when I refer to Camera & Staging I am referring to other studios equivalent of the cinematographic side of Previs.

My role as Head of the Camera & Staging department, also known as the Layout department or Previs department at other studios, is to oversee all creative and technical aspects of the planning of the cinematography of our films. I work very closely with the Directors to establish a shooting style for the film. I then supervise a team of artists that set up the cameras, staging and composition of each shot, solving any issues such as screen direction, jump cuts and continuity problems. We will suggest the character's path of action, camera angles and movement that will tell the story in the most dynamic and effective way. We'll also work with the Art Director to plan the light direction for each sequence insuring a clear read of the characters in each shot. The choices that are made here will affect the mood of a sequence and greatly influence the audience's perception of the action, the story and the film.

Q: What role does previs play in Blue Sky’s pre-production/production/post-production process?

A: The role that Camera & Staging plays in pre-production varies from film to film. For the most part, we will try early on, to establish a shooting style that is right for the story and that the director is comfortable with and can be loyal to. This can be tricky because once you establish your shooting style you shouldn't change or abandon it half way through production. If you do, you run the risk of confusing your audience or creating a misleading emotional effect because of the inconsistency. Obviously, the more extreme the shooting style or language of the film is, the more difficult it is to stay loyal to. Also, in pre-production, Camera & Staging will help create a series of test shots that will include examples of the most extreme camera movement, FX, compositing and whatever other extremes of action from the upcoming film that may require new research and development of the technology to create them. The idea being that we try to push the technology so we're prepared for the extreme situations during production.

The role Camera & Staging plays during production is a sequence based process, which means each artist is assigned and is responsible for the camera work for an entire sequence of shots. To do this, the Camera & Staging process is broken down into four phases:

The first phase is the Initial Camera & Staging phase. During this phase, the
Camera & Staging artists will plan the cinematography of the film, sequence by sequence. We work closely with the Director, very early on, to establish a shooting style for the film. Armed with a story reel of the action provided by Editorial and a lo-resolution version of the set provided by the Design and Previs teams, the Camera & Staging artists will block out the action using lo-resolution versions of our characters. Then, the artists proceed to set up the cameras, staging and composition of each shot, solving any issues such as screen direction, jump cuts and continuity problems. We will suggest the character's path of action, camera angles and movement that will tell the story in the most dynamic and effective way. We’ll also work with the Art Director to plan the light direction for each sequence insuring a clear read of the characters in each shot. The choices that are made here will affect the mood of a sequence and greatly influence the audience's perception of the action, the story and the film.

The second phase is the Final Camera & Staging phase. Since the cameras were approved by the Director, the lo-resolution set that was used in the first phase has now been officially designed, completely modeled and set-dressed. All assets and props required for the sequence have been modeled and rigged and are ready to go. During the Final Camera & Staging phase, the artists will evaluate the camera work that was approved by the director in the first phase using all of the official assets. This evaluation includes checking to be sure that no composition or staging choices have been compromised with the replacement of final set geometry. The artists will make the necessary adjustments while maintaining the integrity of the original plan. We will also finesse rough camera movement, correct frame range discrepancies, potentially remove or add new shots and investigate any technical issues that could prove problematic for downstream departments.

The third phase is the Shot Breakout phase. Up until this point all Camera & Staging work has been created in one big file that includes all the sequence cameras, characters, props and set. The Shot Breakout phase, an extremely tedious, technical and challenging process mainly handled by the Final Camera & Staging artists, consists of running scripts to check and clean the file of any extraneous data and then breaking the big sequence file out into individual shot files that include only the necessary characters, camera and portion of the set required for that one file. Each file is then checked and delivered to the Animation Department to be animated.

Which brings us to the fourth phase, which takes place simultaneously with the Animation process. During this phase, representatives from Camera & Staging will be on hand in Animation rounds with the Director. Up until this point our camera work was composed using stand-in character blocking and posing. Now that an Animator has had the chance to create the actual character performance the acting may be slightly different, more or less broad in range, faster or slower.
than Camera & Staging had estimated so it may be required to adjust the camera positioning and movement to better track the action in a given shot. Once this performance and camera is approved by the director, the Camera & Staging process is completed.

Q: How is this process different than the steps taken by individual departments? (Lighting? Camera? Composition? Modeling? Animation?)

A: The main difference between the Camera & Staging process and other processes such as Lighting, Modeling, FX and Animation is that Camera and Staging is a sequence based department. What this means is that each artist is assigned and is responsible for the camera work for an entire sequence of shots. The artist composes all the shots, addresses all notes and handles all creative and technical tasks for a given sequence in one big file. Sequences can range from 1 shot to over 200 shots depending on the action.

Lighting, FX, Fur, Compositing and Animation are shot based departments, which means the individual artists are responsible for working on one or a few shots at a time, not the entire sequence.

Modeling, Rigging, and Materials are asset based departments, which means the individual artists are responsible for working on individual assets such as props, characters and set pieces which are not necessarily inherent to only one specific shot or sequence.

Other departments that are sequence based in their process here at Blue Sky are Story, Design, Set-Dressing and Assembly.

Q: What influence does previs have on the creative development of the story of the film, if any?

A: There is a tremendous influence that Camera & Staging has on the creative development of the film's story. During the production of the film, the story continues to evolve. In order to help a characters arc to play out, to strengthen weaker sections or add comedic or action moments it is necessary for continuous change to happen with the story. All departments need to be as flexible as possible to try to accommodate these changes as they occur.

Ideally, the larger story changes would happen before the sequences make their way into production but it doesn't always work out that way. The Camera & Staging department is the first area of production where the story begins to be told through camera in a CG set and things start to solidify. So, we work with the directors, producers and editors to really scrutinize the shots and sequences during the Camera & Staging process with a very critical eye to be sure we are tracking
things like continuity and clear staging of information that is important to the story.

Often times there is a sequence that contains a series of action that is desired that calls for extremely dimensional and dynamic camera work and character action. For example a "chase" sequence. It is very difficult for a story board artist to achieve the feeling and dimensionality of moving quickly through a three dimensional space with high speed action in a series of two dimensional drawings. In cases like this, production will bypass the story boarding process and Camera & Staging will receive a verbal pitch from the director for an "exploratory" camera phase. During the director pitch, we will discuss the goal of the sequence, the type of camera work and action that needs to take place and exactly the feeling the director would like to convey with the sequence. Sometimes the director may not know exactly what the action is and may ask us to come up with the way a certain situation unfolds or how a story issue is resolved.

Armed with this information the Camera & Staging artist will roughly block out the desired action and then set up a whole series of shots that cover the action from several different angles. In a sense creating a CG storyboard that we then deliver to an editor. Because this is still "exploration" and no cut points have been determined yet, the director and the editor have a great deal of flexibility to use or not use whatever shots or sections of shots they want. Once the director feels he is able to assemble a sequence of action that tells the story the shot exploration phase is approved.

Q: What liberties can the previs team take when adapting storyboards?

A: The amount of liberty the Camera & Staging artists take when adapting the storyboards really depends on the director and how tight the story board reel is. Some directors will try to finesse the story reel as much as possible, using motion graphics and compositing software to split up individual two-dimensional story sketches into multiple levels and animating those levels to simulate the depth of a three dimensional space. For critical moments in the film, the director may have the story board artists carefully render the panels to reflect specific camera angles, certain acting performance and be spot on model with character and set proportions. The director may also spend a great deal of time polishing the pacing and cutting of a sequence using the story boards to a point where the timing is frame sensitive and may be unwilling to stray from this timing unless it is for a very good reason. Usually the director will only take the storyboard to this level of completion for moments in the film that he wants to read perfectly clear early even before they move through production.

For the most part though, the directors want the film to be the best that it can be
so they are very open to new ideas for angles of how a certain action can be shot, or suggestions of shot combinations to simplify cutting and pacing. The Camera & Staging artists are constantly offering variations on ideas for the director to choose from. We always offer a version that closely represents what has been arranged in the storyboards and then we may offer several alternate variations on staging, cutting and/or camera movement depending on how much exploration we feel could help the director capture the desired result.

Q: How extensively is previs used?

A: The Previs process or the camera "exploration" process is used quite extensively here at Blue Sky.

Q: How has the implementation of previs changed the filmmaking process at Blue Sky or in general, in your opinion?

A: The implementation of the Set Previs department here at Blue Sky has been very beneficial to our process. On earlier productions here, the Camera & Staging (Layout) artists were either required to construct their own sets before shooting their sequences or, when that proved to be too time consuming, were required to shoot their sequences in sets that had been completely and finally modeled and were so heavy that they could barely move a camera around in them. It was very obvious that the studio needed a team of people dedicated to working with the designers to create a lo-resolution set in light-weight file that would act as the basis for the final version of the set and could easily be used by the Camera & Staging team to shoot the sequences in. Now that we have this in place, the Camera & Staging artists can concentrate on the cinematography of the film and not have to be distracted by set construction issues.

Generally speaking though, in my opinion, Previs is an incredibly useful tool. It provides a quick, rough blue print of the overall concept of a sequence with a representation of all the visual effects, lighting, animation and camera work that may be required. This enables directors, producers and department heads to visualize the shots and more accurately determine the budget of any given sequence before you ever even begin shooting. It is also cheaper to experiment with different shot choices in this manner than to attempt such a thing on location.

Q: Do you think previs will ever replace more traditional pre-production methods (such as storyboarding)?

A: That is an interesting question. With all the advancements that have been made in technology in film-making over the last few years, maybe Previs might come close to replacing traditional pre-production methods like story boarding in the future. But, for now I would have to say that there are definitely strengths to
Previs and 2D storyboarding. Nothing is faster than a story sketch to get the point across for acting or staging. It is still the most inexpensive way to try out a hundred new ideas for a sequence or a moment in a film. And, a truly experienced director will know if something works or doesn't work even in a two-dimensional story board form. But, Previs enables you to do things in action, chase or flying sequences that would be very difficult to do in a drawing. Previs can help you be true to a space or set which is also difficult to do in a drawing. There are things you can accomplish in a story board and not in Previs and there are things you can accomplish in Previs and not in a storyboard.

Q: How closely does the previs (or layout) team at Blue Sky work with other departments and/or the director?

A: Here at Blue Sky, the Camera & Staging (Layout) team works extremely close with the director. We have daily meetings with him all throughout our process. The director will start our process by giving us, what we call, a kickoff meeting. When possible he will talk through his assembled story reel of a given sequence and explain in great detail everything he knows and would like to try to accomplish with the sequence as a whole and with each shot. We will discuss camera angles, cutting, action choices, screen direction, depth of field, lens choices, mood, time of day and light direction.

The Camera & Staging team is also in constant interaction with all other departments. We work very closely with Design, Modeling and Assembly on set modifications to achieve certain compositions. We have constant back and forth with Animation to insure that the camera work that we created is adjusted accordingly to accommodate the official acting performance without losing the look and feel of the originally planned composition and camera movement. We work with FX to be sure that our shots are set up in a way that offers an ideal composition to show off the effects of a shot while also being cost effective. We have a daily interaction with Editorial and have most of our meetings with the directors right in the editing suites. We work with Compositing often to insure that we supply them with all the elements needed to work. This sometimes results in more than one camera shooting the action in a shot, for example, reflections or television screens, etc. We also have an extensive interaction with Stereo to try and create shots that are pleasing not only in the Mono version of the film but Stereoscopically as well. Many things influence the results of a successful Stereo shot including lens choices, deep space, low camera angles, longer shot durations with less frequent cuts, etc.

Q: How do you think previs has evolved from when you first started to use it or first became aware of it?
A: Previs continues to evolve in the industry and even within Blue Sky. I have been a Layout artist for 19 years. I was working for Walt Disney Feature Animation for 7 years and then I came to Blue Sky Studios in 2000 to build a Layout department on the first Ice Age movie. Before Ice Age, Blue Sky was a visual effects and commercial house. On the sidelines they also produced a short film called "Bunny" which was directed by Chris Wedge and won the Academy Award for Best Animated Short in 1999. After that, 20th Century Fox green lit production on the studio's first feature, Ice Age and it was also directed by Chris Wedge. Up until that point Blue Sky had no need for a full time Layout team but now that we were going to create an animated feature it was essential that we have one. Since that time, many of the tedious clerical tasks that come with the job have been automated, hundreds of tools have been written to help us achieve and finesse our camera work to perfection, the staff has grown from the 5 original artists to the current 26 people and we are always looking for ways to make it better. When I first started at Blue Sky, the studio wasn't even sure what Layout was but over the years it has been an amazing process in showing them what we can do and how it can be used. It is apparent now that these films obviously cannot be made without the Camera & Staging department.

Q: How does the adaptation of previs to the animated filmmaking process compare to live-action? (Particularly effects-heavy films?)

A: Again, in live-action, Previs is a process in which CG software is used to create rough versions of the more complex shots in a film's sequence. This enables directors and producers to evaluate more accurately what may be required for a given sequence with regards to visual FX, set construction, camera work and possible CG animated elements as well as whether or not the concept has the visual impact desired for the moment before location shooting ever begins.

Previs, within the animation industry, is basically the process formerly known as Layout. The concept is the same but, the main difference is that the cameras that are set up in Previs will be the official final cameras used in the film and not just used for proof of concept.

Q: Do you think the use of 3D previs makes shot choices in animated filmmaking more like live-action cinematography? How so?

A: That is an excellent question. The interesting thing that has been happening the last few years on these animated films is that the directors have shown a strong desire to make the virtual camera work feel more like live-action camera work. They want to feel the bumps and imperfections that an actual camera on a practical crane or track has. They want to introduce lens flare from the sun, a hand-held feel or a camera shake in reaction to a heavy impact. They discuss how certain complex actions would be shot on a real live set and ask that we stay
within those limitations all with the goal of trying have the audience feel like they are watching something believable, and not computer generated. It is funny because whenever I speak to anyone from the live-action side of production, I explain what we are trying to do in animation and they think we are crazy because they would give anything not to have the limitations and imperfections inherent on a live-action set with a real camera.

I think the use of Previs or exploration in Camera & Staging helps us to achieve this because we are able to inexpensively and flexibly explore, test and find the best way to subtly or strongly execute the perfect feeling for any given scenario. We have endless options and we're not limited to the amount of times we blow something up or tear something down. We can do it a hundred times and shoot it a hundred different ways if we need to.

Q: What do you see as the future for previs (natural progression, evolution)?

A: I definitely think Previs is here to stay and as technology continues to develop it will be interesting to see what unfolds.

The more studios embrace the technology and train their traditional artists and directors to use it, the possibilities are endless. It would be amazing to see what will happen next with the power, flexibility and efficiency of producing films this way coupled with the imagination of generations of filmmakers to come.

Q: Is there any information about previs that you think I have not covered through these questions that you think would be helpful for me to know?

A: I think your questions were very thorough and I can only hope I answered them clearly enough. If there is anything else that I can do for you please don't hesitate to ask. I'm very happy to have had the opportunity to be a part of this survey. I wish you all the best.

Kent Seki, Director of Previsualization at Dreamworks Animation Studios (currently working on Mr. Peabody and Sherman).

Q: What is your role at your studio and how does it relate to previs?

A: My role at the studio is a show-based one. I was originally brought to PDI/Dreamworks in 2008 to help transition the studio in Redwood City, CA from using proprietary tools in Rough Layout to using the off-the-shelf software Autodesk Maya on the film “Megamind.” At the time, the main facility in Glendale, CA had already made this transition. There was also a push from the
studio to embrace more live-action style previs (i.e. shooting coverage rather than just explicit shots from boards and exploring alternate ways of shooting sequences and pushing the cinematography). Since that transition, my role has been one of a more traditional “Head of Layout.” Those responsibilities are as follows:

1. Listen to and work with the Director to deliver the best cinematography (in terms of camera work) for the show.

2. Work with my Production Supervisor to maximize the performance of every Layout Artist on our team.

3. Collaborate with the other departments to help foster a positive creative working environment and production team.

4. Push the use and technology of Previs here at DWA.

Q: What interested you in pursuing this career? Or how did you find yourself in this position?

A: I have a design background (undergraduate art degree from Yale ’93, concentration in graphic design). After graduating, I moved to New York and became a graphic designer. I happened to meet Colin Green (the founder of Pixel Liberation Front [PLF]) in 1995 right before he started the company and after he had completed extensive work for Douglas Trumbull’s VFX company Mass Illusion on “Judge Dredd.” When he started PLF in NYC, he encouraged me to come in after work and learn Softimage. I started doing this and was offered a job in 1997. I learned about previs, VFX and filmmaking from Colin and everyone else at PLF. I basically learned all of it on the job. Many years later, I had the good fortune of being the HUD/Visualization Supervisor on “Iron Man.” That film was a great experience for me. I was able to contribute by doing previs and also supervising the Heads Up Display shots. There was a truly great supportive team behind the VFX in “Iron Man,” and I was very lucky enough to be a part of a great collaborative effort. After the movie came out I received a call from a DWA recruiter.

Q: What aspects of your education or job experience do you think has been most helpful to you in your current position?

A: My design background is a fundamental component of how I compose shots and see images. Without this training and education, I would not have the framework to do what I do now. I am also very fortunate to have both live-action
and animation experience. The two sides, although much different at times, inform my work on a daily basis.

Q: What role does previs play in your studio’s process?

A: Previs is used in pre-producton to help visualize environments and any other visual story-telling components of our films (dvis). We also use pitch-vis to help pitch ideas and concepts that need more flushed out forms to get approval. In production, previs has become synonymous with Rough Layout. As the look and feel of the previs has become more sophisticated, it has become used more frequently in internal screenings to judge how the movie is progressing.

Q: How is this process different than the steps taken by individual departments? (Lighting? Camera? Composition? Modeling? Animation?)?

A: We end up doing every aspect of a production, but more quickly and with less quality. We tend to find the most efficient solution since our teams are generally fairly small. Our team ends up operating like a small commercial fx or design house.

Q: What influence does previs have on the creative development of the story of the film, if any?

A: This varies from show to show and is dependent on the Director. Often times, sequences turn out as they were boarded. In my experience, about 75% turns out this way. The other 25% can be quite different depending on the situation.

Q: What liberties can the previs team take when adapting storyboards?

A: This is completely dependent on the Director. The Director guides what we do. On “Megamind” Previs ended up brainstorming and pitching the entire third act final battle back to the Director. Other shows may or may not have the same opportunities. It is also highly dependent on the situation and time frame.

Q: How extensively is previs used?

A: The use of previs is also show dependent and not consistent. Some shows use a lot of dvis and pitch vis while others do not. All shows have time allotted for production previs which, again, is part of the Rough Layout Process.

Q: How has the implementation of previs changed the process at your studio or in general, in your opinion?
A: Previs has moved the Layout Department into a position that straddlespre-production and production. It has allowed film makers to experiment and explore more after the boarding process has been completed. It has given film makers a more accurate screening tool to judge sequences and ultimately their films before rolling into the downstream departments. It has allowed the downstream departments a higher degree of visibility into what the sequences will be and allowed for a more accurate bidding of those sequences.

Q: Do you think previs will ever replace more traditional pre-production methods (such as storyboarding)?

A: No. Storyboarding is a very important part of the creative process. It is faster and still provides an invaluable step in the process. In animation, storyboarding is called “story.” This is for good reason. Story artists are tasked with interpreting the script and elaborating. Often times, this involves radical changes to the written pages including the dialog. The story process is just as important in animation as the script writing process. I think a more accurate statement would be that Previs will augment and expand upon more traditional pre-production methods (such as storyboarding). Production Designers like Alex McDowell and Guy Dyas are very progressive in bringing in previs artists for their set design and planning.

Q: How closely does the previs (or layout) team at your studio work with other departments and/or the director?

A: All pre-production previs is more closely tied to the art department. During this time, we end up working with the VFX Supervisor and Production Designer more than the Director. Once we begin production, we have regular meetings and reviews with the Director. We end up working closely with Art and sometimes Animation on the more complicated sequences. As the tools become more sophisticated, I could see previs working more closely with lighting and fx to help plan for those departments as well.

Q: How do you think previs has evolved from when you first started to use it or became aware of it?

A: When I first started in the industry, the typical meeting would consist of us (at PLF) trying to explain what previs was and why someone should use it to a very skeptical audience. Now, previs is used on almost every large VFX film and it has been commoditized. People don’t necessarily know WHAT it is, but they feel they NEED it. Also, it has moved away from a shot-based process (doing a shot here and a shot there) to doing entire sequences. Animation seems to be a bit behind the curve when it comes to utilizing true previs. The animation industry is so steeped in tradition that it is often difficult to change processes and the mindset of how films get made. It is slowly starting to catch up though.
Q: How much modeling of props or characters is done as part of the previs process? Animation? Lighting? Etc.

A: Anything that needs to be represented in the Previs has to be created. This goes for animation, lighting and fx. At this point all aspects of production can be represented (albeit more crudely) in previs. Most of the actual assets are given to us from the art or modeling departments. FX, lighting and rigging are done by us.

Q: Do you think previs has had a difficult time adapting to the animated filmmaking process as compared to live-action? (Particularly effects-heavy films?)

A: Yes – or more accurately, Animation has had a difficult time adapting to the previs process.

Q: Why do you think that might be?

A: Animation is a very tradition based industry with ideas about process that have been long entrenched into the culture of studios. Previs also infringes upon just about every department (character animation, art, lighting effects). This can be threatening to those departments. The irony is that previs could be used by those departments to help them get their ideas out earlier.

Q: Follow-up: What do you think could change to allow previs to be more useful/viable for animation?

A: Education is the primary thing that needs to happen. In order to make an informed choice about HOW to use previs, people need to know WHAT it is and what it can do.

Q: Do you think previs makes animated filmmaking more like live-action cinematography? How so?

A: Yes – The previs process keeps things looser longer. It also has the potential to allow editors in animation to approach the process as liveaction editors by providing coverage for them to cut.

Q: What do you see as the future for previs (natural progression, evolution)?

A: With more productions taking advantage of virtual production techniques (like Avatar and Alice in Wonderland), there are a potentially many avenues for previs techniques to be used in production. At the end of the day, a more non-linear style of film making may develop where departments do work more closely together.

Q: Is there any information about previs that you think I have not covered through these questions that you think would be helpful for me to know?
A: For all the talk about previs, it really is just a process. And that process is NOT for everyone. There is a lot of misinformation about previs out in the entertainment industry. This potentially causes mistrust and bad experiences. For all the talk of how previs can change something, it really is just a tool that can help creative people see their ideas more quickly. If thought of in this manner, previs can be a powerful tool.

**Tyler Kupferer**, Previs Artist at Persistence of Vision

Q: What is your role at your studio and how does it relate to previs?

A: At Persistence of Vision I set up, animate and render shots for various sequences planned for live action feature films. Our manager then cuts the shots with music and sound to generate a very accurate picture of what the final sequence should look and sound like. It’s our goal as previs artists to try to understand the mood, pacing and purpose of a scene and capture those things quickly and effectively for the film’s director.

Q: What interested you in pursuing this career? Or how did you find yourself in this position?

A: I enjoyed filmmaking and animation in High School and became committed to it during my time studying Computer Graphics Technology at Purdue University. I then immediately went to the Savannah College of Art and Design to solidify my artistic side in regards to filmmaking.

Although I took both live action and animation classes, I earned my MFA degree in Animation because I decided I was most passionate about animated films. I found huge success directing my own short films and resolved to work my way up to directing features someday, but I needed an entry-level job to break into the industry.

I had sort of invented previs on my own while working on my thesis film, by building simple 3D sets to help plan how the 2D characters should be animated, so when I found out it was its own micro-industry I started doing more of it. Previs/camera was ideal for me because it combined the technical skills I had learned at Purdue with the screen design principles I had learned in the Film and Television Department at SCAD. Finally, my Animation classes allow me to pull solid performances out of simple CG characters for our sequences. I still get to animate but on a much larger story-level than your typical feature animator.

Q: What aspects of your education or job experience do you think has been most helpful for you in your current position?

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Q: What role does previs play in your studio’s process? How is this process different than the steps taken by individual departments? (Lighting? Camera? Composition? Modeling? Animation?)

A: n/a. Our company only does previs.

Q: What influence does previs have on the creative development of the story of the film, if any? What liberties can the previs team take when adapting storyboards?

A: This depends on the director of the film and the quality of the storyboards. We are almost always working from boards, but sometimes they are very clear and we follow them almost to a T, and other times they, to be honest, suck. In those cases our crew takes huge amounts of liberty, we almost re-invent parts of the sequence in hopes the director will be persuaded to use it. Sometimes they like it and keep it, other times they tell us to go back to the original idea. But I find often our boss (the editor) takes liberty to fill in gaps wherever they occur. So the less specific the director / screenwriter are, the more influence we can have.

Q: How extensively is previs used?

A: We have worked with every major studio on various films. Some only need us for one scene in an entire movies. Other directors LOVE previs and have us work on dozens of sequences. It all depends on the director. Perhaps animation directors are more comfortable with it, because we're used to so much storyboarding, but in live action it varies greatly. We never previs an entire film though, that would be a waste of money.

Q: How has the implementation of previs changed the process at your studio or in general, in your opinion?

A: n/a

Q: Do you think previs will ever replace more traditional pre-production methods (such as storyboarding)?

A: I think it has replaced storyboarding somewhat for live action films. Because working with 3D digital sets is more directly analogous to real world sets, CG previs is more useful for planning live-action films than simple storyboards. Although more elaborate filmmakers still rely on storyboards to preempt our work, too. For animation, I think the essence of the medium will always require it to be based first in drawings, regardless of the final rendering method. But previs
helps more elaborate films plan the complex technical challenges the filmmakers might face.

Q: How closely does the previs (or layout) team at your studio work with other departments and/or the director?

A: We often work closely with the director of a live action film. Our company is designed to be able to relocate to the studio lot that needs us or even to the on location work that's being done. This allows us to be on site with the director or other story artists as they develop the pre-production.

Q: How do you think previs has evolved from when you first started to use it or became aware of it?

A: I have only been aware of it for about a year now so it hasn't changed much since then. But I know since it began in the late nineties, the process has adopted much more elaborate animation and effects. Where it was originally just used to plan shots composition and character placement, we now work a lot with look development, character performances and visual effects planning.

Q: How much modeling of props or characters is done as part of the previs process? Animation? Lighting? Etc.

A: Since we're working for live action films, we build or acquire just about everything we use for our scenes. Even if there's a CG character or digital effects, our models are not used later on for final production. We design our assets for speed and customization; final render assets are too large and detailed for our needs.

Q: Do you think previs has had a difficult time adapting to the animated filmmaking process as compared to live action (particularly effects-heavy films)?

A: Why do you think that might be?

Q: Follow-up: What do you think could change to allow previs to be more useful/viable for animation?

A: I don't know; I would need to do more previs in an animation environment to answer this question.

Q: Do you think previs makes animated filmmaking more like live action cinematography? How so?

A: Yes and no. I think for CG films it does not make a difference compared to live-action, because the end result with both is working in a three-dimensional world, planning shots and motion. However, for 2D films like my thesis project, 3D previs does make it more like live-action or (for that matter) CG animation.
Since the method for building a 2D film restricts you to a scope of view, using 3D previs as a means of exploring the world in 3D provides extra insight into building a shot. This is largely what my thesis paper was about; the use of digital tools for expanding 2D production workflows.

Q: What do you see as the future for previs (natural progression, evolution)?

A: I think as PCs continue to get more and more powerful we're going to be able to mock up more and more complex shots very quickly, so we'll be able to make even more elaborate sequences faster, which will allow previs to become more ubiquitous throughout the professional filmmaking world. It will have its limits; you'll never need it for a romantic comedy or a cheap horror movie, but anything that requires action or visual effects is going to rely more on the quality and speed of 3D previs in the future.

Q: Is there any information about previs that you think I have not covered through these questions that you think would be helpful for me to know?

A: Previs for animation and previs for live action is almost impossible to distinguish already. They all make use of the same design and storytelling methods. As the boundaries between what's live action and what's animation continues to blur even more (think Avatar and Adventures of Tin-Tin), previs for all of these works will play and even more universal role. The only difference between and animation previs artist and a live action previs artist is the kind of people you like to work with. :)


Q: What is your role at your studio and how does it relate to previs (if at all)?

A: My role generally doesn’t apply to pre-visualization but I deal with creating the final color, light, atmosphere, and dimensionality of a scene.

Q: What interested you in pursuing this career? Or how did you find yourself in this position?

A: I discovered that I enjoyed lighting when I was in my senior animation class at Purdue University and decided I wanted to pursue it professionally after school. Once I had a goal in mind I worked my way up through the Hollywood system, starting as a Production Assistant and ending as a mid-level Lighting Artist, which is where I am today.
Q: What aspects of your education or job experience do you think has been most helpful for you in your current position?

A: Learning technical problem solving has been key for my job, I learned that as a student at Purdue University and I found that it has served me extremely well.

Q: What role does previs play in your studio’s process?

A: At my current studio, which is a live action visual effects studio, pre-visualization plays an extremely important role in the process. Before a sequence (a set of shots) can begin in visual effects it is acted out in the pre-vis stage so that the studio and the artists can get a good idea of how to project a realistic scene on top of what is already filmed. In the case of some of the animation studios I have worked at in the past, it allows the director and the production team a chance to move about within the scene and figure out how best to approach a CG animated feature.

Q: How is this process different than the steps taken by individual departments? (Lighting? Camera? Composition? Modeling? Animation?)

A: Not much difference except that pre-vis deals deals primarily with scene construction and the overall action of the film, while the different production departments deal with the nitty-gritty shot work. Within the pipeline Pre Visualization actually falls under “pre-production” while the other departments listed above fall under “production.” With this in mind it can be inferred that pre-visualization is a much more malleable process than the other production-oriented departments.

Q: What influence does previs have on the creative development of the story of the film, if any?

A: This differs between live action and feature animation, although in both cases pre-vis as a department tends not to deal so much with creature development (that falls under Visual Development, which is an entirely different department). So pre-vis doesn’t have much influence in creature development, except to see the creatures in action. Any practical problems tend to be sifted out during the pre-vis process.

Q: What liberties can the previs team take when adapting storyboards?

A: None for the most part, usually any liberties being taken are being taken by the directors, production manager, creative producer, or another member of the creative or story team. Pre-vis in feature animation tends to simply run environment tests and gives the directors a chance to stretch their legs in a scene to see what can be accomplished with the sets and characters available to them. In
live action, the entire purpose of the pre-viz department is to set up the scenes as they appear in the storyboards to see if and how they would work.

Q: How extensively is previs used?

A: Quite extensively.

Q: How has the implementation of previs changed the process at your studio or in general, in your opinion?

A: I honestly wouldn’t know since I haven’t been at a studio where pre-vis wasn’t used. Pre-vis is quite vital to the process.

Q: Do you think previs will ever replace more traditional pre-production methods (such as storyboarding)?

A: No, I don’t. Storyboarding is an essential part of the process. You don’t have to deal with technology to create storyboards, all you need is a pad of paper and a pen.

Q: How closely does the previs (or layout) team at your studio work with other departments and/or the director?

A: Extremely closely in both live action and feature animation. They have to, they are the departments that deal with the scene construction, set dressing, and cinematography.

Q: How do you think previs has evolved from when you first started to use it or became aware of it?

A: I have no idea other than that I know they have begun using more advanced techniques such as having an interactive hand-held camera to move about in some of the sets, allowing the director to get a sense of space.

Q: How much modeling of props or characters is done as part of the previs process? Animation? Lighting? Etc.

A: Quite a bit, usually if a full set isn’t completed then a mock set will be created as a stand-in. Lighting, Animation, and so forth tends to be extremely basic.

Q: Do you think previs has had a difficult time adapting to the animated filmmaking process as compared to live action (particularly effects-heavy films)? Why do you think that might be?
A: I don’t believe so no, but I’m at the end of the pipeline so I’m sure there’s something I’m not seeing.

Q: Follow-up: What do you think could change to allow previs to be more useful/viable for animation?

A: Honestly I don’t know enough about the department to make any suggestions

Q: Do you think previs makes animated film-making more like live action cinematography? How so?

A: Yes, but then again to a certain extent that is the goal of animated films. Animated films are supposed to emulate live action films and build upon them. Reality-based cameras are simulated in feature animation and most cinematography principles are carried over. I wouldn’t say it’s due to pre-vis that animated filmmaking is more like live action cinematography though, this has been the basis of animation since the inception of the animated film.

Q: What do you see as the future for previs (natural progression, evolution)?

A: The ability to re-create the set in real time and allow the director more control in terms of placement of camera, characters, and set dressing. Advanced realtime raytracing techniques would certainly help as well so that the director and cinematographer could get a better idea of lighting schemes earlier in the process.

Q: Is there any information about previs that you think I have not covered through these questions that you think would be helpful for me to know?

A: Not that I can think of.

John Doublestein, Lead Creature Technical Director [creature TD] at Industrial Light and Magic.

Q: What is your role at your studio and how does it relate to previs?

A: The creature department sometimes builds lo-res rigs for previs and layout purposes. These rigs allow for basic animation but lack complex deformations to allow quick posing.

Q: What interested you in pursuing this career? Or how did you find yourself in this position?

A: I started out wanting to pursue animation but found I was better at rigging and simulation which was a good fit for the creature department.
Q: What aspects of your education or job experience do you think has been most helpful for you in your current position?

A: I think that it was very helpful to work in large group projects at school. This helped me specialize in an area and focus rather than trying to do be good at doing everything.

Q: What role does previs play in your studio’s process?

A: We are continuing to develop our in-house pre-viz tool called Zviz. It’s closely tied to our virtual camera system which allows a director to film a virtual set and get real-time feedback of the characters or environment. On Rango, Gore Verbinski used the system to scout locations in the virtual town of Dirt. Every movie we work on has been prevized either internally or by another studio.

Q: How is this process different than the steps taken by individual departments? (Lighting? Camera? Composition? Modeling? Animation?)

A: Usually previz is done by a very small team and is not rendered beyond what can be seen in an interactive viewport. Models and characters are usually taken from a generic library of character archetypes and rarely resemble the actors or costumes. Details and lighting are only important if it helps show a story point.

Q: What influence does previs have on the creative development of the story of the film, if any?

A: Previz is the starting point and effectively replaces the traditional storyboard; however, it’s not set in stone and will change if an animator or layout has a better idea and can present it for approval.

Q: What liberties can the previs team take when adapting storyboards?

A: It’s important to keep anything that is a main story point, but there is freedom to embellish an idea if it will make the shot better without changing it too drastically.

Q: How extensively is previs used? How has the implementation of previs changed the process at your studio or in general, in your opinion? Do you think previs will ever replace more traditional pre-production methods (such as storyboarding)?

A: It’s all about the fastest and most clear way to communicate an idea - sometimes a storyboard will be fast but not clear and previz will be clear but not
as fast - so you still need both - but storyboards are less important than they used to be.

Q: How closely does the previs (or layout) team at your studio work with other departments and/or the director?

A: The director works very closely with previz, but the previz will usually be complete before post-production starts. If VFX has already begun on a shot then we won’t go back to previz, we’ll work forward and submit any changes as animation work-in-progress.

Q: How do you think previs has evolved from when you first started to use it or became aware of it?

A: Previs used to be all about the camera and composition and only needed characters for placement; however, now basic animation, posing and even effects are added as early as possible.

Q: How much modeling of props or characters is done as part of the previs process? Animation? Lighting? Etc.

A: I’d say it is usually the bare minimum to convey the idea - and most of the characters/props are generic enough to be reusable. Animation is very low quality, but does have basic posing and timing.

Q: Do you think previs has had a difficult time adapting to the animated film-making process as compared to live action (particularly effects-heavy films)? Why do you think that might be? Follow-up: What do you think could change to allow previs to be more useful/viable for animation? Do you think previs makes animated film-making more like live action cinematography? How so?

A: No, I think it’s the opposite in that live action becomes more like animation. Animation has always been highly planned out, and live action has been more spontaneous - sometimes changing and adapting to the location or mood of the day. With previs it gives live action a way to try things out before anyone shows up on set and sometimes even program motion-controlled cameras with previz data.

Q: What do you see as the future for previs (natural progression, evolution)?

A: I’d venture to guess that future previs will take place in video game engines and employ the sophisticated level building tools for set dressing and composition.
Will Kistler, Character Animator at Rhythm & Hues Studios.

Q: What is your role at Rhythm & Hues Studios and how does it relate to previs (if at all)?

A: Rhythm and Hues does primarily animation for visual effects, so we’re inserting animals, creatures and characters into films that have been shot in live action. I create the performances for those characters or creatures. By the time I see it, the movie has at least a basic edit, and I’m working on specific shots. Previs is very important to me because if it’s been done well, it’s helped the director plan the movie and what needs to happen in each of the shots I’m working on. I can use it as a tool to get a general sense of what the filmmaker is looking for in each of the shots I’m tasked with, which gives me a good jumping off point for things like blocking and basic emotional states as I start to create the refined performance that will appear in the final product.

Q: What interested you in perusing this career? Or how did you find yourself in this position?

A: I’ve been interested in VFX since I was a young child (Jurassic Park did it to me) and in animation specifically for almost as long (Toy Story and The Mask were very influential to my young brain). I attended Purdue, which gave me a technical background, and then took an online class at AnimationMentor.com which really helped me get a more solid grasp on the art of character animation. After that I was extremely lucky and was admitted to Rhythm and Hues as part of their apprenticeship program and ended up working on the first Alvin and the Chipmunks as my first project out of school. I’ve been lucky enough to work with R&H and a small handful of other studios over the last 5 years.

Q: What aspects of your education or job experience do you think has been most helpful for you in your current position?

A: For bigger studios, like R&H or Sony, I only do character animation. For those, my time at Animation Mentor and the learning I’ve done on the job have been invaluable. For smaller studios, sometimes I’m required to do other things like a bit of rigging or modeling, so my general Purdue background helps me there, though I don’t do either of those things on the level of a professional who specialized in them.

Q: What role does previs play in Rhythm & Hues Studios’ process? How is this process different than the steps taken by individual departments? (Lighting? Camera? Composition? Modeling? Animation?)

A: I can only really speak to the animation department, since that’s where I’m situated. As far as I know, we don’t usually create the previs, and I believe it’s usually given to us by the studio that is hiring us to do the effects work. We use it
as a tool to get a sense of the timing and staging that they’re looking for in each shot. Usually the previs isn’t very developed, as far as nuanced performance goes. It just gives us a general jumping off point.

Q: What influence does previs have on the creative development of the story of the film, if any? What liberties can the previs team take when adapting storyboards?

A: I can’t speak well to this, since I haven’t working directly on creating previs. I’ve worked both directly from storyboards and previs. Storyboards are really good for showing more emotion, previs is good for showing staging and action.

Q: How extensively is previs used?

A: On most of the feature films I’ve worked on, it’s used pretty extensively. By the time it gets to me, it’s often more like a “post-viz” where previz characters are overlayed with actual footage of the shots that have been filmed.

Q: How has the implementation of previs changed the process at Rhythm & Hues Studios or in general, in your opinion?

A: I’ve only been at R&H for about 5 years and so not much has changed in my time here.

Q: Do you think previs will ever replace more traditional pre-production methods (such as storyboarding)?

A: I think there will always be a place for both. It’s way faster to draw a set of storyboards, at least roughly, than it is to set up a scene in 3d, or even 2d, software and animate things within it. It’s just my opinion, but I think we will see storyboards as a way beginning planning and previs as a way to flesh that planning out, especially for things like action sequences or complex live action shoots.

Q: How closely does the previs (or layout) team at Rhythm & Hues Studios work with other departments and/or the director?

A: To the best of my knowledge because R&H is a vendor to larger companies, usually the studios that are hiring us take care of the pre-production and we take care of the post-production. For the most part, I don’t think we create pre-vis here, we just use it to guide us in our work. Our layout team works very closely with animation, mostly to support us when we need help with something technical, but for actually laying things out, they make sure we have what we need in our scene and then let us at it. When I open a new scene, there’s usually no animation in it. The previs isn’t imported, but we can reference it from our video library as we begin animating.
Q: How do you think previs has evolved from when you first started to use it or became aware of it?

A: I’ve only been in the industry for 5 years, and in that time there hasn’t been much evolution as far as I can see. On most projects I have some kind of moving animatic to work from that is blocked out in 3d space or overlayed on the top of actual footage from the project, usually something more complex than just storyboards. In school I didn’t use previs beyond storyboards timed into an animatic because all my projects were small enough in scope for me to manage with fairly basic planning. The same is true with personal projects I do outside of my working hours.

Q: How much modeling of props or characters is done as part of the previs process? Animation? Lighting? Etc.

A: All of the modeling is done before it gets to me. At R&H the modeling and rigging department work together to get our models created and animatable. Sometimes I think we send stills of our models in different poses out so they can be used in animatics. Other times, a previs artist working elsewhere might use a similar model (if we’re working on an bird for instance, they may just grab a similar bird and use it.)

Q: Do you think previs has had a difficult time adapting to the animated film-making process as compared to live action (particularly effects-heavy films)? Why do you think that might be?

A: Well, I’m an animator, but I work mostly on animation for live action films. In our case, I’d imagine the previs is extremely valuable for the director and production crew to have a good idea of what shots they need to get, what needs to happen in each, how fast things will be paced, etc. In an all-animated film, once you get past the storyboard, or storyboards timed into an animatic, I’m not sure there’s such a need for more pre-vis. The animators can just do their own rough pass on blocking the animation in, which would serve the same purpose. Even on my live action work, I do this, since it doesn’t take as long as finely polishing a shot, but can quickly give an idea of the direction I’m going.

Q: Follow-up: What do you think could change to allow previs to be more useful/viable for animation?

A: I think having the animators involved would be helpful. For me, previs is a tool for helping get the director’s vision across to us troops on the ground, but we still like to feel that we have some ownership of the ideas that are going into each of our shots. For a fully animated film, it might be helpful to have the animator
take a shot all the way from very simple previs (chess-piece moves and basic timings, etc) all the way through to completed shot for the final film.

Q: Do you think previs makes animated film-making more like live action cinematography? How so?

A: I’m not sure I can make a blanket statement about this. There are incredibly cinematic animated films, and many that are not so much. I’m sure some really good filmmakers have made good ones without much in the way of previs, and some not-as-talented ones were able to use previs to make their final project better.

Q: What do you see as the future for previs (natural progression, evolution)?

A: Previs as it stands now is very useful to me, but I can’t think of any obvious leaps forward that haven’t already been thought of. When I have it, though, I’m glad I do.

Laura Skowronski, freelance Character Animator

Q: What is your role at your studio and how does it relate to previs (if at all)?

A: Currently I am freelancing (self-employed), taking on projects remotely from home, as well as supervising animation on a worldwide collaborative short film. In 2010 I did work in PreViz briefly freelancing at a studio in NYC called Launch (a division of Charlex, or CHRLX).

Q: What interested you in perusing this career? Or how did you find yourself in this position?

A: Regarding working in PreViz: I found myself working in PreViz as a result of living on the east coast. I had gone out there to work on two seasons of “Abby’s Flying Fairy School” for Sesame Street through a company in NJ called SpeakeasyFX. We had a lot of downtime in between seasons, so I did some freelancing that summer and fall of 2010. I had applied to the position at Launch through a post I had found through a site called Mandy.com; I completed four days of unpaid training with them up in their Times Square location, and then worked a few weeks on a variety of projects. Admittedly at first I didn’t see how previz could be so much in demand, but it became clear that large corporations need previz to maximize marketing potential.

Regarding being an animator, generally speaking: I always had much encouragement to pursue graphics and animation (as I had always been interested in the arts and technology). Lucky for me, my parents had always fostered my interests by enrolling me into drawing, painting, and ceramics classes even while I
was very young. Art was an important outlet for me to which I devoted myself. I absolutely loved cartoons and traditionally-animated features. Even by around age eight, I seemed to know I wanted to be an animator, and I drew all the time. As I got a few years older, however, and various technologies became available to me, my aspirations changed and although art stayed very important to me, I also desired to know as much about computers as I could. This became especially true when I began recognizing a new kind of animation that looked different from what I had grown up with: computer-generated animation was showing up on Sesame Street, in commercials, and even in some classically-animated films as well. As soon as I saw that I could marry my interest in hand-drawn animation with computer technology, I was set in a very clear direction. I first had the opportunity to explore computer graphics in my later high school years, and I saw Purdue CGT as the best next step in my education. After graduation I went on to complete a certification from Animation Mentor (a highly-focused online animation program pairing students with professional animators at a variety of studios; education which I personally treated as though it were a master’s program), and there I developed a greater understanding and practice of animation principles, acting, and body mechanics. Since then I have worked in freelance as well as full time employment at SpeakeasyFX mentioned earlier, which was not a job which I applied to, but one that I was recommended to and subsequently was hired.

Q: What aspects of your education or job experience do you think has been most helpful for you in your current position?

A: Regarding my position as a freelancer, there were senior level project courses in CGT at Purdue that helped me to identify ways of self-promoting and being goal-oriented. Also, I treated my education at AM as a master’s program and community tool which has connected me to job opportunities and continued learning.

Regarding my position as an animation supervisor for my short film team, I believe my courses at AM gave me the eye and skill to be able to critique other’s work. In addition, my experience at SpeakeasyFX included layout, delegation of shots, and similar duties which now very much relate to my role in the production of the short film collaboration.

Q: What role does previs play in your studio’s process?

A: At SpeakeasyFX, previz simply included a script and storyboard drawings, which put together with a VO (voice over record session) into real time using video editing software gave us the ability to time out the 8-minute shows and get a sense for story flow and pacing.
At Launch, which is a previz studio, the end goal is to satisfy companies who need to give specific visual direction to their marketing teams and other parties involved in making their commercials. As an animator, I was given sections of the commercial (called shots; any time the camera changes), and I would be responsible for cleaning up any motion capture used for that section, as well as finessing animation on top of that or adding prop animation, as well as facial and other animation to convey the actor’s emotions and thoughts. This would go on to other departments who would string together the Previz in a rendered form with audio, which would then be pitched to the client so that they could move forward in filming a live action commercial, for example.

Q: How is this process different than the steps taken by individual departments? (Lighting? Camera? Composition? Modeling? Animation?)

A: At SpeakeasyFX we did not have a specific previz department in house, but we directly worked with the storyboard artist and voice actors, then brought everything in to our editorial department. Once the “cut” was put together, we could show our client (Sesame) and they would approve it or work with us to get it ready for CG production. Essentially the difference was that previz was not CG, but only drawings and some video editing. We did, however, take the storyboard animatic (which we called the “boardomatic”) and translated it into the layout animatic (or “layomatic”), which was a CG adaptation of the boards involving positioning camerawork, characters, props, sets, and VO audio clips. This step might equate to previz, and would be different from other departments because it only served the purposes of initially translating the boardomatic, building it into CG shots which could then go through all the other departments for finishing touches.

At Launch, being a previz studio, the entire company (all departments) worked for the purpose of making previz videos. The company was responsible for storyboards, VO, shooting motion capture, cleaning mocap, animating, texturing, lighting, and rendering, as well as producing a video to show the client; that video would then serve as the instruction for the client’s marketing team to produce commercials. Launch has built a library of modeled characters, sets, and props, which continues to grow with every client and every commercial for which they do previz.

Q: What influence does previs have on the creative development of the story of the film, if any?

A: Previz is especially influential in getting the timing right, which promotes the emotional beats in the story and the effectiveness of the visuals happening on screen.
Q: What liberties can the previs team take when adapting storyboards?

A: Previz is generally responsible for timing out the shots, determining whether the cut timing is quick or slow, comedic or introspective, etc. It plays an important role in the cinematography & composition of the project.

Q: How extensively is previs used?

A: In the commercial industry, it seems to be very prevalent in big time commercials (network, nationwide, etc). In local commercials and tv productions, little to no previz is generally used. Previz is used extensively in the film industry as well as in video games, and often the more previz that is done will have a higher quality output in the end result.

Q: How has the implementation of previs changed the process at your studio or in general, in your opinion?

A: In my animation career, there hasn’t been a time when previz was not used. I believe that before previz, everything would be done “straight-ahead” which is an animation term for just rolling with your ideas and the flow of the moment. Sometimes that works, but most of the time you need to put together ideas of what you want your end result to be, or you may not achieve it effectively.

Q: Do you think previs will ever replace more traditional pre-production methods (such as storyboarding)?

A: To me this question is similar to the question about whether society will ever give up paper, given all the technology we now have. I don’t believe so. Many talented artists still crave working with their hands on something tangible, and we have learned much from these tangible art forms (even such as storyboarding). Drawing is such an inherent, universal language that is fast to output and comprehend, that I don’t think it will ever go out of style. Storyboarding is still so very crucial in filmmaking; take Pixar for example, who draws out all their storyboards, lines up all the images on a huge wall, and shifts pages around, adding or removing them, until a crisp, beautiful story unfolds. If they were to simply skip that and go right into previz, I guarantee you their stories would not be as time-honored and layered as they currently are.

Q: How closely does the previs (or layout) team at your studio work with other departments and/or the director?

A: Layout at SpeakeasyFX worked directly from the boardomatic, which was completed by the animation director and editorial department using storyboards and VO clips. Being a layout artist, I depended on editorial to output the boardomatic with layover text informing me frame numbers and where the VO clip was stored on our server. Once I had this information, I could translate that
into a fully CG file with camerawork, characters, props, set, and audio. I would then output a playblast video of each shot to editorial, who would string the CG shots together into the layomatic. Throughout this entire process, I would be using my own artistic strengths to find the appropriate composition, achieve consistency throughout the shots and cinematography, and bare bones acting to get the idea across. I would then look to the animation director who would suggest camera or timing alterations in any movement happening on screen until we reached an end product, which we would then delegate to animators and other generalists in production as needed. I also animated shots once the layomatic was completed.

Q: How do you think previs has evolved from when you first started to use it or became aware of it?

A: Generally the methods have become faster and more refined, and has involved more aspects of production (primarily modeling and some animation, but sometimes even lighting if it is crucial to the need of the story).

Q: How much modeling of props or characters is done as part of the previs process? Animation? Lighting? Etc.

A: All models should at least contain their intended silhouettes so that staging can happen correctly. From a rigging standpoint, at the very least, a master control should be implemented and used to transform the model on the screen as necessary. Preferably, the layout artist will work with a mostly-finished model with a stand-in rig or better, so that a little bit of action and emotion can be blocked during the previz phase. Lighting is unnecessary unless it is an absolutely critical part of the project (in other words, if lighting changes are prevalent in the storytelling). Generally, default lighting is fully acceptable at this time, and any daytime/nighttime adjustments (etc) can be “faked” in editorial by temporarily using brightness and other filters layered over the cut.

Q: Do you think previs has had a difficult time adapting to the animated filmmaking process as compared to live action (particularly effects-heavy films)? Why do you think that might be?

A: Honestly I think previz may in fact be more natural to do for animated film than live action, due to the level of creativity and breaking from reality that is allowable in animation (whether in character, motion, effects, etc). However, due to this natural or easy feel, I believe that these days a lot of animation studios rush to employ their various departments, hurrying to show the world their various capabilities in CG, and they are caring less about story development and previz. In other words, I don’t think previz has a difficult time adapting to animation; I feel that animation has a difficult time (and some level of impatience), failing to making full use of previz.
Q: Follow-up: What do you think could change to allow previs to be more useful/viable for animation?

A: In animation, where previz shines is anticipating story and technical problems; so when studios make full use of previz, it is clearly a useful and viable process. It is a perfect testing ground for effective storytelling and for alerting tools dev and other generalist departments any technical problems that arise from simply building the shots in CG. It is also great for production coordination, discovering what assets are most ready to be used and therefore what shots will be the fastest to produce, as well as where “money shots” are and developing teasers or trailers. To be even more viable, previz would have to extend into other areas, such as lighting, effects, transitions, audio layering, etc.

Q: Do you think previs makes animated film-making more like live action cinematography? How so?

A: In general, live action cinematography is still a much more respected art form in the film community than animation. For animation studios who use previz extensively, such as Pixar, the end result is clear: cinematography is better, in terms of camerawork and storytelling, which is all more thought out and results in a better, more respectable, effective product.

Q: What do you see as the future for previs (natural progression, evolution)?

A: Because it is so helpful in storytelling, it may also become more helpful in departments like lighting, which may be able to anticipate challenges sooner. Other than that, previz will continue to involve cleaner drawings, crisper cuts, and more involved camerawork.

Q: Is there any information about previs that you think I have not covered through these questions that you think would be helpful for me to know?

A: Previs in the commercial industry is very cutthroat. The production time is fast, with very long hours. It can be lucrative, but it is a very intense industry. I found that previz in a longer-term contract (such as for tv or film) is still fast-paced, but for my personality, it has allowed me a less intense environment where I feel safer to be more creative and open with my ideas. It is up to you to decide your personality and where you might fit best, and the best thing you can do is to try everything. Best of luck in your endeavors.
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