

**“Three letters to a child”:
Producing a documentary film with mid-range technology**

Master of Arts thesis
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ABSTRACT

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| <i>Abstract</i> | | |
| <p>Recent technological developments have made cinema production- and post-production hardware and software accessible to large audiences. Historically, cinema production has been an endeavor that has required such manpower and initial monetary investment that the art has been beyond the reach of most people. Thanks largely to computer-technology –related developments, however, equipment and software for filmmaking are becoming affordable, thus a development that we can call the democratization of filmmaking is taking place.</p> <p>Most cinema productions that end up enjoying any appreciation or attention tend to still be relatively high budget productions. This gives rise to an interesting question: is this because of the talent of those people working in high-budget productions, or is it due to objective quality that can only be achieved with relatively high-end production- and post-production hardware and software? Or could producing professional-quality cinema be possible with mid-range technology? The latter question is the research problem in this project.</p> <p>My hypothesis is that it is in fact possible to produce professional-quality cinema with technology that is not prohibitively expensive or complex for a lot of people. In other words, at least in theory, it is now more possible than ever for aspirants to produce decent cinema.</p> <p>The most relevant technological developments with regards to the democratization of cinema production are the emergence of DSLR video, and software developments related to increased computer processing power. These factors together make it possible for anybody to build a "film studio", with modest investment.</p> <p>To prove my hypothesis, I set about making a documentary film with the slimmest of resources: a one-man team. As far as hardware, my production kit is built around the Canon EOS 5DMKII DSLR camera – the piece of equipment that has been key in the "DSLR revolution", if you like.</p> <p>The end result of this project is the documentary film "Three letters to a child" – which I wrote, directed, shot, edited, color graded, sound designed and composed and produced music for. While "professional quality" is a subjective term, initial reactions to the film are such that it indeed seems that producing professional quality cinema with mid-range technology is indeed possible.</p> | | |
| <i>Keywords</i> Documentary film, DSLR video | | |

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Context

Historically, producing cinema has been a team endeavor. As is reflected in the word “director”, cinema is produced by a team of people, whose activity is directed by the team leader, or director. A film crew is typically comprised of specialists of different disciplines. A typical film crew typically comprises of people specialized in

- Lighting
- Cinematography
- Sound
- Set design
- Grip
- Direction

After film has been shot, the filmmaking process is roughly half way through. The production phase is followed by post-production, where again normally different specialists take on different tasks in order for the end result, the film, to be completed. Post-production professional roles include, but are not limited to:

- Editing
- Sound design, sound post-production
- Music (composition, performance, production)
- Visual effects
- Color grading

Up until relatively recently, producing cinema that has such production value that it can be viewed as meaningful art, has been difficult if not impossible without such a team of specialists. Granted, this is not always the case. Short films, avant-garde art pieces, documentaries and other types of film that have artistic value have been produced with miniscule resources. However, it is fair to say that most of the cinema that is consumed is typically produced by such specialist teams of people.

Recent developments are changing this landscape. At least two parallel developments are making cinema production more accessible to large audiences. These are:

1. Hardware digitalization
2. Increased computing processing power

Hardware digitalization, with regards to cinema in this context, refers to developments in digital camera and sound recording equipment. While digital cameras have been around for quite some time, very recent disruptive developments have shaped the cinematography landscape in a profound way. The one chief development in this regard is the emergence of DSLR cinematography.

DSLR (Digital Single Lens Reflex) cameras are originally photography cameras. They employ a large mirror that reflects incoming light onto a film or sensor surface, allowing light to be recorded as a photograph. It can be assumed that the original developers of DSLR cameras never intended these devices to be used for anything else but still photography. However, video is a prominent use for these devices today. The reason for this is the digitalization of these cameras: as these devices were digitalized (i.e. they were equipped with digital processing and storage units) it is now possible to take very many pictures within a short amount of time. As moving images, be they film or video, are nothing but a succession of still images, DSLR cameras have essentially become video cameras overnight.

The remarkable aspect about DSLR video emerging is the unsurpassed optical characteristics of these cameras. Originally high-end still cameras, DSLR cameras have various advantages over “regular” video cameras:

- Sensor size: the light-recording surface area is typically larger in a high-end DSLR camera than in a regular video camera.
- Compatibility with existing camera accessories, most importantly lenses: this allows capturing incoming light using high-end optics, typically impossible with regular video cameras¹.

These factors, in addition to others (e.g. image processing algorithms employed within different cameras), make possible videography that is similar to film in terms of visual aesthetic qualities. A much-coveted and often referred aesthetic feature to this extent is shallow *depth of field (DoF)*. DoF refers to the difference in terms of focus of objects in focus and those out of focus. As an example, people in close-up shots in films are typically in focus, while their background is blurred, or out of focus. While it is possible to achieve this effect in post-production, most typically this often desired effect is generated while shooting, by means of controlling lens aperture and focal range. Aperture refers to the size of the opening in the lens allowing light in. The more open the lens (the wider the aperture), the more light is allowed in from different angles. As more light rays from more angles hit the sensor (or film) inside the camera, the more material that has no distinct focal point is generated – i.e. the more objects that are not in focus are blurred. A shallow DoF refers to a large difference in terms of focus for objects that are in focus vs. out of focus. Shallow DoF is a much-desired effect, and it is often referred to as the effect that is chiefly responsible for generating what is commonly known as “the film look”, or an aesthetic differentiating video from film.



Figure 1: Shallow depth-of-field. Note how the foreground hand is in focus, while parts of the subject that are further away from the camera are increasingly out of focus (e.g. the tattoo on the left arm.)

¹ It is possible to use still photography lenses on traditional video cameras by means of adapters and other accessories. However, the combination of a good video camera, adapter unit and high-end lenses is most often so much more expensive than a DSLR alternative that the comparison is meaningless.

In addition to developments in the image capture arena, audio recording has also gone through significant changes over the last few years. Digital recorders now feature massive storage capacity compared to a few years ago. Also, digital audio recorders often feature integrated microphones, making the recording unit compact and highly portable.

In parallel with these cinematography-related hardware developments, developments in the computing arena have fuelled the accessibility of cinema production to large audiences. Computers in general are becoming more powerful (in terms of processing-power, measured e.g. as Millions of Instructions Per Second, or MIPS) while remaining affordable. Thanks mostly to this increased processing power, software developers continue to develop and launch affordable software products geared for cinema post-production tasks that can be run on regular personal computers². In notable cases, hardware-software –dependencies are being broken: situations where the purchase of certain software has necessitated the purchase of specific hardware have existed, but these ties are becoming increasingly unnecessary and subsequently are being broken. While examples of these ties being broken outside the field of cinema are abundant (e.g. the recent announcement of the iPad Lemur MIDI controller application by Jazzmutant), they fall outside the scope of this work. However, one notable case is directly relevant here and will illustrate this point most efficiently.

The Pro Tools audio recording and editing software was developed by UC Berkeley graduates Peter Gotcher and Evan Brooks. After previous incarnations (named “Sound Tools”), the first version of Pro Tools was launched in 1991. Pro Tools has historically relied on bundled hardware (such as DSP chips) to perform much of the computational tasks, and using Pro Tools software has necessitated the purchase of specific hardware. This made Pro Tools prohibitively expensive, and it is safe to assume that during its first years, Pro Tools was only in use in professional recording studios.

However, in 2010-11 the Pro Tools versions HD and LE were effectively merged into a hardware-independent software package. This means that it is possible to run Pro Tools on any compatible computer, without purchasing any additional hardware. Pro Tools 10 is priced at €678,- today, making it accessible to large audiences. The example of Pro Tools exemplifies the case where

1. The braking of hardware dependencies
2. Increased computing power

are making serious production and post-production tasks in the audiovisual arena accessible to large audiences.

In plain English: acquiring the necessary hardware and software for cinema production and post-production has become possible for large audiences. Depending on specifics and user preferences, an initial investment of less than € 4,000 can get one started. Regarding the topic of this paper, two example set-ups that would enable the producing of cinema, roughly similar in terms of technical quality to the film forming the production part of this thesis, are presented.

Example set-up for production and post-production: low end

| | Price € ³ |
|----------------------------|----------------------|
| Production hardware | |

² The term “personal computer” in this work refers to an affordable computer unit that is typically used for various different tasks, in contrast with specialized “workstation” or “server” and other types of computer. The term here does not refer to the type of operating system of the computer (e.g. Apple OS X, Microsoft Windows or others).

³ at march 8, 2012: based on prices at shop.humac.fi, rajalacamera.fi, thomann.de and Apple App store.

| | |
|--|---------|
| Camera: Canon EOS 550 D kit | 549 |
| Tripod + head: Manfrotto 546GBK + 501HD + MBAG90PN | 695 |
| Audio recording unit: Zoom H4n | 298 |
| Directional microphone: Rode NTG-2 | 195 |
| | |
| Post-production hardware | |
| Apple iMac 2.5GHz | 1179 |
| Behringer B3031A Truth | 359 |
| | |
| Post-production software | |
| Apple Final Cut X | 239.99 |
| Logic Pro 9 | 149.99 |
| TOTAL cost | 3664.98 |

Example studio set-up, mid-range

| | Price € ⁴ |
|--|----------------------|
| Production hardware | |
| Camera: Canon EOS 5DMKII (body only) | 1799 |
| Tripod + head: Secced Reach 3 set | 1537.50 |
| Audio recording unit: Zoom H4n | 298 |
| Directional microphone: Sennheiser K6/ME66 | 404 |
| Rig: Dynacam | 1500 |
| Follow focus: Chrosziel | 1100 |
| Lenses | |
| CANON EF 24-70/2.8 L USM | 1199 |
| CANON EF 50/1.2 L USM | 1649 |
| CANON EF 85/1.2 L II USM | 2299 |
| Lighting: Sachtler Reporter 300H | 2200 |
| | |
| Post-production hardware | |
| Apple Mac Pro | 3000 |
| Genelec 6010A | 1918 |
| KRK 10S | 435 |
| Room correction system: KRK Ergo | 585 |
| | |
| Post-production software | |
| Apple Logic Studio | 500 |
| Apple Final Cut Studio | 500 |
| Adobe After Effects | 1000 |
| TOTAL cost | 21,923.50 |

The production part of this thesis was produced with the above-described “mid-range” example set-up.

⁴ Prices are approximate – some products (e.g. Apple Final Cut Studio) are no longer available. Sources include: suomilammi.fi, shop.humac.fi, thomann.de, rajalacamera.fi.

The hardware revolution: DSLR, digital audio recording

The other major trend besides the one regarding the availability of software (discussed above) making cinema production more accessible and widespread is developments in production hardware.

Cinema production, in very simplified terms, refers to the capturing of moving images and audio. These two functions, while closely linked, are oftentimes separate so that separate equipment and personnel are used for image and audio capture. This is understandable, as a specific piece of hardware is often designed for some specific purpose, and does not necessarily include any other functions. As an example: a cinema camera typically will only capture images and no audio at all. Similarly, audio recording devices don't usually take pictures – why should they, they are audio recording devices and not cameras?

Probably the most important development in recent times regarding accessibility of cinema production hardware has been the emerging of DSLR video. As discussed previously, DSLR video has its origins in still photography. As still cameras were digitalized, the ability to take very many pictures fast was added. In other words, video recording became possible. As DSLR video cameras were really higher end still cameras originally, the captured video has aesthetic qualities similar to still photography – or to film. These qualities are subjective. A vibrant discussion exists on the topic of “the film look” – or what makes any video (not only DSLR) look like film. The expert consensus here seems to be that no one single factor can make video look like film – as with any cinema production, it is a question of composition, subjects, lighting, colors, distances between objects, the specific action taking place in the scene, and many others, that make moving images look like a professional production. However, two factors that are often discussed come to fore:

1. Depth of field
2. Low light capability

Depth of field

Depth of field (DoF) refers to the difference, in terms of focus, of in-focus and out-of-focus objects in a frame. In other words, objects that are in focus are very sharp, while objects that are out-of-focus remain blurred. This aesthetic is very prevalent in professional cinema productions. Take any close-up shot of a person (or some other defined object) in a high budget film, and it is near guaranteed that the object is in focus while the background is not. DoF is used in this way as a story-telling mechanism: as the object is in focus and everything else is not, viewer attention is drawn to the object. Here, DoF has a similar function to picture framing or composition: close-up shots are used to draw viewer attention to something. DoF can, and is being used, in a similar way.

Unlike composition and framing, careful use of DoF will allow moving viewer attention within the same composition. As DoF will allow different elements in the composition to be in or out of focus, it is possible to move objects in and out of focus during a shot. As an example, let's imagine a close-up shot of a person's face. The person is in focus, but we can see another person beside the first one, behind him, out of focus. Our attention here would be drawn to the person that is in focus. Now the focus moves so that the second person becomes in focus, the first one moving out of focus. Our attention would be drawn to the second person.

The moving of focus within a shot is referred to as “pulling focus”, the procedure “rack focus”, and the equipment allowing this “follow focus”. Rack focus is an important story-telling mechanism in cinema, and it requires DoF. So, cinematic storytelling has clearly become increasingly available with DSLR video, as DoF capability (or lack thereof) is one distinguishing feature separating DSLR video cameras from conventional video cameras.

The reason why DSLR video cameras have extensive DoF capability has to do with their still-camera origins. DSLR video cameras typically feature large image sensors – this allows more to be included in a frame with a given focal length and aperture. Therefore, more objects that are not in focus are included in the frame; therefore a shallower DoF can be achieved than with a smaller sensor (see e.g. <http://www.cambridgeincolour.com/tutorials/digital-camera-sensor-size.htm> at March 22, 2012).

Low-light capability

Another distinguishing factor besides DoF capability separating DSLR video cameras from conventional video cameras is low-light capability. Due to their still image origins, DSLR cameras typically feature large image sensors. The size of the image sensor is directly related to how much light the camera needs in order to record images. A full-frame sensor, such as found on the Canon EOS 5DMKII DSLR camera, needs minimal light as compared to a conventional video camera, to record video. As an example: typical street lights on a city street in an otherwise pitch black night are enough for the 5DMKII to record video. This amount of light would be insufficient for most any other type of camera (film or video) to record images, at least without introducing significant noise in the end product⁵. Vincent Laforet, the cinematographer known for advocating DSLR video, has mentioned that professional cinematographers found it very hard to believe that he didn't use any additional light in his breakthrough short film “Reverie”.

While “amazing low-light capability” seems to be a feature of every video camera out there, judging from advertising, a good DSLR can outperform most other types of cameras in terms of low-light capability. I've personally shot video that was lit with one candle in an otherwise pitch black room (bathroom without windows) without adding significant noise to the material – I would like to see similar results from any other type of camera in the same price range.

So, as the low light capabilities of DSLR cameras make it possible to shoot in conditions that

1. would otherwise require significant investment in terms of lighting equipment and personnel, or
2. would remain unfeasible to shoot in altogether

it is clear that the low-light capability of DSLR cameras has been a major contributing factor in making cinematography available to large audiences.

Relevant developments in the digital audio recording area

While digital audio recording is nothing new, relatively recent developments in this area have made cinema production more accessible, in addition to developments in camera hardware, discussed above. Field

⁵ In case there is otherwise insufficient light, the incoming signal in a video camera can be digitally amplified. This may allow shooting in otherwise insufficient light – however, as the incoming signal is digitally manipulated, digital artefacts, or noise, are introduced. The more the signal is amplified, the more noise – resulting in some cases in so noisy material that is essentially unusable.

recording in cinema production often involves recording sound sources that are complex and low level. A good example of such a sound source is room ambience.

If one should ask a random person what they hear when sit in a quiet room, they'd probably say "nothing". However, no room is totally silent (with the exception of rooms that are specifically made to be totally silent, e.g. anechoic chambers⁶). Room ambient sounds include noises from plumbing, electrical appliances, sounds from outside sources (e.g. traffic hum), and others. Capturing room ambience (or generating it at some point during the production or post-production phases) is essential. In a film, a silent room can't be totally silent (unless specifically used for dramatic effect).

In addition to the need to record complex, low-level sources such as room ambiences, cinema field recording poses other challenges that have relevance with regards to the choice of recording equipment. Because films are seldom shot in one location only, field-recording equipment needs to be portable. Also, equipment should be battery-powered, as electricity is not necessarily otherwise available (e.g. outdoor shots).

So, a good cinema field-recording device is lightweight, portable, battery-powered and high quality in terms of recording capability.

While digital field recording has been a fact of life at least since the 1980's since the arrival of DAT (Digital Audio Tape), it is the latest generation of field recorders that are the most portable. This is due to the storage medium being hard disk- or Flash-based. The audio recording device used in this production is a Zoom H4n, which weighs a measly 280g. The Zoom captures up to 24-bit 96 Khz PCM audio in what in my personal opinion is more than sufficient quality for projects like the one discussed in this paper.

The development towards small, portable, lightweight, good quality audio recorders has undoubtedly made cinema production more accessible than before.

The community aspect

Based on sales of DSLR equipment alone, clearly it must be the case that cinematography as a livelihood and as a hobby is growing. Besides supply-side factors such as the hardware- and software developments discussed previously, demand for professional cinematography services is growing. This is mostly due to the increasing audio-visual nature of the Internet. It is now easier than ever to commission and deploy professional-quality productions to promote products, services and non-profit initiatives. This has most probably led to an increase in demand for audiovisual productions in recent years. While definitive statistics on this trend are hard to come by, probably a meaningful proxy to this end would be growth of video-sharing services. In five years after it's 2005 launch, YouTube exceeded an average of 2 billion views per day in 2010 (<http://www.website-monitoring.com/blog/2010/05/17/youtube-facts-and-figures-history-statistics/> at March 22, 2012).

The cinematography trend has probably led to people who have no formal training in the field starting to make movies, be they commercials, web adverts, "proper" cinema or other type of moving picture. There is demand for advice and information. I'd like to suggest that in addition to hardware- and software developments as well as demand-side factors, another major contributing factor to the cinematography trend is Internet communities. Various fora exist where advanced hobbyists, professionals and other experts share advice with those who

⁶ A room specifically designed and built to stop reflections of either sound or electromagnetic waves. Anechoic chambers are typically used for conducting acoustic experiments.

need it. Making movies is a fairly complicated process, and it is fair to say that without respectable knowledge, it would be impossible to produce cinema that would generally be regarded more than amateurish.

As examples let's look at two such community services: Vimeo and Creative Cow.

Vimeo is a video-sharing service that differs from some other similar and popular services. Undoubtedly, Vimeo was designed from the outset to be a platform for the sharing of quality work by people who are enthusiastic about cinematography and things related to that (e.g. audio engineering for film). While it is possible for anyone to create a Vimeo account and start sharing their work on the service, much attention has been paid by Vimeo to ensuring that work that is most easily accessible and visible is of very high quality.

Vimeo is organized into different sections: categories, groups and channels. While these sections are set up to organize work differently, each one is similar in that whichever category, group or channel a visitor may be browsing, work that is first displayed tends to be of high quality. This is partly due to a moderation system, where Vimeo staff experts have a say on the order in which work is displayed.

In addition to being a great source of inspiration, Vimeo provides lots of factual advice to the aspiring cinematographer and director. A rich forum exists, where users can request and exchange information with other members and Vimeo staff. Also, Vimeo maintain an educational section, "the video school", where instructional videos on various cinematography topics are available, sorted on the basis of difficulty level.

All and all, Vimeo provides a source of information, inspiration, networking and a platform for sharing one's work for any cinematographer or director.

Another major community service is Creative Cow (www.creativecow.net). Broader in scope than Vimeo, Creative Cow hosts a multitude of forums around new media production, including but not limited to motion graphics design, image processing, audio engineering, illustration, color grading, digital media compression, as well as cinematography.

Creative Cow is moderated and participated in by topic experts. In my experience, getting relevant answers to even very complex technical questions seldom takes more than 24 hours. As an example: a while ago I asked about a specific color artefacting problem on Canon 5DMKII footage – colorful lines appeared on captured footage in areas where dense horizontal lines were filmed (a ventilation grill, in my case). The next day a Creative Cow expert replied and explained that what I was seeing was the Moiré pattern, or artefacting due to aliasing, or incorrect sampling by the camera. This phenomenon is inherent in all digital sampling systems (not only digital cameras), so basically I was doing nothing "wrong". Figuring this out by myself would have been impossible, but armed with this expert advice I now know how to prevent ruining footage by paying special attention to Moiré-prone subjects when shooting.

Especially considering that equipment manufacturers seldom tend to discuss product weaknesses and general challenges in the readily available product documentation, access to expert advice is crucial for anyone aspiring to undertake professional-quality cinema production. Things will not always work the ways they're supposed to, and oftentimes product documentation will not help. It is clear that expert community services such as Vimeo and Creative Cow play a crucial role in making the production of professional-quality cinema more possible.

These supply- and demand-side factors have led to today's situation, where producing professional-quality cinema is more possible than ever, considering easy and affordable access to technology as well access to relevant advice and information.

Definition of work and solutions

The motivation behind this project is two-fold. Firstly, I was very interested in producing cinema due to a need for such artistic expression. Probably this project would have happened regardless of me being a student or not. Secondly, I was interested in finding out *whether producing professional-quality cinema is possible using mid-range technology only*. The latter motivation forms the definition of work discussed in this paper; it is the "research problem" as it were.

Definitions regarding the research problem are as follows:

- "Professional-quality cinema": by this I mean a cinematic work that is broadcast-worthy; the subjective quality is sufficient for the work to be considered for broadcast in arenas where cinema is typically broadcast. These arenas include television broadcast and film festivals.
- "Mid-range technology": this refers to production and post-production technology that is accessible without the need for considerable monetary resources. In the interest of forming a more specific definition, let us agree that such mid-range technology is characterized by:
 - Camera equipment (body + lenses) typically costing under € 10,000
 - Other production hardware (e.g. tripods, external monitors, audio recording units, microphones) typically costing under € 5,000 altogether
 - Central computer unit (housing post-production software) typically costing under € 5,000
 - Post-production software suite (editing, color grading, VFX, file compression and management) costing typically under € 3,000 altogether

While the above definition of mid-range technology is relatively generous, it does exclude typical set-ups used for producing most commercial cinema today: as an example, most professional-grade digital cinema camera bodies cost well over € 10,000; a professional fluid-head tripod can easily cost close to € 10,000. The aim of the above definition is to narrow down the discussion into a typical indie production set-up, where the (main) camera body is probably a DSLR video camera, such as a Canon 5DMKII or 7D. The set-up used for the production of the film discussed in this paper falls within the above definition of mid-range technology.

The following sections in this chapter is structured per the workflow for producing cinema, starting from pre-production, moving through production and post-production, and finally ending in promotion and distribution.

Pre-production

It is commonly agreed that cinema is about storytelling. All the technology required is only a means to an end: they are aids that help the director tell a story. It is fair to say that the story (in a broad sense) is the most important ingredient of any film. In this project also, everything started from a sense of a story that I wanted to tell, rather than that of a film that I wanted to make. Due to my personal life situation, I've come to contemplate childlessness from many perspectives. I don't have children of my own, but my wife's son lives with us half the time. Some friends of mine are approaching middle age and some are suffering from not having children.

During my contemplations of childlessness in general, I came to the realization that most often childlessness is seen as a problem for couples or women – very seldom, if ever, is childlessness discussed from the point of view of men. However, the time is ripe for discussing men and their feelings very openly: as an example, the recent hit documentary “Miesten vuoro” (“Steam of life”) discussed the feelings and experiences of men in a very candid way.

I came to realize that there is an untold story that needs to be told. The story is feelings of childless men with regards to having children. My hypothesis upon starting the project was that also men feel longing, hope, disappointment, fear, and other feelings with regards to having children. They too think about having children, and what not having children means to them.

Planning

After feeling that I have a story worth telling, I begun contemplating how to best tell the story in practice. I was painfully aware of my limited resources especially in terms of money and manpower, so I begun to formulate a plan that would allow me to tell this story with minimal resources. It was soon evident that I couldn't have very many characters in my film, and that it would be best the characters appear one at a time. The complexity of cinematography would increase substantially the more characters there are in a scene. This is easy to grasp as we consider the easiest shot to shoot in terms of characters: a single, stationary person. More people in a scene would necessitate the moving of focus (panning, tilting, pulling focus) between characters. Likewise, each person's voice would need to be recorded (in the shoot or afterwards) – more people in the film would increase audio production complexity.

Due to the above reasons, I decided that my film would consist of interview-like scenes with a limited number of people. This would allow me to shoot stationary shots without the need for elaborate camera moves; also this would allow me to record audio using a single (lavalier or shotgun) microphone.

Considering the above and the subject of the film, I decided that I needed a minimum of three characters in the film, in order for it to ultimately consist of different perspectives on the matter.

With this vague idea for a film, I set about recruiting the characters.

Participant recruitment

I set up a web page describing the project in general. The page discusses myself, my motivations for doing the film, as well as the envisaged distribution and publicity, and asks for people who'd be interested in appearing in the film to contact me directly. Then, I started advertising the page on various forums in a continuous effort. These forums included:

- A classified ad in Helsingin Sanomat
- Direct contact with citizen organizations relevant to the topic:
 - Simpukka Ry (organization for childless people)
 - Miessakit Ry (organization for men, addressing a broad array of issues specific to men)
 - Seta Ry (organization for gay/lesbian/transsexual rights)
- My personal contacts: friends and acquaintances
- My broader social circle: Facebook
- Contacts of the above two (i.e. my extended social circle)

To my great surprise, this relatively massive campaign resulted in nothing at first. Initially, I only managed to recruit one person, a friend of mine. After a few months had passed, another suitable character came onboard through a friend of my wife. After several months into the recruitment phase, the third character joined the project after having seen my post on Seta Ry's Facebook wall.

Production

After recruitment was finally completed, production could start. After the excellent advice from Virpi Suutari (one of the advisors in this project), I first set up lengthy interview sessions with each character. In these sessions I only recorded audio of their voices speaking. The reasons for this were several. Firstly, I wanted to explore the men's feelings and thoughts very broadly, in order to understand their personal perspective with regards to the topic and to understand it more broadly myself. Secondly, I wanted to get to know the two people that were previously unknown to me. Also, I wanted to ease everybody into the production: as I probably thought correctly, talking first and filming only later results in more relaxed, natural appearances in front of the camera by the characters. Further, I wanted to scout the possible locations where I could later shoot video.

In the interviews, the three people turned out to be an excellent and diverse mix of people. Each one had a different perspective with regards to the topic. Also, as people, the three were very different. From the initial interviews on, I had a strong feeling that the stories of these three people are such in their diversity and fullness that they'd give me ample substance to explore and discuss childlessness from the point of view of men. Each person turned out to be deep in thought and verbally talented; thanks to this fact, I was able to record some three hours of meaningful audio material in the initial interview sessions only.

From the very start of the project, I always had a strong vision that the detailed story will unfold in discussions with the characters. After all, the approach is that of telling a universal story through the thoughts and feelings of these individual people - so the detailed substance is that of their experience. Further, this is a documentary film: a script can't exist in the way it does exist in fiction cinema.

In order to explore and fully understand these initial discussions, I copied them on my mobile phone and other devices and burned a CD. I then went on to listen to them several times, during a period of a couple of months. Then I felt I was ready to move on to the next phase in the production: shooting video.

Choice of camera: DSLR cinematography

Considering my motivation of finding out whether producing professional-quality cinema is possible with mid-range technology, it was clear from the outset that I wanted to be able to produce a certain visual aesthetic in the project: such that it resembles mainstream cinema⁷ as closely as possible. This objective was always subordinate to the greater goal of telling a story. In other words, it was clear that decisions regarding cinematography would be made so that I'd first think about what I wanted to tell *and only then* attempt to tell it in a fashion where I'd produce a visual aesthetic similar to mainstream cinema: if this aesthetic wouldn't directly benefit the telling of the story, I'd be ready to reject it in favor of some other technique that would serve telling the story better.

⁷ By "mainstream cinema" I mean professional cinema productions that are typically screened in movie theatres and/or television.

From the outset, I had three major features of “a mainstream cinema-like visual aesthetic” (later: “film look”) in mind:

1. Shallow depth-of-field (see Depth of field, above)
2. Lighting that would make use of big contrasts within the frame: specifically, I had such lighting conditions in mind that would allow me to shoot people’s faces so that one part (side) were completely lit (exposed), while the other part (side) would remain totally unlit (many video productions tend to be evenly and strongly lit, therefore such contrasty lighting is a film-like visual aesthetic, and as such it is a factor that separates it from video)
3. Rack focus, or the changing of focus within a shot

Considering the depth-of-field and monetary constraints (as reflected in my interest in “mid-range technology”), the most obvious choice for best results is a full-frame DSLR camera. DoF is inversely proportional to the size of the imager, i.e. a larger sensor will make shallower DoF possible. How this happens is both interesting and sometimes confusing: actually the size of the sensor doesn’t directly affect DoF – only aperture and focal length do. However, a larger sensor will allow for photographing a larger area from a shorter distance. Hence, sensor size has an effect of how a picture can be framed from a given distance; and, in this way, it will affect focal length, which in turn will affect DoF. Given my desire for a film look and budget constraints a full-frame DSLR camera was an apparent consideration. Most cameras that are able to produce similar results in terms of DoF tend to fall in the high-end category.

Considering that I was going to shoot as a one-man team, it was clear that would benefit most from a camera that had good low-light capability, considering my goal of shooting contrasty shots.. The sweet spot in terms of price and low-light capability at the time (summer 2010) seemed to be the Canon EOS 5DMKII. Again thanks to its full-size sensor, it has excellent low-light capability. The downside of the large sensor is rolling shutter problems⁸ (particularly skew), as the camera is unable to record all information hitting the sensor in a timely manner. However, in the case of an interview-based documentary film, I decided that low-light performance would outweigh (possible) rolling shutter problems: I knew that due to the atmosphere that I was aiming to create, I was unlikely to ever utilize very quick camera moves, thus rolling shutter problems seemed unlikely.

The third major factor contributing to a film look was rack focus, or the changing of focus during a shot. To this end, it was clear that two things were needed:

1. Accurate monitoring of focus
2. A mechanism to pull focus when shooting

With the 5DMKII, the image being shot is displayed on the camera’s LCD screen. While this is sufficient for most shots in terms of judging exposure and framing, due to the screen’s small size it is very difficult to see whether a particular element in the shot is exactly in focus or not. Considering that I was shooting a documentary film, I was going to be shooting subjects (people) that would be moving in ways that wasn’t planned. If I wanted to pull focus and shoot at the same time, it was evident that I needed a very accurate way to determine focus when shooting, and that the camera’s own LCD screen wasn’t going to cut it.

Fortunately, the 5DMKII features various video outputs, including HDMI out. This means that using an external monitor becomes possible. I opted to invest in an external monitor that would specifically be useful in pulling focus. To this end, I chose the Marshall V-LCD70XP-HDMIPT. This monitor features a peaking filter, and aid to obtain the sharpest possible picture. In the case of the Marshall, the peaking filter will display the image as

⁸ Rolling shutter refers to image acquisition where each frame is recorded by scanning across the frame. In some cases, particularly quick pans, this can cause the exposure being recorded incorrectly, as not all of the frame is recorded at the same time: the result is footage that doesn’t accurately represent what a human eye would have seen, i.e. skewed objects and wobble.

grayscale, but parts of the image that are in focus will have red colored edges. Thanks to this filter, it is relatively easy to pull focus without an extra person doing the pulling. An added beneficial feature of the Marshall that I made very much use of in the project is a false colors filter: an aid to judge exposure.



Figure 2: Juha-Pekka sitting up, with face in focus.



Figure 3: Juha-Pekka leaning forward, with face in focus.

In Figure 2 and Figure 3 we see two frames from the same shot, shot with a shallow DoF. As we can see in both figures, parts of Juha-Pekka's face is in focus, while the rest of him is not, and the background is quite blurred, i.e. the shot features shallow DoF. In Figure 2 Juha-Pekka is sitting up, while in Figure 3 he is leaning forward, his face considerably closer to the camera. Considering the very shallow DoF (as seen in the focus difference between e.g. shoulder and eyebrows), pulling off this shot without a peaking filter would have been close to impossible.

While the Marshall monitor made it possible for me to judge which parts of the image were in focus, I still needed a physical mechanism for doing the actual pulling of focus (i.e. the turning of the focus ring of the lens while shooting). To this end, I purchased a Chrosziel follow focus unit: a piece of hardware that sits between the camera rig and the lens, enabling the turning of the lens focus ring by means of turning a vertically mounted wheel that is in contact with the lens ring.

In addition to the camera body and a solution for rack focus, a very important consideration remains: how the incoming light hits the camera sensor, i.e. the choice of lenses.

As the 5DMKII was becoming the evident choice for camera body considering what was discussed above, I was essentially faced with the question of which Canon lenses to use. In a way fortunately to me, this is essentially a choice between two options: the L-series versus non-L-series.

The Canon L-series lenses are Canon's flagship range. L-series lenses feature glass (rather than plastic) lenses and metal (rather than plastic) construction. Due to the actual lens pieces being made out of glass rather than plastic, the captured images tend to be superior in terms of quality, compared with images obtained with plastic lens objectives. According to Shane Hurlbut, cinematographer ASC⁹ and a prominent figure in the DSLR cinematography scene, the Canon L-series lenses are a serious choice to consider when shooting for the big screen (<http://www.hurlbutvisuals.com/blog/2010/02/06/still-lenses/> at March 22, 2012).

As the L-series of lenses seemed an obvious choice considering the film look goal, the only remaining question with regards to camera hardware was which specific lenses to choose.

DSLR lenses are of the zoom or prime lens variety. In a zoom lens, the focal length can be changed, whereas in a prime lens it is fixed, by definition. Due to this functional difference, zoom lenses contain more glass than prime lenses do: this means that light has to pass through more glass before it will hit the sensor. The result of this is that shooting with prime lenses tends to result in higher quality images than is the case when shooting with zoom lenses. Of course, the benefit of zoom lenses is that the focal distance can be changed – in functional terms, zoom lenses offer many prime lenses contained within one lens body, which practical benefit makes them a good choice in some cases.

As an implicit goal in the project was the producing of the highest possible quality images, I opted to shoot with Canon L-series prime lenses whenever possible. However, due to budgetary constraints, I chose to include one zoom lens in my kit (so as to avoid having to purchase or rent several prime lenses). The lenses used in the project included:

- Canon EF 24-70mm f/2.8 L USM (zoom)
- Canon EF 50mm f/1.2 L USM (prime)
- Canon EF 85mm f/1.2 L II USM (prime)

Based on my previous experience with television production, I knew that this collection would cover my needs as far as focal length very well. While shot sizes can be divided in several categories (e.g. a six-category division from extreme long shot to extreme close-up), from experience I knew that I would be covered quite well in terms of lens choice for any shot size. Namely, according to my previous experience, I knew that a meaningful division of shot sizes is three broad categories, and I knew which focal lengths would be appropriate for these categories:

⁹ The American Society of Cinematographers – a US non-profit association dedicated to advancing the art of filmmaking.

- Wide shots: 24mm
- Medium shots: 50mm
- Close-ups: 85mm

Of the three broad categories, I expected wide shots to account for little, as characters (rather than e.g. landscapes) would be central in the film (therefore necessitating many medium- and close-up shots). Therefore I knew that my choice of lenses would be ideal in the sense that I would be covered practically for any shot size *and* that with that choice of lenses, I would be shooting mostly with prime lenses (best quality).



Figure 4: A little-used shot size in the film (wide shot).



Figure 5: A typical shot size in the film (close-up).

Digital audio recording with no dedicated sound personnel

A consensus amongst hobbyist and professionals alike is that in order to produce professional-quality cinema, audio recording needs to typically be done on a unit separate from the camera. Most “real” cinema cameras don’t feature audio recording at all, and those that do often deliver quality that is unacceptably low for anything more than producing a track used for later syncing (“scratch track”) and other such post-production purposes (see e.g. <http://www.sounddevices.com/notes/cameras/red-one/> at March 22, 2012). From the outset it was clear that I would be recording audio on a separate unit, with quality microphones.

My audio recording needs fell into three broad categories in the project, in terms of sound source:

1. Dialogue
2. Live action
3. Ambience

Considering what needed to be recorded, I decided that the optimal choice for recording audio would be a unit that would enable:

1. Recording lavalier microphone input (mono, dialogue)
2. Recording directional (shotgun) microphone input (mono, live action)
3. Recording stereo input (stereo, ambience)

Considering the above, I opted to use the Zoom H4n portable audio recorder (integrated stereo microphone), and the Sennheiser MZA 900 P (lavalier) and Sennheiser K6/M66 (shotgun combination) microphones.

Normally, live action audio and some of the dialogue would be recorded on the shoot by a boom operator by means of a directional (shotgun) microphone. Since I was a one-man team, I decided to overcome this by directing the shotgun microphone by means of attaching it to a microphone stand, and moving the microphone from one shot to the next. I also recorded all of the dialogue with a lavalier microphone, as placing the shotgun microphone close to the characters’ mouths would have been impossible (I couldn’t place the microphone over their heads, as would have been done by a boom operator). Therefore, the shotgun microphone was only used to record live action audio (e.g. footsteps, pen scratching paper etc.).

Lighting

Considering the many limitations including manpower and budget, I knew that I would mostly have to manage with available light. However, I also knew that not every shot that I wanted to shoot would be possible to shoot with available light only. I envisaged situations where I would need to amplify available light by means of adding an extra light. As this thinking meant that I wasn’t aiming to create scenes by means of lighting them entirely, but only to provide enough light to be able to shoot anything, I knew that a few relatively small spotlights would be enough: this way, I could light the subject from the direction of the already available light and so have enough light, while maintaining the look of the set as it naturally appears.

Considering my lighting needs discussed above, I opted to include some 300W spotlights with dimmers in the set, namely Sachtler Reporter 300Hs and FG Elektronik NS 3001 dimmers. This combination allowed me to amplify existing light precisely to the extent I wanted to. The below series of shots should illustrate my point.



Figure 6: Joni, in available light.



Figure 7: Joni, in available light plus a 300W dimmed spotlight on him.

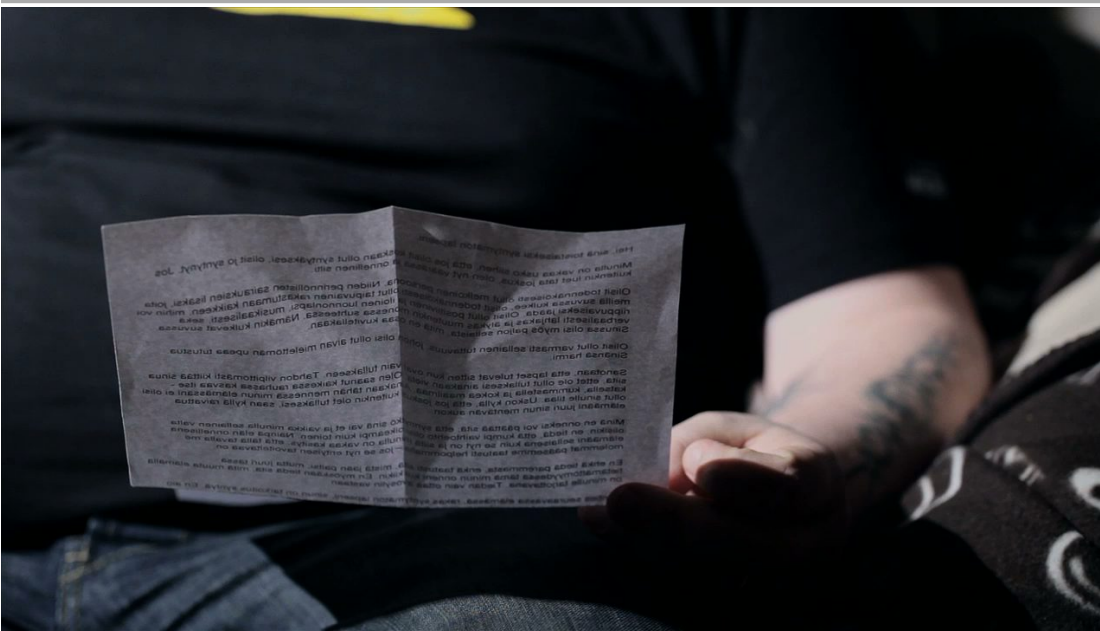


Figure 8: Close-up of Joni, in available light plus a 300W dimmed spotlight on him, dimmed less than in Figure 7.

See how the paper in Joni's hand is more lit in Figure 8 than in Figure 7. However, during the film there is an illusion of constant lighting conditions in the scene. By using my lighting hardware, I was able to choose from where and how much light hits the subject in each shot, and so create an illusion that everything was shot in available light, e.g. in constant lighting conditions, when in fact some shots were provided additional lighting.

Post-production

The 5DMKII captures H.264 video at max. 1080p frame size. H.264 is a highly compressed codec, not suitable for editing. This necessitated the conversion of all footage into an editable codec. Considering that I was going to do all post-production in an Apple environment, I chose the Apple ProRes codec for editing. The first step in the post-production phase then became converting all footage from H.264 to Apple ProRes, by means of Apple Compressor (included in the Final Cut Studio post-processing software suite).

As far as audio, the production phase resulted in a bunch of stereo files. While it is possible to record from a mono source with the Zoom H4n, I opted to record stereo only (i.e. in the case of a mono source the other track remained empty). The reason for this had nothing to do with audio as such but with the specifics of the chosen recorder (Zoom H4n).

The Zoom features level meters on an LCD screen. The meters are displayed horizontally in the case of stereo input, while they are turned in a vertical position when mono sources are being recorded. Due to the dimensions of the LCD screen, I found it hard to read the level meters when recording mono. Because of this reason, I decided to record everything stereo, and get rid of the redundant empty track in cases where the source was in fact mono (i.e. nothing was recorded onto the second track). I split these stereo files in Apple Soundtrack Pro and got rid of the redundant empty tracks. This way, I ended up with mono files in case of mono sources. Naturally, I didn't perform such an operation in the case when the source was recorded with the Zoom in-built stereo microphones.

Due to the nature of the project, it was always evident that I would be doing audio-video synchronization without any elaborate mechanism involving SMPTE¹⁰ or any other timecode. Dealing with timecode would have necessitated some means to feed the same timecode to the camera and the audio recording unit when shooting/recording. This would have over-complicated the production (and made it much more costly due to the equipment that would have been needed). Because of this, I from very early on decided to do audio-video synchronization by means of a scratch track only.

The 5DMKI records 48Khz / 16bit audio with its built-in microphone. In order to make use of this scratch track the easiest way, I converted all audio into 48Khz / 16bit AIFF. This allowed me to later place the scratch track and all separately acquired audio into the same NLE¹¹ project.

Once the material was prepared (codec conversions, stereo splits, audio conversions), editing could begin.

Audio-video synchronization

Synchronizing audio and video with the help of a scratch track can happen manually or automatically. A prevalent manual method involves the use of a clapperboard. When a shot is filmed, an assistant claps the board and this is shot on video/film and the sound of the clapper is recorded. The clapper sound is aligned with the correct video/film frame in the editing software, resulting in all subsequent audio in the shot being aligned properly with images.

However, using such manual synchronization methods is largely unnecessary today. Software solutions exist that can accomplish synchronization automatically in cases the captured footage includes an audio track (scratch track). As discussed above, the 5DMKI also records audio. Because of this, utilizing automatic synchronization became possible.

For synchronization, I used Singular Software PluralEyes, a piece of software that synchronizes separately recorded audio with a scratch track. The operation involves placing all video and audio footage onto an NLE timeline and running PluralEyes. The result of the operation is an NLE timeline where the separately added audio clips are aligned with the scratch track and hence with video footage: i.e. audio and video is synchronized.

¹⁰ a set of cooperating standards to label individual frames of video or film with a time code defined by the Society of Motion Picture and Television Engineers in the SMPTE 12M specification.

¹¹ Non-linear editing

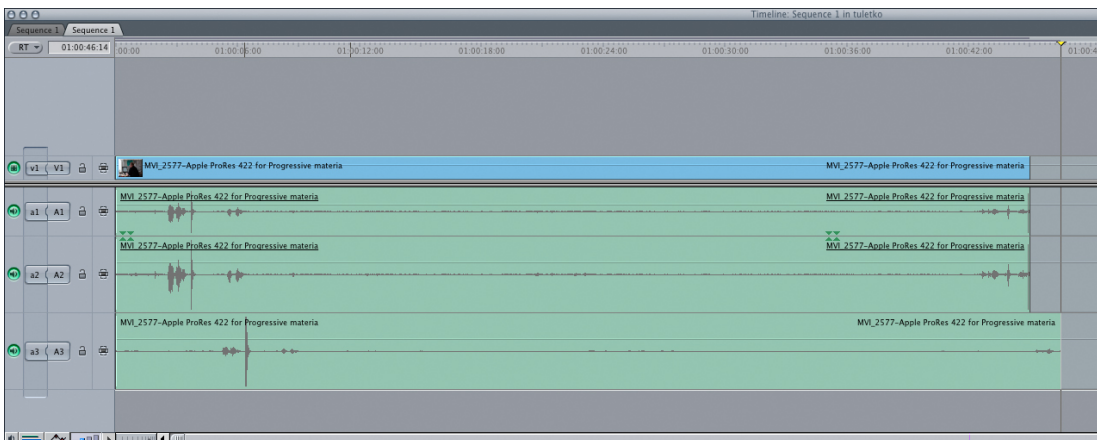


Figure 9: Video track (V1), scratch track (stereo: A1 + A2) and separately recorded corresponding mono track (A3) on an NLE timeline, un-synced. Note how the waveforms are not aligned.

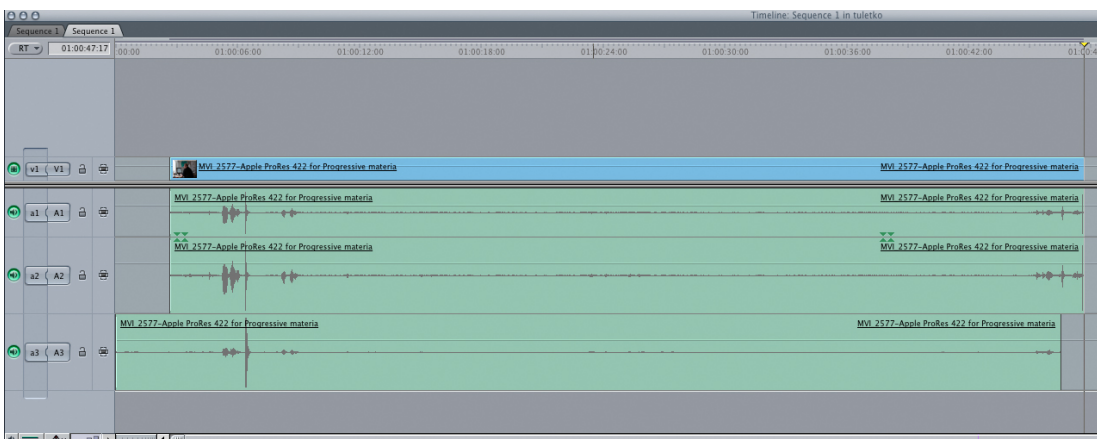


Figure 10: Video track (V1), scratch track (stereo: A1 + A2) and separately recorded mono track (A3) on an NLE timeline, after PluralEyes synchronization. Note how the waveforms are now aligned.

One more phase remained before actual editing could begin. The synchronized clips needed to be placed somewhere where they could be readily accessed for three-point editing (by way of setting In and Out points onto the source media).

Three-point editing refers to an editing technique where the desired duration for the clip is defined by means of an In- and Out point, and a third point is placed on the timeline to denote where the clip should begin or end (the technique can also be applied the other way round, where the In and Out points are set on the timeline and the desired beginning or end onto the source media clip). The result of the PluralEyes synchronization operation is a bunch of clips on the timeline with video and associated scratch track properly aligned with separately recorded audio (see Figure 10). This would allow editing on the timeline but not the other way around.

In order to enable the most convenient way of three-point editing, I linked every clip's scratch track and the corresponding separately recorded audio clip (if there was one), and placed the resulting clip (one video + three audio tracks) onto the NLE browser. This would allow me to later drag the synced clips back onto the NLE from the browser and perform three-point edits.

With the above maneuvers performed, material was ready for actual editing.

Editing

Editing is more of a creative rather than a technical process. As Pirilä and Kivi (2008) put it: “[the editor]...has to recognize the little streams of story in the footage, and assemble these together, to form a large stream that flows through the production.” (translation from Finnish by author). As the film was written, directed and shot by myself, I already had a rough idea in mind of how to edit the film from the outset. Therefore, editing remained a very mechanical phase in the project: I only assembled the pieces in the order I already had them in my mind.

A technical note on the editing phase is that I decided before a single shot was filmed that I'd be shooting in 1080p, while the end product would be 720p. A reason for this was that a larger size image acquisition format as compared to the delivery format allowed me to affect shot composition in post-production. Further, this choice allowed me to make camera moves in post-production. There are two such “artificial” camera moves in the film:

- pan at 1:44
- dolly track in at 6:48

Color grading

Color grading refers to adjusting image elements such as contrast, color balance and saturation, for consistency between shots, as well as possibly for the purposes of achieving a specific “look” (Apple Color documentation). Color grading was a very important phase in this project. There was a clear goal of producing a film look visual aesthetic, and the color grading is the post-production phase where most of the building of the look happens.

In order to be able to achieve a film look, I shot the footage with “super-flat” settings in the camera. I set contrast, sharpness and saturation deliberately low, so as to be able to manipulate these in the color grading-phase. This left me with enough headroom to achieve the look that I wanted. This allowed me to build a contrasty, de-saturated, sharp look with a hint of green tint, which was the objective. I determined this objective by considering the visual aesthetics of various reference films, particularly “Mies vailla menneisyyttä” by Aki Kaurismäki and “Auf Wiedersehen Finnland” by Virpi Suutari.

Sound post-production and music production

In addition to recorded dialogue and live action audio, there was a need for two additional broad categories of audio in the film:

1. Music and music-like sound design
2. Foley

Considering that I would be doing composing, producing, recording and audio post-production by myself, I decided that the optimal set-up would be an audio software package that would allow me to do all of the above within a single package. Therefore, requirements for the package included:

1. A good collection of software instruments
2. Good audio editing capability

3. Suitable sample libraries

In my personal opinion, based on experience, major audio software suites' strengths and weaknesses in terms of cinema audio post-production tasks include:

| Software suite | Strengths | Weaknesses |
|-------------------------|--|---|
| Avid Pro Tools | Varied audio editing capability on clip level (e.g. clip gain) | A focus on audio at the expense of MIDI |
| Steinberg Cubase | Varied audio and MIDI editing capability | Stability in an OS X environment |
| Apple Logic | Extensive software instrument collection and sample libraries; compatibility with Apple editing software (Final Cut) | Very cumbersome audio editing functionality |

Table 1: Strengths and weaknesses of major audio software suites with regards to cinema post-production.

Based on the above thinking, I chose to do all audio production and post-production within Apple Logic. The most important factor was compatibility with Final Cut: without a convenient way to transfer audio from within Final Cut, all the other potential benefits of an audio package became redundant. Because of this reason, I chose to reject Steinberg Cubase, which was a strong candidate partly due to my previous rather extensive history with that software. This decision was based on the fact that Cubase doesn't support Apple XML.

After having declared picture lock¹² to myself, I sent the Final Cut audio tracks into Logic by means of XML export. As both Final Cut and Logic are Apple products, the XML file exported from Final Cut imports into Logic without errors.

Besides audio from the film, I knew I would be adding sound design and specifically produced music in the post-production phase. To this end, I chose samplers and software instruments from the Native Instruments Komplete Ultimate bundle. The bundle features excellent tools for both music production and sound design. Specifically, the main tools used in this production include the Absynth 5 synthesizer for sound design, and Kontakt 5 libraries (specifically the Session Strings Pro library) for music production (discussion regarding aesthetic and artistic choices follows in later chapters). The end result, as far as audio post-production, was a relatively large Logic Pro session, with audio and instrument (MIDI) tracks.

¹² The point in the editing process when it is agreed that no more edits will be performed. The production is a "rough cut" at this point.

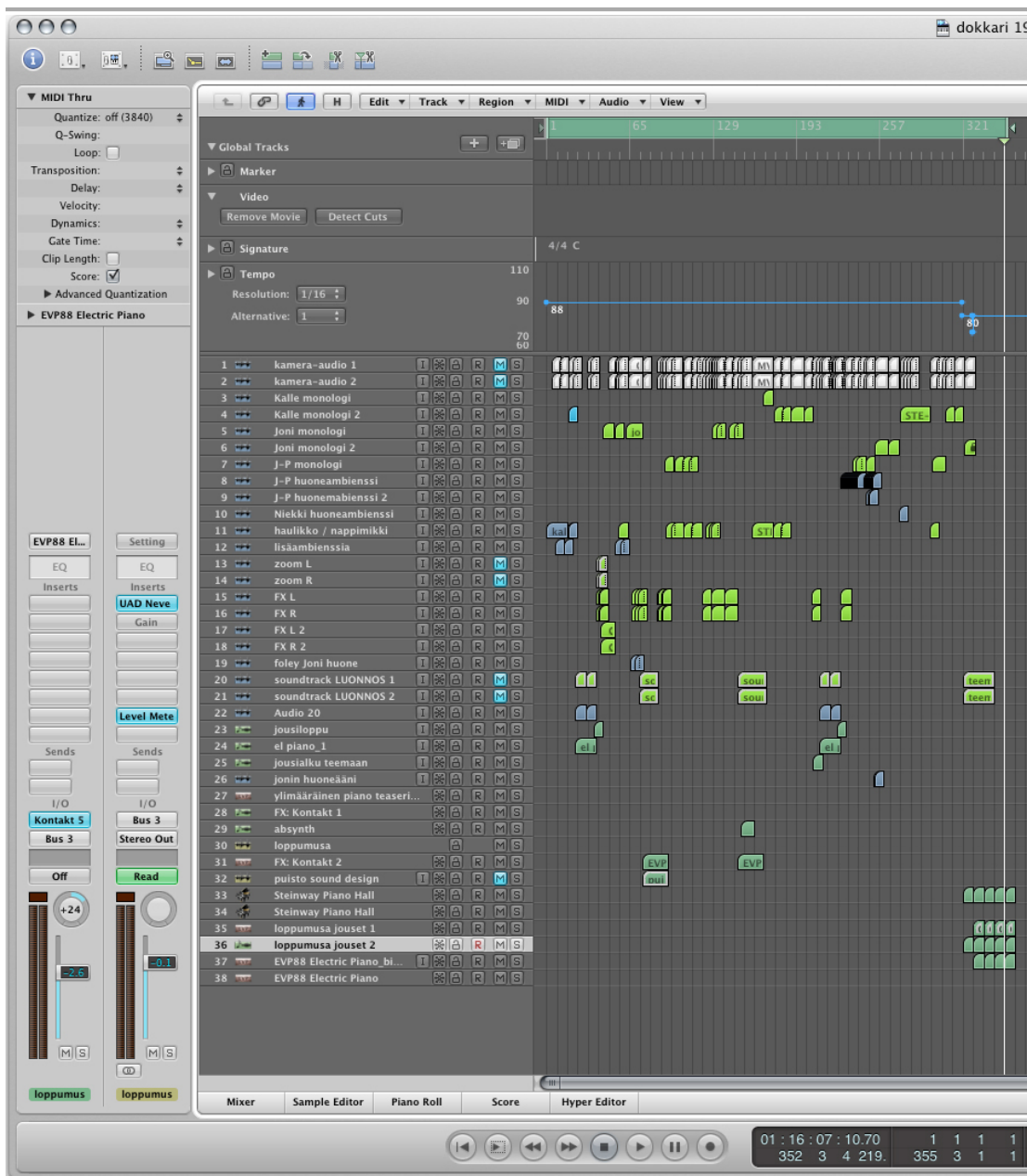


Figure 11: The soundtrack, Logic Pro session.

Promotion

As a filmmaker, I want to be able to present my work to an audience. The motivation for this has to do with artistic expression. I have no fantasies regarding recognition of any sort: but, this is a story worth telling, and a story is not a story is nothing unless there's somebody to hear (and in this case, see) it.

Considering the budget limitations and the fact that I have practically no personal contacts in the film industry or the scene around it, I've decided that the most efficient way to find an audience is to distribute and make the film available on the Internet. To this end, the following has happened to date:

- A promotional website is up at www.3kl.fi. The site provides some basic information about the film, and a trailer is available for viewing on that site.

- I've submitted the film to compete in Vimeo 2012 awards in the documentary film category. Even in the most probable case that the film doesn't get any recognition in the competition, the film is likely to gain some audience that would otherwise have never heard of the film.

Further plans for promotion include:

- An invitational screening in Helsinki, Andorra Kino, Apr 13. In addition to friends, I will invite relevant representatives of the press with the hopes that somebody will cover this project in an article in a Finnish newspaper or magazine; this would result in reaching yet new audiences.
- I will submit the film to various international film festivals via the Internet service www.reelport.com

The ultimate goal of the above activity, in addition to gaining some audience for the film, is for me to get to work in further, larger-scale film productions, be they documentary or fiction. Another objective for me is to advertise my own video production business out of which I make my living: any possible publicity from this film will help to this end. Also, the film will serve as a demonstration of my technical (and other) capability with regards to audiovisual productions.

The film

While the previous chapters have focused on production technology and other technical aspects, this chapter will discuss the film as a piece of art: why certain choices were made from the point of view of artistic expression.

Dramaturgy

As discussed previously, the story that I felt needed telling was that also men have feelings, hopes and thoughts with regards to having children. I wanted to produce a piece where audiences could relate to these feelings and truly understand how (some) men feel about this issue. The underlying, larger theme is that we are all human with our individual thoughts and feelings, and that those feelings and thoughts should be respected regardless of whether we share those feelings or not: people in general should be respected, no matter what.

Considering what I wanted to discuss, I from the outset thought about producing something that conveys *thoughts and feelings*. I knew that I wouldn't have a definite plot or storyline akin to fiction film, but that I'd be depicting things that are subjective and abstract.

However, I was well aware that in order to produce a meaningful film, I needed to structure the film so that tension would be changed during the advancement of the film. An interesting film can seldom, if ever, be constant through its duration in terms of dramaturgical tension.

As is reflected in film, theatre and also music, the blueprint for successful dramaturgy tends to be such that the highest point in terms of dramaturgical tension occurs somewhere around three quarters into the piece, followed by a descent into resolution. The exact structure and elements of this "dramatic curve" vary from one model to another. For example the Ola Olsson model consists of six steps (Pirilä & Kivi, 2010), Rabiger (2009), however, divides what he calls "the dramatic curve" into the following five phases:

1. Exposition
2. Inciting moment
3. Rising action/Complication

4. Climax
5. Falling action/Resolution

The same pattern can be observed outside drama, as well. Two very different examples of such form can be found in music, for example:

1. The Sonata Allegro form: a structure used in classical music compositions, where (through repetition and modulation) phases of increasing intensity, climax and decreasing intensity can be observed, in this order.
2. Some electronic dance music genres (particularly Trance) almost exclusively feature compositions that follow a pattern of increasing intensity, climax and decreasing intensity.

It is fair to say that this general pattern has been viewed as one that works in art applying dramaturgy, as it has been widely employed in different arts for several hundreds of years, starting from Greek drama.

A brief reflection on the film follows, with reference to “the dramatic curve”.

Exposition: introducing the characters

The film begins with introducing each character through mostly visual clues. Kalle the researcher/journalist is seen typing on his computer, Joni the janitor is seen sitting in his control booth at work, and J-P the lawyer is seen in his law offices. The actual subject is discussed, but only subtly. During this exposition phase, the viewers understand that there will be three characters of different backgrounds and personalities, and that the film has something to do with parenthood. However, not much is revealed at this point, so as to not give everything away right away, and also because I wanted to give enough room to the characters themselves, rather than dive straight into the childlessness topic.

Inciting moment: Joni

The inciting moment is the point at which something happens to truly focus the story. In this film, this happens at around 5:46, where Joni states: “Sure I would’ve been a good father”. Before this moment, the discussion related to children has been quite general and even vague. Now we understand that not having children is perhaps a problem for Joni, and most probably to some other men as well.

Rising action, climax: Joni at work, Kalle and the bookshelf

Once we’ve advanced through the previous scenes, we begin to understand that childlessness is perhaps a problem for men, and we begin to grasp how that problem may feel like. Questions arise. What is the way forward from here? Can this problem be resolved? What happens next? Or is this a permanent state of affairs?

At 6:47 we see Joni in his control booth, lost in thought, staring into a dark lobby. Next, we see researcher/journalist Kalle in front of a bookshelf. These people are stuck in time, surrounded by artifacts of their everyday life – they are not going anywhere, not forwards nor backwards. They *are*. We begin to understand that perhaps these men will never have children – that this in fact is the permanent state of affairs. The purpose of the scene is to heighten tension: we begin to more intensely understand these men and emphasize with them.

The heightening of tension is amplified here by means of sound design, and the only dolly track shot towards the subject (made in Final Cut by means of frame resizing, rather than by using an actual dolly track when shooting), a move known as a “push in” (Kenworthy, 2009). The purpose of the push in is to increase tension, by “enclosing” Kalle in his room amongst the pile of books: he doesn’t have anybody but the books, at least not at this very moment.

Kalle standing in front of the bookshelf, browsing through backs of books at 6:50 is the climax of the film.

Falling action: the letters

At 10:43, J-P begins to read a letter to his unborn child. At this moment, we understand what the title of the film refers to.

The scene evolves, with interleaved shots of each man reading their letter to their unborn child. The men’s personalities and true feelings come to fore. We can now truly appreciate each character’s feelings, to truly understand them. We begin descending from the climax, accepting the facts of life as they are: perhaps some of these men will remain childless, and perhaps this is part of life.

Resolution: Kalle and Joni

Of the three characters, J-P is the youngest and most forward-looking. We see that he will perhaps have a child one day. He is confident in talking about his unborn child, and we get the sense that he’s looking forward to meeting this child sometime in the future.

In contrast, Kalle and Joni seem to have accepted that they will never have children. They seem content in a melancholic way. They seem to have accepted that this is the way life turned out for them.

There is no “solution” but there is resolution in the sense that Kalle and Joni seem to have accepted the state of affairs, and they don’t view it as a major tragedy. However, there is a melancholic undertone to this. At 14:14 we see that there is a bottle of vodka on the table at which Kalle read his letter. Kalle is drinking, lost in thought. The film ends with Joni reading the end of his letter, after which he looks directly at the camera. This is the only point during the entire film that anybody looks at the camera. This is much intended. The point I am making is that of communicating resolution: Joni has said what he wanted to say, here it is, and life goes on.

The feeling of resolution is amplified by means of music. We hear a sad theme, which is introduced here for the first time. The theme takes us to the end of the film.

The below figure depicts the dramatic curve as applied in this film.

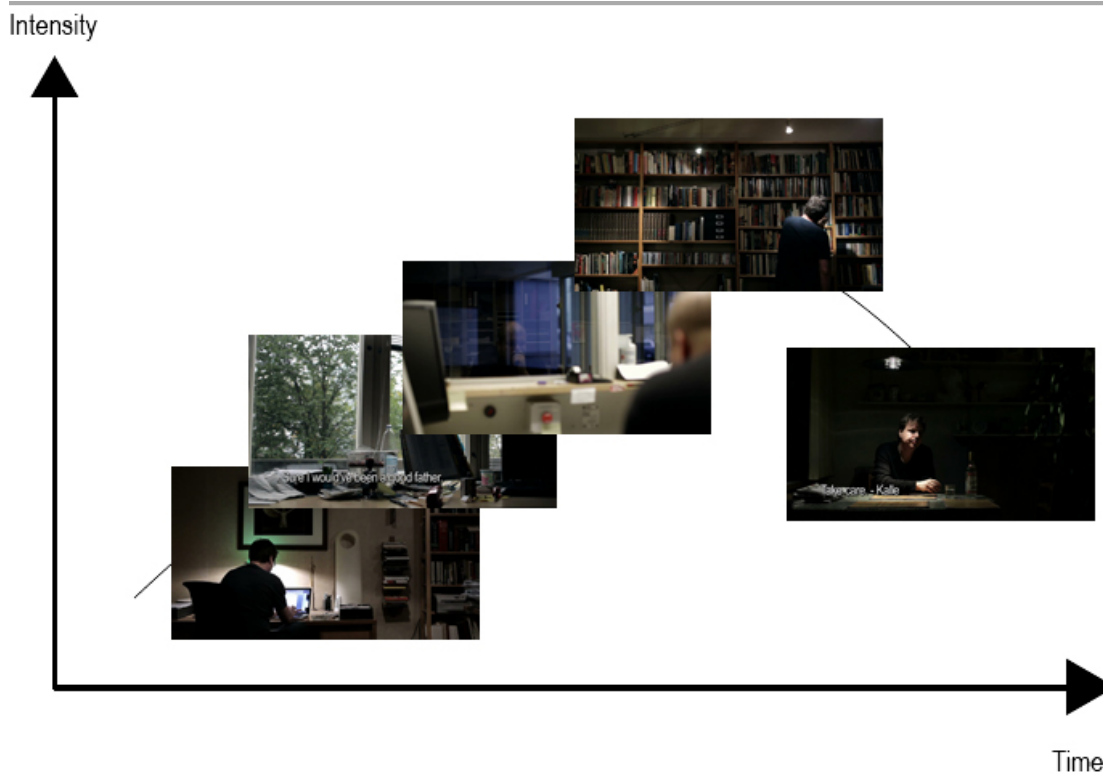


Figure 12: Shots from different scenes of different dramatic intensity, overlaid on the dramatic curve.

A point to make here is that somewhat atypically, the dramatic climax of the film occurs relatively early on into the film (less than halfway in). This is most intentional. I deliberately wanted to make a film with no definitive resolution, or a “solution” to a problem, but to depict the very nature of life itself (through the characters and their stories): sometimes, we have little control over our destinies, or sometimes we don’t even want to try and affect our destiny. “We are all stardust”, as the proverb goes.

The characters don’t necessarily view not having children as a problem nor tragedy, but a fact of life, however with a sometimes melancholic undertone. I try and communicate this sentiment with a prolonged phase of falling – or rather plateaued – dramatic intensity: the section where the three letters are read. So perhaps it is more correct to state that the climax doesn’t really happen early on, but that the post-climax phase is prolonged in the film, in order to communicate the nature of life with no definitive rights or wrongs.

Cinematography

As discussed in previous sections, choices regarding cinematography were driven firstly by needs regarding the telling of the story, and secondly to achieve a “film look”.

As far as my plan for shooting, I utilized a “triple-shot technique” (Valkola, 2004), or rough preplanning of the film from shot to shot. Due to operating as a one-man team, I wanted to achieve the highest level of efficiency possible. So I had a rough idea of how I would edit each scene, prior to shooting. Then shooting became a matter of shooting the necessary shots.

I wanted to shoot the characters in two locations: their homes and places of work. This was because I wanted to give information on the characters via indirect clues. The characters were not the point of the film, but what they collectively had to say was. However, I felt giving out some information on the characters was necessary,

in order not to reduce them to a bunch of talking heads. People's occupations tell something about them, and it is easier to relate to people one knows at least something about.

Because of this, as well as project constraints, I knew I wouldn't be building sets very much, but that I'd be shooting in whatever spaces and locations were available, and in available light mostly. However, I had the specific visual "film look" aesthetic in mind. Parts of building a "look" happen during post-production. However, the source footage needs to be such that it accommodates the building of the desired look well.

Lighting

So, I knew that in order to achieve the film look I was trying to achieve, I needed to be able to shoot some shots in locations where a point light would be available. By placing characters in relation to the point light, I could partially light them. Also, by careful camera positioning I could also achieve rim light¹³ and other creative effects.



Figure 13: Kalle in rim light. The main light source is an available lamp on the wall behind him in the shot.

Practically all lighting of shots was done in available light, through careful placement of the characters and the camera, in relation to available light sources. An exception is a scene with Joni, discussed previously (Lighting).

The dramaturgical development in the film is supported by the discussion moving from the general (character's backgrounds, parenthood in general) into the more personal and intimate (letters to unborn children) in the end. I wanted to support and amplify this development by means of visual aesthetics. This shows as the first half of the film being relatively well-lit, while the latter half consists of many shots where light sources are scarce, and shots remain dark and contrasty. I aimed at showing the person, rather than his surroundings, towards the end, so as to support the dramatic development into the more intimate.

¹³ A.k.a "back light": lighting an object from behind so that a bright line around the edge of the object is created, for aesthetic effect and to help visually separate the object from the background.



Figure 14: A shot that represents the first half of the film well in terms of lighting: an evenly lit scene.



Figure 15: A shot that represents the latter half of the film well in terms of lighting: a point light lighting a character from above.

Shot composition and symbolism

A general principle that I tried to follow when composing shots was that I wanted to give viewers enough information and variety. Hence the typical range of shot sizes from long shots to extreme close-ups.

Another principle included the supporting of dramatic intensity. Generally speaking, as dramatic intensity is heightened, the smaller the shot in the film. The only extreme close-ups are of Kalle: towards the end of the film, where he finally acknowledges that he will probably never have children (at 8:59), the first one is seen.

Rather than shot sizes, a more interesting topic for discussion as far as cinematography in this film is the use of symbolism. In quite a few instances, I use shot composition and other visual symbols to communicate something that would otherwise be less discussed.

The most evident use of symbolism is the sections where empty children's parks are seen. The parks are, and remain empty: they are not filled with children that the characters had. Perhaps they will forever remain empty?

The second-most evident use of symbolism is the use of objects as symbols, namely:

- Stone wall (3:22): a "wall" separates the characters from children
- An hourglass on Juha-Pekka's law offices' window sill (5:16): time is passing by, is it running out on him?
- Worn-out soccer ball (10:05): will there ever be anyone (child) to kick it in motion again?
- Painting of a child on the wall of Juha-Pekka's apartment, with focus moving from a plant to the eyes of the child (10:39): the unborn child is "waiting" for Juha-Pekka to help bring him into the world

Besides using actual objects, I use shot composition, specifically character placement in frames, as a symbol. This is most evident in shots where the character is intentionally placed "the wrong way".

A commonly used compositional technique is the *rule of thirds*, where eye lines are kept on the top third of the image and the subject in either the right or left third (Lancaster, 2011). This is actually a simplified application of the *golden mean*, a ratio prevalent in nature and studied by mathematician and philosopher Pythagoras in ancient Greece. It is commonplace for cinematographers to compose shots following the rule of thirds. In conjunction with placing subjects according the rule of thirds, it is commonplace to place a character on the right or left third so that they're looking into the frame, rather than towards the closest edge.

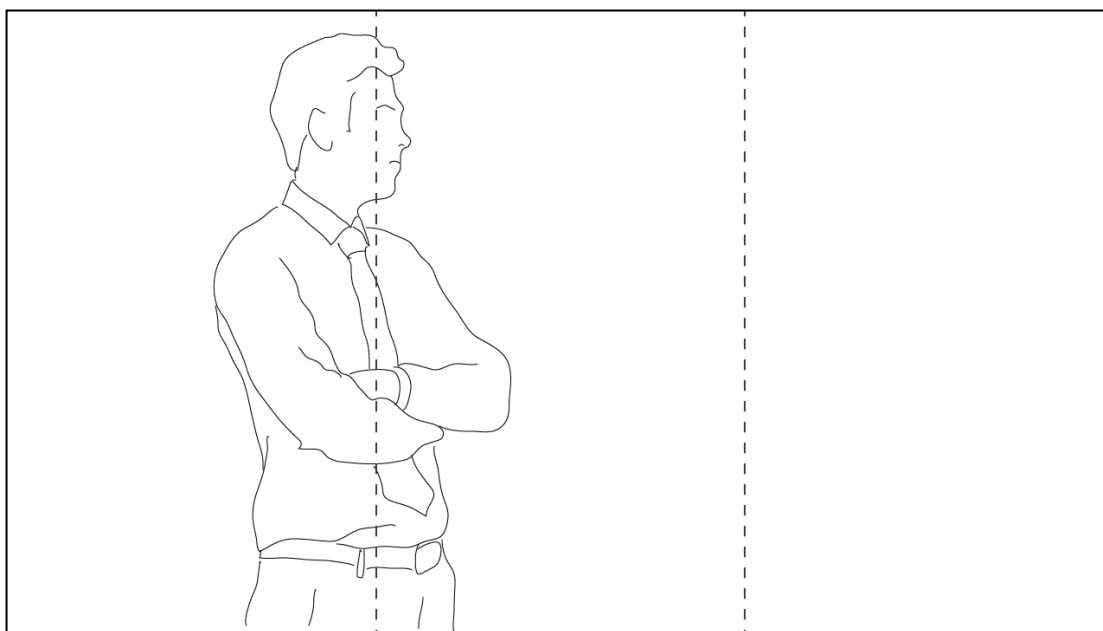


Figure 16: A typical placement of a character in the frame, considering the rule of thirds and look direction.

In some shots, I've placed characters "the wrong way", considering the rule of thirds and the direction they're looking.



Figure 17: Juha-Pekka in a frame, looking towards the edge of the frame, contrary to typical use of the rule of thirds.



Figure 18: Joni in a frame, looking towards the edge of the frame, contrary to typical use of the rule of thirds.

The reason for an atypical composition (see Figure 17, Figure 18) is symbolism. The characters are not looking into the frame, or at anything we can see. Where are they looking at? They are looking into the future. Here, I try to communicate a sense of anticipation, hope and longing. Hence the unconventional composition.

Music and sound design

Considering the topic and the way I chose to treat it (letting the story unfold through the stories that the men themselves tell us), I knew that the role of music and sound design would be subtle and supportive. I could easily ruin the atmosphere and building of dramatic tension with overly pathetic, dramatic or sad music and sound design. The approach that I took as far as music was semi-analytical.

The first thing that I did when starting to compose was – quite unconventionally – was that I chose the key/mode in which I would compose the main theme. My choice was a-dorian.

The reason for choosing such an unconventional way to compose music originated from the fact that I was composing for my own film. Firstly, this was going to be film music. Film music is, by definition, music whose role is to support moving images and dramaturgy. In the case of this project, I knew what the dramaturgy and overall aesthetic would be like; hence, I knew exactly what type of music would support the telling of this story the best.

As discussed previously, a strong implicit theme in the film is that there seldom are definitive rights or wrongs in life, but that we “are all stardust”, living through whatever our destinies throw at us. As such, the general feeling of the film is not “happy” nor is it “sad”. Neither is it “hopeful”, “hopeless”, or any other well-defined feeling.

To this end, I knew modal music would suit well. Modal scales differ from Western minor-major –tonality (with the exception of the Ionian and Aeolian scales, that correspond to major and natural minor keys). As modal music is never “in major” or “in minor”, it seldom strongly communicates feelings such as “happiness” or “sadness” to Western listeners.

In my view, the most neutral modal scale is the dorian scale. It is close to a natural minor scale, however it features a sharp sixth, giving it character that separates it from the plain and “sad” natural minor scale. Also, perhaps due to my ear having been exposed to much Western music, I find that the key of “a” is one of the most neutral keys. For these reasons, the main theme in the score is composed in a-dorian.



Figure 19: Score, main theme.

Besides the modal main theme, another piece of music is featured. This is a simple eight-bar pattern, in a natural minor key. Even though the atmosphere of the film is not “sad”, as discussed above, I chose to present some rather melancholic music in the end of the film. Of the three characters, Joni appears somewhat saddened by the fact that he and his wife have not been able to have children (in contrast, Kalle seems content, and Juha-Pekka hopeful). Joni’s feelings seem most defined of the three characters. The somewhat sad music depicts his feelings, so the sad natural minor theme suits here. Joni’s letter is the most emotionally engaging, and I wanted to end the film with leaving the audience feeling something quite strong. Hence the dramaturgical choices and the choice of music at the end of the film.

Sound design, as far as adding synthesized sounds, was done with Native Instruments Absynth 5 granular synthesizer. I chose granular synthesis, because I find this technique best produces the type of sonic aesthetic

that communicates hard-to-define feelings such as “sense of isolation”. Again, I was deliberately trying to steer away from dramatic and pathetic expression.

Synthesized sound design can be heard at 3:21 onwards, and 6:40 onwards. These are a scene with the stone fence beside an empty children’s park, and Joni lost in thought and Kalle amongst his collection of books, respectively. The dramaturgy in these parts of the film deals with feelings of emptiness and longing, with a melancholic undertone. I find the sonic aesthetic communicated by the type of granular synthesis that I used suits here well – it amplifies the feeling I’m trying to communicate.

Other sound design, besides using synthesized sounds, was the including of recorded foley effects into certain scenes. I found that certain locations, in particular Joni’s apartment (11:25 onwards) and Kalle’s parents’ apartment (12:19 onwards) were too silent. I recorded room ambience for post-production use in these locations. However, I discovered later on that I had recorded little more than self-generated hum from the audio recorder. I decided to record foley effects in my studio and add these to convenient places in the film. The most notable use of foley is:

- Sound of a Xerox machine at 2:57 in Joni’s place of work (audio recorded in my studio)
- Sound of a car passing by on an outside street near Joni’s apartment at 11:28 (audio recorded at my studio)
- Sound of plumbing in Kalle’s parents apartment at 12:22 (audio recorded in my studio)
- Sound of traffic outside Juha-Pekka’s apartment at 11:10 (audio obtained from a sample library)

In the mix, I used Universal Audio analogue emulation plug-ins. This choice is consistent with the desired overall aesthetic of the film. In a way, in my efforts to generate a film look, I was essentially generating a vintage look: film has long ago been replaced by digital media as far as the most popular choice for cinema production. In keeping with this, I wanted to produce a traditional-sounding soundtrack, rather than a very modern one. Here, analogue compressor and equalization plug-ins were suitable tools.

As far as mastering, I was mostly concerned with the level. I wanted to ensure that my mix was reasonably close to 0 dbFS, as it would be easier to produce quieter versions of the master than afterwards make copies louder than the master (when maximizing a quiet master, also noise is maximized; hence, producing a loud master with a subsequently high signal-to-noise –ratio is a rational choice). Probably the most used distribution channel for the film will be the Internet: as the film is played on personal computers where the audience can easily adjust volume, I am not concerned that the master is too loud.

In order to achieve maximum levels (peak and RMS) close to 0 dbFS¹⁴, I first applied a set of effects (e.g. loudness maximization) from within the iZotope Ozone 4 mastering suite on the master out of the soundtrack Logic Pro session. I bounced the soundtrack and imported into Apple Soundtrack Pro. There, I manually further compressed some of the very loudest peaks. I then maximized the track again. The end result is a natural-sounding, but compressed and maximized soundtrack.

Reflections and conclusions

Prior to embarking in my studies to obtain this Master’s degree, I had studied plenty. I’ve written numerous articles and completed several different types of projects. This project stands out of all the rest, with many respects. Firstly, I’ve never learned as much from doing a single project before. Secondly, the completion of

¹⁴ Decibels, digital full scale. Zero decibels digital full indicates 100% level, in other words as loud as is possible.

this project is a homecoming for me: I spent way too many years doing work that I did not enjoy at all. Regardless of whether doing projects like this will ever help me make a living, I will continue to do similar projects, paid or not. At heart, I am an artist; I have a strong need to express myself by producing productions similar to this project.

As far as specific learnings, elaboration follows.

Operating alone without any help, work that was necessary yet not directly related to actual production or post-production took a surprising amount of time. Particularly, *recruiting* the characters in this film was particularly difficult. I knew that the topic is a sensitive one and that not everybody would be willing to share their thoughts on it. However, it was a surprise that even after having exhausted all the possible channels for recruitment that I could think of, little had happened after the first few months into the recruitment phase. In future productions, I will carefully consider the topic and the various practical obstacles that may arise because of it. Clearly, the choice of topic and approach are very key in documentary filmmaking. It can be assumed that a lot of interesting stories remain untold because telling them would be prohibitively difficult in practice.

Based on my rather extensive experience of producing cinema as a one-man crew, I can say with confidence that *two is probably the reasonable minimum number of personnel that a film crew should have*. It is possible to shoot film/video and record audio alone; it is possible to light sets alone; it is possible to direct characters alone. However, doing all of that, and also hauling and moving hardware from one place to another is a very serious endeavor. Many times after the day's shoot I was physically very tired. I am sure that this exhaustion partly affected the outcome of the production. Probably I would have shot some in my opinion mediocre shots again, had I had any strength left at the end of the day.

As far as audio post-production, I would say that the two most important factors when deciding what software to use are *compatibility* with other post-production software, and *suitability* for post-production tasks. I chose to reject Steinberg Cubase almost solely because of the reason that it doesn't import Apple XML files (from Final Cut). However, I later on during the process discovered that both Final Cut and Cubase support OMF, an older interchange format. Should I have known that earlier, I would have done all audio post-production work with Cubase. The reason is audio editing features vastly superior to those of Logic Pro. Editing individual audio clips in Logic is very cumbersome: as an example, Logic doesn't feature a level handle for individual clips, but clip-specific level edits need to be done by means of operating a specific drop-down –menu mechanism in its own window, or by means of track level automation. Both methods are far inferior in terms of usability to just dragging a level handle up or down, like in Cubase (or similarly in Pro Tools). Because of this reason, dialogue volume level from one sentence to another is not as consistent as I'd like in this film.

Editing software, likewise, needs to be able to talk to other post-production software. Again, in addition to usability, compatibility is the most important factor, particularly the possibility to export audio in formats that audio post-production suites understand. Probably not an issue in the case of most editing software (e.g. Apple Final Cut Pro, Avid Media Composer, Adobe Premiere), it should be noted that there are recent, undesired developments in this area. When launched, Apple's latest version of Final Cut – "Final Cut X" – didn't include XML support. This factor alone would have rendered Final Cut X useless in this project.

As far as hardware, particularly camera equipment, I can say that evangelists preaching the superior value of DSLR video cameras are right. I've received spontaneous praise regarding image quality and aesthetics in this film from experts and non-experts alike. I think it is fair to say that my film has a "film look", at least to an extent. Non-experts that I've talked to can't find any meaningful difference in this film's visual aesthetics

compared to some commercial productions. Granted, this film doesn't look like it was made in Hollywood (or even Arabia), but it doesn't look like it was made with practically no budget, which was the case.

How the film will be distributed remains to be seen, and whether experts will agree that a quality level that can be described as "professional" has been reached or not. Nevertheless, various people of different backgrounds and proficiencies with regards to cinema have seen this film; based on their feedback, I'm confident to conclude that yes, it is possible to produce professional-quality cinema with mid-range technology.

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APPENDIX: Film availability

The film “Three letters to a child” that forms the production part of this thesis is attached on a data DVD-disc with the physical copy of this paper. Note: the disc is data DVD, and on the disc you will find a H.264-compressed Quicktime file of the film – the disc is not playable in DVD players.

The film is also available for viewing on the Internet, password “3kl”, via this link: <http://vimeo.com/35769574>. Fullscreen viewing is recommended: please press the four-arrow –icon on the bottom left of the player window to enable fullscreen. During spring 2012 password protection will be removed, so it might be that at the time of viewing no password is required.