Repositório ISCTE-IUL

Animation and Adults

Between the virtual and social reality

Mónica Cruz
Instituto Universitário de Lisboa
(ISCTE-IUL)
Lisboa, Portugal
monicaantunescruz@gmail.com

Abílio Oliveira
Instituto Universitário de Lisboa
(ISCTE-IUL), ISTAR-IUL,
Lisboa, Portugal
abilio.oliveira@iscte.pt

Joaquim Esmerado
Instituto Universitário de Lisboa
(ISCTE-IUL), ISTAR-IUL,
Lisboa, Portugal
joaquim.esmerado@iscte.pt

Abstract — **In our modern societies, the reality that we live is continuously transformed by technology, different ways of communication and multiple information, creating a (new) virtual reality. How is our social world linked to the virtual world? Animated films may help us to discover and understand this interface, in which their boundaries may not be clear. What we call human reality approaches fantasy realms in the virtual worlds. The aim of this study is to explore what animated films transmit to an adult population - what they feel and what they value in animated films, trying to understand the importance of animated films in adults' lives. It is also intended to explore which technologies are most used to consult information about animated films, and which are the most important reasons for choosing an animated film, instead of other styles of movies. Our study consists in the development of two focus groups, with adult participants, between 25 and 35 years. This study is part of a master's thesis that is under development. Through the focus group we aim to obtain data and gather knowledge about our research topic. The results will help us to verify the most relevant factors and indicating the items to include in a questionnaire that will be used in a next study.**

Keywords – animation; technology; adults; virtual reality; social reality.

I. INTRODUCTION

The birth of cinema came to change the world as it is widely recognized. Edward Ross says that movies have revolutionized the way we look at the world, destroying the barriers of time and space, to bring new possibilities to vision [1]. Francesco Casetti adds that a film makes our vision free, restoring it with invigorating potential.

Dziga Vertov goes further and states that human beings cannot perfect their eyes, but they could indefinitely perfect the camera and, in this way, they could turn the invisible into visible, and the uncertain in sure [1].

Thus, the camera becomes an important object, because it has the power to transform our view of the world. It is impossible not to mention that even the camera only shows what it can be shown, these being the consequences between necessity and romanticism. The person who makes a film is the one who chooses what to show and what to hide, as well as decides the angles and perspectives from which we observe a film. These choices will influence our perception of the world.

In this way, the power of animated films will continue to increase the potentiality of human vision and teach us to look at the world as never before was possible (Ross, 2015).

Ross also refers Bukatmann who said that today's technologies help to transform the human vision and redefine cinema narratives as something to dwell on (as an active view), instead of just observing.

Nowadays, animated films (in cinemas, internet and television) have a success that in the past was not possible, including in the glory days of the Disney studios. These were limited, for a long time, to an infantile public, nevertheless they gained many trumps with the adults through the commercial cartoon [2].

Lee & Margaret (1994), in their study, reported that the role of animation has been altered over the past decades, and that it has gained a great presence with the adult audience, in the case of sale of products. Bush, Hair & Bush (1983), besides describing this type of use of animation, also point out that animation can be understood as a creative strategy for creative people.

So, it is clear to understand the impact that animated films have on humans' vision and points of view, as well as the evolution of animation on adults lives. Animation is linked to fantasy and imagination. Who doubts about the importance of imagination in human creativity, development and wellbeing? This also help us to understand what determines the preference for animated films on adults, whatever their perceptions about this style of films.

However not only movies have passed through huge transformations through the years, technology has also evolved in an incredible way, so the information became easily accessible to almost anyone, and even something massive, that involves our lives in the most diverse ways and contexts.

The term Social Media refers to internet sites and services that promote interaction among participants. Some examples may be discussion forums, blogs, wikis, podcasting, social networking sites, among others.

Social Media has to be distinguished from Mass Media forms, as this is a one-to-all mechanism in broadcasting.

In contrast, the social media audience shares via the network the participants content that can be published by any individual, but continues to be distributed through large-scale audiences.

Fuchs (2014) notes that the terms "social media" and "web 2.0" began to be popular in describing types of applications on the World Wide Web. The term "web 2.0" was recorded by Tim O'Rilley, in 2005, with these main characteristics: radical decentralization, radical trust, participation rather than publication, users as contributors, richer user experience, web usage as platform, collective intelligence, better software for more users.

Lopes (2009) summarizes that Social Media is a facilitator of conversation, having as main intervening the user, leaving the user to assume a passive role for active becoming decisive in the determination and construction of the Web.

Manuel Castells is one of the most cited authors in the social sciences and studies on media and communication. He enhanced the importance of Internet and Social Media in terms of network society. Castells worked on concepts such as communication and mass self-communication, and he refers that the emergence of this type of communication is due to the result of profound changes in the power of the structures of society.

Castells (2009) describes Social Media as a form of mass self-communication, and a social realm where the power of communication and counter power is exercised.

In the present work, social media is important because it will help us to understand the communication that is present in today's technologies as well as the importance it has for users. In this way, we will be able to understand the flow of the use of technologies and the type of information and online communication that users use in their daily lives.

Nowadays, in a great extent, communication is achieved through social networks. The possibility of a quick contact allows individuals (as social net users, or social 'networkers') to have an important 'meeting point'. In the study conducted by Lenhart, Purcell, Smith and Zickuhr, in 2010, on the American population it was observed that 72% of young American adults use social networking sites.

In the case of Portuguese population, in a study conducted by Marketest Consulting, from 2011 to 2016, 94% of Portuguese have a Facebook account, 37% use a smartphone to access social networks, 87% usually watch videos on social networking, 11% to 17% considers that following or being a fan of a company or brand in social networks influences the option (or choice) for a brand or company. The most used technological equipment to access to social networks is the smartphone and 3 millions of Portuguese access to social networking sites.

The human essence is always taken into the world of rulemaking, whether with a sense of its own or acquired through culture. Therefore, there is an interdependence in which the behavior of each of the parties involved determines, and is determined, by the behavior of the other, and there is a change in perspective.

After all, with so many facts about communication, language, and perspective, how do they affect reality? Is "Reality Real?" [3] In what form and how many forms can this exist? In sum, how is our social world linked to the virtual world?

We already pointed out some important facts as the evolution of technologies and the social media influence on this growth but, animated films may help us to discover and understand this interface, between the social and the virtual, in which boundaries may not be clear and are still not enough explored.

This work is part of a master's thesis, under development, focused on the role of technologies and online information in the preference for animated films in adulthood. In order to address this question, the empirical part of the work was divided in two parts, an exploratory part, to explore the perceptions about animated films and the role of technologies by the preference for this style of films; and an inferential study, to verify the consistency of the results found and to deepen the understanding about the adults' perceptions about this style of films, and the importance of technologies in this process, emphasizing that the study will be based on a questionnaire consisting of items or indicators that derive, largely, from the results obtained in the exploratory study - with the focus group.

Focus Group is a method of gathering data, taking into account specific topics. In order to carry out a focus group it is necessary to have prior planning and it is up to the researcher to determine the issues to be addressed, being attentive to the group. The discussion within the focus group stimulates speeches among participants that would not occur in 'real life'. According to Morgan (1998) this method is considered the most efficient to gather data; in fact, a large amount of concentrated data is achieved in a short time.

Krueger (1994) argues that the discussion in the focus group is very effective in providing information about why people think or feel the way they do, concerning a certain topic. A group in itself is not considered good or bad but merely as a reflection of human capabilities.

Morgan (1988) also reports that the great potential of the focus group is the explicit use of group interaction to produce data, enhancing feelings, opinions and thoughts, that would be less accessible without the interaction found in a group. Focus group can be used as a single research method or as a combination with other methods. They help guide a new area of research, generate hypotheses based on the opinions, thoughts and feelings of informants, evaluate different types of research or populations, and develop questionnaires.

Flick (2014) makes reference to Lunt & Linvingstone, who affirm that the focus group can be used like simulation of the discourse and the conversations of the quotidian, or like an almost naturalistic method to study the generation of the social representations or the social knowledge in general.

The great overall strength of this method is:

1) Focus Group generates discussion, and thus reveals both the meanings that people read on the topic of the discussion and how they negotiate those meanings; 2) focus group generates diversity and difference, either within or between the group, and thus reveals what Billig (1987) termed the dilemmatic nature of everyday arguments [46].

Barbour (2007) argues that the focus group number to be carried out should be evaluated according to the interests and objectives of the research.

In our research we intend to understand the ideas, opinions, thoughts and feelings of each individual, as well as to understand how the group reflects and transforms the presented concepts. Through the focus group, we also want to gather knowledge that would be difficult to reach without a group discussion condition, and to check the most relevant factors and concepts to include in subsequent studies.

II. OBJECTIVES

The main objective of this study is to identify what animated films mean, and transmit, to adults – what is their perception about animated films, and the importance of technology on their preference for this type of films.

Thus, it is also relevant to explore the sources of information consulted about animated films, what are the technologies they use to do so, the reasons that support their eventual preference for animated films (among other styles of movies), and what is the importance that animated films have in their day-to-day lives.

It is also intended to compare the influence of gender/sex in the perception of animated films.

III. METHOD

In this study we had a sample of eight participants, four women and four men, with ages between 25 and 35 years old (the average of age was 27,6). Participants were involved in a focus-group addressing several topics, such as:

- What do you feel about animated films?

- What do you value on an animated film?

- To what population are animated films addressed to?

- How do you choose an animated film instead of other kind of films?

- What's the importance of animated films on your daily life?

- What kind of technologies and online sources are used to search information about animated films?

- What is important on the choice of an animated film?

The participants were informed that their participation in this study was voluntary, confidential, and anonymous. Accordingly, we obtained a verbal consent from each participant, asking their permission to record their intervention in the group discussion.

With the information gathered from the focus-group, we summarized, categorized and analysed all the qualitative data, considering the categories as dependent variables, and the gender of participants as the main (independent) variable in our research.

IV. RESULTS

The following tables (cf. Tables 1 to 7) represent the categories or dimensions found, with the corresponding items in each case. The result obtained were compared in terms of gender (female and male). The more an item is relevant to a particular gender, the more signs + (in a maximum of 4) are linked to gender, if an item is not relevant or there's no information the sign – is used. The signs are also used on a frequency table base, on which symbol represents one participant reference.

For almost all the participants (75%), an animated film is, above all, a synonymous of a message to be transmitted (cf. Table 1).

Regarding the feeling about animated feature films 75% of the participants refer the importance of fun, as well as a message to be transmitted. 62,5% refer the importance of remembering infancy memories as feeling remembered (item Children).

Comparing the gender differences we found that male participants considered fun, message transmitted and children more important, on this dimension. Female participants refer in their opinion that they consider more important the message to be transmitted.

Our findings reveal the much of the feel about animated films.

TABLE I.   DIMENSION: WHAT DO YOU FEEL ABOUT ANIMATED FILMS?

Category/Dimension	Unit of Analysis/Item	♀	♂
What do you feel about animated feature films?	Fun	++	++++
	Message transmitted	+++	+++
	Children	++	+++
	Illusion	-	++
	Fantasy	-	++
	Play	+	+
	Joy	++	+

In Table 2 we can observe the value given to animated films, which we divided in two sub-dimensions, characteristics and emotional aspects. For 87,5% of the participants the story is the most important characteristic that they value.

Comparing the genders, women considered the comic aspect to be more relevant, and men considered the story to me the most important.

TABLE II.   DIMENSION: WHAT DO YOU FEEL ABOUT ANIMATED FILMS? SUB-DIMENSION: CHARACTERISTICS, EMOTIONAL

Sub-Dimension	Unit of Analysis/Item	☿	♂
Characteristics	Story	++	++++
	Content	++	+
	Context	++	+
	Cartoons	+	++
	Voice	-	++
Emotional aspects	Philosophy	-	+
	Emotional feelings	++	+
	Memory from the past	+	+
	Comic	+++	-

Another dimension revealed was the population which animated films are addressed to and it was cleared two sub-dimension the age and person characteristics (cf. Table 3).

Regarding age is unanimous that animated feature films are address to children and adults, which we can generalize and conclude that they are made for all ages.

Female participants focus their attention on creative persons.

TABLE III.   DIMENSION: WHAT KIND OF POPULATION ARE ANIMATED FILMS ADDRESS TO? SUB-DIMENSION: AGE, PERSONS CHARACTERISTICS

Sub-Dimension	Unit of Analysis/Item	☿	♂
Age	Children	++++	++++
	Adults	++++	++++
Person Characteristics	Creative persons	+++	++
	Imaginative persons	++	+
	Personality types	-	++

On Table IV, we observed the dimension How do choose an Animated feature film instead of other kinds of films. The results are clear on considering the trailer as the main responsible to this decision.

However among women other specific characteristics of the film are also considered important, comparing to the knowledge about the producer considered more important by male participants.

TABLE IV.   DIMENSION: HOW DO YOU CHOOSE AN ANIMATED FILM INSTEAD OF OTHER KIND OF FILMS?

Category/Dimension	Unit of Analysis/Item	☿	♂
How do you choose an animated feature film instead of other kind of films?	Trailer	++++	+++
	The child inside us	-	+
	Infancy memory	-	+
	Knowledge about the producer	+	+++
	Specific Characteristic	+++	-

On Table 5, is described the importance of animated feature films on daily life. It was almost unanimous (75%) from all participants that they bring joy to daily life.

Comparing genders we can observed that male participants also considered about the memories reminders comparing to ice breaker and the connection of people from the female opinion.

TABLE V.   DIMENSION: WHAT'S THE IMPORTANCE OF ANIMATED FILMS ON YOUR DAILY LIFE?

Category/Dimension	Unit of Analysis/Item	☿	♂
What's the importance of animated feature films on your daily life?	Joy	++	+++
	Laugh	-	++
	Funny	+	++
	Makes us remember	+	+++
	Ice breaker	++	-
	Connects people	++	++

The next dimension found was what are the technologies/online information that is used to consult animated feature films (cf. Table 6). This dimension was divided into two sub-dimension, the software and the hardware technology.

Regarding software technology 62,5% of all participants refer Apps and Facebook to be the most used. In case of hardware technology, we observed that 87,5% refer the mobile phone and the tablet and only 50% refer the computer.

Comparing genders we observed on the female participants that the online sites, Netflix, mobile phone and the computer are the most used. On male participants, we observed that the Apps, Facebook, mobile phone and tablet to be the most used.

TABLE VI.   DIMENSION: WHAT ARE THE TECHNOLOGIES/ONLINE INFO THAT YOU USE TO CONSULT ANIMATED FILMS?

Category/Dimension	Unit of Analysis/Item	☿	♂
Software Technology	Apps	++	+++
	Facebook	++	+++
	Social networks	+	++
	Online sites	+++	+
	internet	++	+
	Cinema	-	++
	You tube	+	+
	Netflix	+++	+
Hardware Technology	Mobile Phone	+++	+++
	Tablet	+++	+++
	Computer	+++	+

Table VII, refers to the dimension of what is important on the choice of Animated films.

According to the results is unanimous that feedback from others is the most important, followed by 75% by trailers and 62,5% by previous knowledge about the producer.

On gender comparison female participants considered publicity to be also important.

TABLE VII.   DIMENSION: WHAT IS IMPORTANT ON THE CHOICE OF AN ANIMATED FILM?

Category/Dimension	Unit of Analysis/Item	♀	♂
What is important on the choice of an animated feature film?	Feedback from others	++++	++++
	Trailers	++++	+++
	Teasers	-	+
	Publicity	+++	++
	marketing	++	+
	Poster	+	+
	Previous knowledge about the Producer	+++	+++

V.   CONCLUSIONS AND FUTURE WORK

Nowadays, technologies surrounds us all, at any place and everywhere, and it is through technologies that our daily life is influenced by all kinds of massive information that is continuously transmitted or shared. With this existing massive information comes a field of diverse ways of transmitting this same information that insists on delegating and increasing the power of communication [4] in the human beings lives.

In the specific case of animated films, they have also been suffering from alterations helping to revolutionize the way each human being looks at the world [1], being that also conditioned to what they want to show us, and once again this influencing our perception of reality and transform it. As Denis (2007) points out, animated films were limited in time to the children's audience, therefore the born of the need for ads with adult cartoons. When analysing the results we can observe (cf. Table III) the unanimity of the participants when they refer to animated films as being adequate for all ages.

With regard to our objectives we were able to determine the mobile phone, the tablet and the computer as the most used technologies in the consultation of animated films, as well as applications, Facebook and online sites as sources of online information consulted (cf. Table VI).

These results are in line with the study by Marketest Consulting, which states that 94% of the Portuguese population has a Facebook account that the mobile phone/smartphone is the most used technology. According to the Marketest Consulting study, about 87% watch videos on social networks, so we can soon make Facebook's association as a great video disseminator, and possibly animated films, as well as the most important social media channel for adults.

Considering gender comparison of online information sources, men use Facebook and other applications more, and women use online sites and Netflix more. In the technologies used was, in part, unanimous the use of the mobile phone and the tablet, however the computer is more used by women.

Comparing what is considered more important in the choice of animated films, we find an almost unanimity in referring the feedback from others, the trailers and the previous knowledge of the producer.

In this way, we can understand this phenomenon of the power of the transformation of adult reality through the power of information through Social Media.

Bates (1991, p. 1, stated "I opened my eyes and had been transported in time and space. I could look around and almost feel things with my gloved hand, as if I were living in a different world ...", referring to virtual reality as a powerful medium of art type. Art, this, capable of modifying and creating emotional sensations in the adult these are play, joy, memories from the past (cf. table V).

Our research on animation and technology contains relevant information about the interaction of these two at the level of adults' perceptions.

Our real and virtual worlds are increasingly indelibly linked by (social) networks of information and knowledge. Animation films function in some way as portals between fantasy and reality, the virtual and the social, portraying and conveying, much of what we think and feel, namely about the way we use the technologies, and act, using them, in the most various situations and contexts. Animated films may help us to discover and understand this untouchable interfaces.

This research allowed us to gather some guidelines and important main points for us to focus on developing future work, and continuing to understand the perceptions of adults about animated films and the importance of technologies and social media on their perceptions - particularly for the master degree thesis in development, where it will be used to understand and explore more deeply some of the results obtained.

Based in our findings, from the present study, it will be possible to develop a questionnaire, on the inferential phase, consisting of items or indicators that derive, largely, on the answers obtained from the participants in the focus group.

REFERENCES

[1]   E. Ross, *Filmish*. London: Self Made Hero, 2015.
[2]   S. Denis, *O Cinema de Animação*. São Paulo: Edições Texto&Grafia, 2007.
[3]   P. Watzlawick, *A Realidade é real?* Lisboa: Relógio d'Água, 1991.
[4]   M. Castells, *Communication Power*. London: Oxford University Press, 2009.
[5]   R. Page, D. Barton, J. W. Unger, and M. Zappavigna, *Researching Language and Social Media*. New york: Routledge, 2014.
[6]   J. Dijk, *The Network Society*. London: Sage, 1999.
[7]   G. Basalla, *The Evolution of Technology*. Cambridge: Cambridge University Press, 2010.
[8]   "Amazon.com Link." .
[9]   R. Zahed, *The Art of DreamWorks Animation*. New york: Abrams, 2014.
[10]   A. Grubler, *Tecnhology and Global Change*. Cambridge England: Cambridge University Press, 1998.
[11]   J. McClellan III and H. Dorn, *Science and Tecnology in World history: an introduction*. Baltimore: The Johns Hopkins University Press, 2006.
[12]   I. McNeil, *An Encyclopedia of History of Technology*. Routledge, 2002.
[13]   T. Taylor, *The Artificial Ape: How Technology changed the Course of Human Evolution*. New york: Timothy Taylor, 2010.
[14]   F. Thomas and O. Solston, *The Illusion of Life*. New york: Walt Disney productions, 1981.
[15]   R. Williams, *The Animator's Suvival Kit*. New york: Faber&Faber, 2010.

[16] F. S. LUZ, "Animação Digital: Reflexos dos Novos Médios nos conceitos tradicionais de animação," *Imagem E Cult. Vis.*, 2009.

[17] E. Ferreira, "Imagem digital e cinema de animação: uma abordagem crítico-comparativa do uso do 3D no cinema de animação contemporâneo," *Contemporânea*, vol. 8, no. 3, pp. 3–13, 2011.

[18] C. L. FOSSATTI, "CINEMA DE ANIMAÇÃO: Uma trajetória marcada por inovações," *VII ENCONTRO Nac. HISTÓRIA MÍDIA MÍDIA Altern. E Altern. MIDIÁTICAS*, 2009.

[19] L. A. Gomes and L. T. S. dos Santos, "O Double Coding na Animação: A Construção do Desenho Animado Contemporâneo para Adultos e Crianças," *Inovcom*, vol. 2, no. 2, p. Pág–74, 2008.

[20] A. Selby, *Animation*. London: Portfolio, 2013.

[21] A. L. Júnior, *A Arte da Animação*. Lisboa: Senac, 2005.

[22] C. Fuchs, *Social Media a critical Introduction*. London: Sage, 2014.

[23] M. Castells and G. Cardoso, *A Sociedade em Rede*. Lisboa: Imprensa Nacional - Casa da Moeda, 2005.

[24] J. Bell, *Como realizar um Projecto de Investigação*. Lisboa: Gradiva, 1997.

[25] F. Lopes, "Web 2.0 - Social media Plan," Instituto Universitário de Lisboa, Lisboa, 2009.

[26] H. Rheingold, *The Virtual Community*. Reading: Addison-Wesley Publishing Company, 1993.

[27] R. Shields, *Culture of Internet*. London: Sage, 1996.

[28] F. Biocca and M. R. Levy, *Communication in the Age of Virtual Reality*. New york: Routledge, 2010.

[29] H. Eco, *A Viagem na Irrealidade Quotidiana*. Lisboa: Difel, 1986.

[30] H. Rheingold, *Virtual Reality*. New york: Touchstone, 1992.

[31] S. Bukatman, *Terminal Identity*. Durham and London: Duke University Press, 1993.

[32] S. Woolgar, *Virtual Society*. New york: Oxford University Press, 2002.

[33] H. Joffe, "Thematic analysis," *Qual. Res. Methods Ment. Health Psychother. Guide Stud. Pract.*, vol. 1, pp. 210–223, 2012.

[34] J. Fereday and E. Muir-Cochrane, "Demonstrating rigor using thematic analysis: A hybrid approach of inductive and deductive coding and theme development," *Int. J. Qual. Methods*, vol. 5, no. 1, pp. 80–92, 2006.

[35] S. Cavalier, *The World History of Animation*. London: Aurum Press, 2011.

[36] A. Oliveira, *Ilusões na Idade das Emoções*. Lisboa: Fundação Calouste Gulbenkian, 2008.

[37] D. L. Morgan, *The Focus Group Guidebook*. London: Sage, 1998.

[38] T. L. Greenbaum, *Moderating Focus Groups*. London: Sage, 2000.

[39] M. do C. L. Sá, "Perceções da condição de saúde, da autonomia e do autocuidado entre pessoas com doença reumática," Tese de Doutoramento, Universidade Católica Portuguesa, Lisboa, 2015.

[40] V. Braun and V. Clarke, "Using thematic analysis in psychology," *Qual. Res. Psychol.*, vol. 3, no. 2, pp. 77–101, Jan. 2006.

[41] A. Gibbs, "Social Research Update 19: Focus Groups," *Social Research Update*, 1997. [Online]. Available: http://sru.soc.surrey.ac.uk/SRU19.html. [Accessed: 02-May-2016].

[42] P. L. Berger and T. Luckmann, *A Construção Social da Realidade*. Random House: Dinalivro, 2010.

[43] R. A. Krueger, *Focus Group*. London: Sage, 1994.

[44] D. L. Morgan, *Sucessful Focus Group*. London: Sage, 1993.

[45] M. Bloor, J. Frankland, M. Thomas, and K. Robson, *Focus Groups in Social Research*. London: Sage, 2002.

[46] U. Flick, *An Introduction to Qualitive Research*. London: Sage, 2014.

[47] W. R. Sherman and A. B. Craig, *Understanding Virtual Reality*. San Francisco: Morgan Kaufmann Publishers, 2003.

[48] S. Moscovici, *On Social Representations*. London: Academy Press, 1981.

[49] J. F. Hair, A. J. Bush, and R. P. Bush, "A content analysis of animation in television advertising. Journal of Advertising," *J. Advert.*, vol. 12, no. 4, pp. 20–41, 1983.

[50] M. F. Callcott and W.-N. Lee, "A Content Analysis of Animation and Animated Spokes-Characters in Television Commercials," *J. Advert.*, vol. 23, no. 4, pp. 1–12, 1994.

[51] A. Lenhart, K. Purcell, A. Smith, and K. Zickuhr, "Social Media & Mobile Internet Use among Teens and Young Adults," *Pew Res. Cent.*, pp. 1–51, 2010.

[52] Marketest Consulting, "Os Portugueses e as Redes Sociais." Grupo Marketest, 2014-2011.

[53] J. Bates, "Virtual Reality, Art, and Entertainment," *J. Teleoperators Virtual Enviroments*, p. 9, 1991.