Is a picture always worth a thousand words?

A quantitative and qualitative study on how low literate and literate South Africans comprehend modal visuals from public information documents on HIV/AIDS

Master thesis
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Tilburg University
19-12-2006
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Written within the framework of the EPIDASA project

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We **Must** We **Can** We **Will**

**STOP AIDS NOW!**

**together we can**

Stop Aids Now! 2006
Preface

Ever since I was first confronted with facts about HIV/AIDS a couple of years ago I have been really concerned with the epidemic. Almost 40 million people in the world are HIV infected and there are more than 15 million AIDS orphans. Every 10 seconds someone dies of AIDS. The numbers struck me: AIDS is a huge problem and I wanted to contribute in the battle against it. When I heard about the opportunity to do research within the framework of the EPIDASA project (a SANPAD project that focuses on improving the Effectiveness of Public Information Documents on HIV/AIDS in South-Africa) I immediately knew that was what I wanted. It was the perfect chance to use my academic knowledge for a good cause.

After one year of hard work I have now finally completed my thesis. The best three months of this year were definitely the months that I spent in South Africa. I learned a lot about the country and the people. It is a beautiful country and the people are really friendly and helpful. However, I have learned that the African way of life is different from what I was used to. You can make arrangements easily, but do not always expect to get what you hoped for. It took a lot of phone calls, e-mails and appointments with different institutions and people before I could do my first interview, but this was a wonderful experience. My first respondent was a man named Philip who was honoured that I wanted to interview him. I will never forget how he looked; he obviously wore his best clothes. This interview meant a day out for him and he even earned 20 Rand (about 3 euros) for it. He was so happy. And so was I of course.

The other interviews were arranged for more easily, thanks to the Centre for the Study of AIDS (CSA) at the University of Pretoria. I have interviewed many people at the Saulsville Clinic in Atteridgeville, Pretoria. I have met wonderful people there and even learned to say something in Setswana. Despite the effort everything took I have enjoyed every minute of it.

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1 SANPAD (South Africa-Netherlands Research Programme on Alternatives in Development) is a research programme, financed by the Netherlands Ministry of Foreign Affairs, that funds high quality, collaborative research by South African researchers in association with Dutch researchers. The projects that are financed by SANPAD all deal with social development with a special focus on poverty reduction. (source: the SANPAD website)

2 In 1999 the University of Pretoria established the Centre for the Study of AIDS (CSA) “to “mainstream” HIV/AIDS through all aspects of University’s core business activities”. For the past seven years, the CSA has been developing and expanding training, educational, counseling and research programmes and is continuing to do so. These programmes are not only for people attached to the University, but are also community-based. A lot of research is done in the field with help from volunteers that live in the research areas (source: the CSA website)
After those three months of hard work and holidays it was time to go home and complete my thesis. It took me a little longer than expected, but I think the result is worth it.

Of course I could not have written this thesis without the help of many people. The first person that I would like to thank is Hanneke Hoogwegt, since she drew my attention to the possibility to do research for the EPIDASA project. But that is not all. She has supported me throughout the entire project in many ways and has been great company in South Africa. Hanneke, thanks for everything. I don’t think I would have come so far without your help.

I am also very grateful to my two supervisors, Fons Maes and Adelia Carstens. Both are very dedicated to the EPIDASA project and their interest in and involvement with my research has always been very inspiring. Thank you both for sharing your interesting ideas with me, for your useful tips and comments, for all the time you put into this project and always taking the time to answer my questions. I have learned a lot from you, thank you. Also thanks to Marije van Amelsvoort for being a member of the exam committee.

There are many people in South Africa who have helped me. A few deserve an explicit mentioning: Sydney and Sthe from the Centre for the Study of AIDS and my interpreters Kerapetse and Tebogo. Without your help I would not have been able to conduct so many interviews. Also many thanks for showing me the real South Africa.

Finally, there are many friends and family members who I would like to thank. It was often difficult to comprehend for them what I was doing and why it took so much time, but they supported me in many ways. Mum, dad and Heleen, thanks for your support, for your belief in me and for listening to me (I know it was not always interesting). Thank you for everything, I really appreciate it.

Karen Foesenek,
December 2006
Abstract

This report describes a research project aimed at investigating what the effect of visual abstraction in modal HIV/AIDS visuals is on the comprehension of the intended message by low literate and literate South Africans. The research material consists of twelve visuals, which all contain at least one form of visual abstraction. Six degrees of visual abstraction were tested, namely humans, meaningful bodily elements, analogical objects, conventional symbols, metaphors and metonymy. Forty interviews with low literate South Africans were conducted and thirteen questionnaires were completed by literate South Africans. All respondents were presented with the twelve visuals in order to find out how they recognise and comprehend the six degrees of visual abstraction and if they are able to comprehend the intended meaning of these instructional visuals. The results show that visual abstraction has a negative effect on the comprehension of the intended meaning of modal HIV/AIDS visuals. This effect is stronger for low literates than for well educated participants. In general the concrete visual elements were well recognised by both literacy groups, whereas abstract elements were especially problematic for low literates. The visuals that contain different kinds of abstract representation were worst comprehended by all respondents. The results indicate that designers of health documents should avoid abstract representation and use concrete elements such as humans and familiar objects to convey a message instead.
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1. Introduction

1.1 South Africa and HIV/AIDS

Southern Africa is and remains the epicentre of the global AIDS epidemic. According to the UNAIDS/WHO\(^3\) Epidemic Update from December 2006 approximately 39.5 million people in the world are now living with HIV. 4.3 million people were newly infected with the virus in 2006 and 2.9 million have died of AIDS in this year. Two thirds of all HIV infected people in the world live in Sub Saharan Africa: approximately 25 million. Of all African countries, South Africa is the one with the most HIV infected people: 5.5 million, which is more than 20\% of the total population and the epidemic is still growing in this country. Only recently the South African government is undertaking action in the battle against HIV/AIDS.

HIV is the virus that causes AIDS. HIV stands for Human Immuno-deficiency Virus; it is a virus that infects certain cells of the immune system and systematically thins out the body’s defences. In this way the immune system is being damaged. Eventually the virus is able to destroy the immune cells more quickly than they can be replaced, as a result of which an HIV infected person is extremely susceptible to opportunistic infections, such as tuberculosis or pneumonia. When he or she has gotten sick because of the virus, this person is said to have AIDS, which stands for Acquired Immune Deficiency Syndrome. A person in the developing world, who does not receive any medication, is usually expected to live for six to eight years from first being infected to developing full-blown AIDS.\(^4\)

In 1981 the first cases of AIDS were discovered in hospitals in the United States of America, the Democratic Republic of the Congo and on the shores of Lake Victoria in East Africa (UNAIDS, 2006). According to Avert, an international HIV and AIDS charity based organization in the UK, in 1984 scientists discovered the HIV Virus and were able to isolate it\(^5\). Scientists have been trying to find a vaccine ever since. Despite the efforts a cure has not been found yet. However, there is treatment available for people living with AIDS. Antiretroviral

\(^3\) UNAIDS is the Joint United Nations Programme on HIV/AIDS; WHO is the World Health Organization

\(^4\) Source: the CSA website

\(^5\) Source: the Avert website
therapy (HAART) can prolong and improve the quality of the lives of people living with AIDS dramatically. Unfortunately this therapy is often not available or too expensive for people in developing countries.

From the beginning it was clear that not only research should be done to find medicines, but that the spread of the virus needs more attention too. In many countries, including South Africa, HIV/AIDS is still a taboo. People do not talk about it, thus do not learn about it and cause the disease to spread more and more. Also, there are a lot of myths about ways to get rid of the virus. Stories are known of men raping babies or young girls because they think they will pass on their illness or will be cured when they have sex with a virgin.

1.2 The importance of information on HIV/AIDS

Since HIV/AIDS cannot be treated yet, it is very important that infection is averted. It is not difficult for people to prevent themselves from getting infected with HIV. Simple actions, such as having protected sex, avoiding blood contact and always using sterilized needles, razors or other sharp objects can reduce the chance of getting infected enormously. And if one is already infected, knowing this and acting accordingly can not only reduce the risk of infecting another person, it can also improve and prolong the life of the HIV positive person. They only need to know about it and be convinced of the positive effects. That is why it is so important that people, especially in countries such as South Africa, are well informed about HIV/AIDS, prevention methods and how to live with it. Moreover, well informed people can decrease the taboo on the subject, will make better use of medical care and are better able to take care of ill friends and family members. They can thus help in the battle against the expanding of the epidemic.

The past years a lot of attention is paid to informing South Africans on HIV/AIDS, mainly by independent institutions, such as Soul City6, or research projects, such as the Centre for the Study of AIDS and EPIDASA. However, the number of people getting infected and dying of AIDS every year still has not decreased. This might partially be due to the South African

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6 Soul City is one of the institutions in South Africa that provide public information on HIV/AIDS. Soul City does this not only through brochures etc.; it also makes use of edutainment, which can be defined as: 'the art of integrating social issues into popular and high-quality entertainment formats, based on a thorough research process'. Soul City for example provides information on HIV/AIDS through television programmes.
government and the lack of an effective national programme, but it also supports the claim that information on HIV/AIDS in South Africa can still be improved.

1.3 The need for non-written information

According to Kerka (2000) ‘numerous studies show that population groups with the poorest health status are also those that have the highest poverty rates and the least education’. Families with a good income usually have adequate access to medical care, work in healthy and safe conditions and can afford schooling and proper housing in safer environments. They are also able to spend money on entertainment and recreation, which can increase their joy of life and their health accordingly. Clearly, there is a vicious circle: someone who lives in poverty often cannot receive adequate formal schooling. Because of that, his or her literacy level is not good enough to understand basic health information documents. Moreover, this person is likely to have a job that does not provide a good income and therefore is not able to pay for good health care. And these circumstances will only decrease when he or she gets sick.

It is very likely that the low literacy skills of the South African population are an important reason for the high percentage of South Africans being infected with the HIV virus. According to Carstens (2004a, 2004b) thirty percent of the South Africans is functionally illiterate, which means they have a reading level below fifth grade, and another forty percent only has marginal reading skills (ninth grade level, which means they have completed primary school). A lot of instructions on HIV/AIDS are presented in brochures or other forms of textual communication. Carstens and Snyman (2003) have found that most of those information materials have a readability level of just below 60 (grade 9), but according to Doak, Doak & Root (1996) adults typically read three to five grade levels lower than the years of schooling they have completed. This means that about seventy percent of the South African population is not able to understand the written information in HIV/AIDS instruction materials well.

1.4 The positive effect of visuals in information documents

It is often thought that if low literates cannot comprehend health documents, then the only way to teach them health information is through personal communication. Although that is indeed a
very effective method, it is also very expensive and time consuming and therefore not ideal. But it is not the only solution. If low literates do not comprehend brochures, it does not automatically mean that they cannot learn something on their own. In fact they can, if only it is appropriately taught and does not require the ability to read. Possible options for teaching can be found in audio or video. Another option is to improve the existing health documents, by reducing the text and focusing on the visuals. Using visuals in information documents is not only important because the low literate audience cannot read words. Visuals can facilitate the comprehension of information in a number of ways. According to Carstens and Snyman (2003) comprehension consists of four factors: paying attention, understanding the message, remembering the message and being motivated to change behaviour. They all four improve when visuals are involved and they all four are important when it comes to health information on HIV/AIDS.

- Pictures attract attention. Whether it is their colour, shape, size or content, people’s eyes are always drawn to images. Moreover, images can increase interest and motivation during reading (Maes and Schilperoord, 2002:158);
- Images help to build a mental modal while reading a text; information from the text and from the visual integrates, making it easier to decode and understand the information (Glenberg & Langston, 1992; Doak et. al, 1996, Maes and Schilperoord, (2002);
- Information that is processed using a mental modal is likely to be better remembered. The brain has more access routes and greater storage capacity for pictorial images than for words (Doak et. al, 1996: 92);
- According to Doak et. al (1996) visual presentations have been shown to be 43 percent more persuasive than unaided presentations. They also contribute to forming opinions and behaviour changes (Maes and Schilperoord, 2002). Existing arguments can be supported or taken down and they often arouse emotions.

It is clear that illustrations are important for the comprehension of information disseminated in public information documents such as health brochures. For low literates visuals are even critical for conveying the message (Doak et. al, 1996: 446). That is, if the visuals themselves are comprehended.
1.5 Aim and overview of this research

In order to improve information documents on HIV/AIDS using visuals it is important to know how humans comprehend visuals and if they are able to learn from them. After all, these visuals aim at changing peoples’ behaviour. They want to convey an instructional message or modality, such as an advice, discouragement or even prohibition. In this report I will use the term modal visuals to describe these instructional visuals. Visuals that want to convey modalities have to make use of visual abstraction, e.g. using symbols or visual rhetoric. After all, modalities are abstract concepts and they can thus not be represented using concrete signs. However, abstract elements might cause interpretation problems, especially among low literate viewers. Through this research project I want to gain specific insight in how various degrees of visual abstraction are understood by low literate and literate South Africans and whether they are able to make the right inferences from the visuals to arrive at the intended message. Consequently, the research question of this thesis is:

What is the effect of visual abstraction in modal HIV/AIDS visuals on comprehension of the intended message by low literate and literate South Africans?

Chapter 2 will provide a theoretical background to this question, followed by an overview of the research method in chapter 3. The materials, respondents, design, instrumentation, procedure and data analysis will be discussed in that order. The results of this study are reported in chapter 4, followed by a discussion of the findings and recommendations, both for further research and for designers of information documents on HIV/AIDS, in chapter 5.
2. Theoretical framework

The first paragraph in this theoretical framework outlines the link between low literate people and their ability to ‘read’ visuals. After that, paragraph 2.2 discusses previous research on low literacy and abstract HIV/AIDS visuals. Paragraph 2.3 sums up six kinds of concrete and abstract representation and expectations regarding the way they are comprehended by low literate and literate audiences, followed by a paragraph on expectations regarding the comprehension of modality and the intended message of a visual in section 2.4. Paragraph 2.5 deals with the importance and the effect of providing context to research participants. This theoretical framework will consequently lead to the research hypotheses, which are described in paragraph 2.6.

2.1 Low literacy and visual literacy

2.1.1 Definition of low literacy

According to Carstens (2004b) low literates are people who have received a maximum of eight years of formal schooling. This limit is based on the fact that South Africans can formally leave school after having passed Grade 9 and because people who have received schooling for less than nine years are characterized as having only ‘marginal reading skills’ by Project Literacy (Carstens, 2004b: 11).

Tests exist to determine literacy skills (see Chapter 3 in Doak et. al, 1996, for a review). Although the results are always an indication - they depend on the material used and they can vary across people - literacy tests might be useful as estimates to determine which information materials are suitable for specific target groups. In this research however, as in previous research by Carstens (2004b), literacy levels are based on received years of formal education. People who have hardly or never been to school and have never learned to read or write could be defined as illiterates. Yet to be consistent throughout this report the term low literacy will include illiteracy.
2.1.2 Differences between skilled and poor readers

As is stated earlier in this report, numerous adults in South Africa cannot fully understand basic information documents on HIV/AIDS. They might know how to read most of the words, but still obtain little or no meaning from the text (Doak et. al, 1996: 4); not even if it concerns material with a fairly low readability level. Comprehending information involves more than just reading and that is why instructional texts are often misinterpreted by low literate readers. Doak et. al (1996:4) outline this using Table 2.1.

Table 2.1 The differences between skilled and poor readers

<table>
<thead>
<tr>
<th>Skilled readers</th>
<th>Poor readers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interpret meaning</td>
<td>Take words literally</td>
</tr>
<tr>
<td>Read with fluency</td>
<td>Read slowly, miss meaning</td>
</tr>
<tr>
<td>Get help for uncommon word</td>
<td>Skip over the word</td>
</tr>
<tr>
<td>Grasp the context</td>
<td>Miss the context</td>
</tr>
<tr>
<td>Persistent reader</td>
<td>Tire quickly</td>
</tr>
</tbody>
</table>

Poor readers might interpret words or sentences literally when they are meant figuratively, and thus miss the correct meaning. Because they read slowly, by the time they have finished a text they often have forgotten what they have read before. Unfamiliar words are skipped, without trying to interpret it using the context. Moreover, poor readers fail to recognise what is really important, because they generally do not distinguish main points from side issues. They will also tire quickly. After all reading takes a lot of energy from them, making the reading and understanding even more difficult after a while. According to Doak et. al (1996:6) their intelligence is often mistakenly regarded as another difference between poor and skilled readers. This, however, is a myth. Most low literates have average IQs. They can learn anything needed for their health care if it is appropriately taught (Doak et al., 1996:9). The problem is the difficulty of testing IQs of low literates, since most IQ tests require the ability to read.

2.1.3 Low literates and visual literacy

Definitions of visual literacy
The first people to experience difficulties while presenting visuals to low literate people were missionaries and early explorers (Hoffmann, 2000:136). They expected pictures to be universally understandable and were surprised when they were not understood. Researchers realised that comprehending pictures requires a special kind of literacy. The term Visual Literacy was first used 1969 by John Debes, editor of a series of newspapers by the name of *Visuals are a Language* (Avgerinou and Ericson, 1997; Taylor, 2003). Debes’ first attempt to define the term was the following:

“Visual Literacy refers to a group of vision-competencies a human being can develop by seeing and at the same time having and integrating other sensory experiences. The development of these competencies is fundamental to normal human learning. When developed, they enable a visually literate person to discriminate and interpret the visible actions, objects, symbols, natural or man-made, that he encounters in his environment. Through the creative use of these competencies, he is able to communicate with others. Through the appreciative use of these competencies, he is able to comprehend and enjoy the masterworks of visual communication” (Debes, 1969; in Avgerinou and Ericson, 1997:281)

Avgerinou and Ericson provide some other definitions suggested by scientists in the seventies and eighties:

- “Visual Literacy can be defined as a group of skills which enable an individual to understand and use visuals for intentionally communicating with others” (Avgerinou and Ericson, 1997: 281);
- “Visual Literacy is the ability to understand (read) and use (write) images and to think and learn in terms of images, i.e., to think visually” (Avgerinou and Ericson, 1997: 281).

According to Messaris (1998) visual literacy refers to knowing how visual media work and to be able to experience this consciously. Many more definitions have been formulated and criticized. It has been proven difficult to come up with one definition that satisfies people from all disciplines involved.

Arbuckle (2004) narrowed the definition of visual literacy down to arrive at one that is relevant for adult basic education, and thus for this research project. She came up with the term picture literacy:
“A simple definition of picture literacy is when a reader is able to understand pictures through an awareness of basic pictorial conventions, techniques and codes. Attaining picture literacy also means that, in addition to having the skills to understand or decode pictures, a picture-literate person should have a consciousness of the purposes or roles of images in different contexts” (Arbuckle, 2004: 450).

Low literacy and comprehension of visuals

In paragraph 2.1.2 the differences in reading skills between literates and low literates were outlined. Doak et. al also compared their reading habits of visuals, which resulted in table 2.2.

Table 2.2 The differences between skilled and poor readers in reading habits of visuals

<table>
<thead>
<tr>
<th>Skilled readers</th>
<th>Poor readers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systematically scan the visual to find the central concept</td>
<td>Eyes wander about page without finding the central focus of the visual</td>
</tr>
<tr>
<td>Quickly identify principal features</td>
<td>Skip over principal features</td>
</tr>
<tr>
<td>Separate key points from details</td>
<td>Eyes may focus on a detail</td>
</tr>
<tr>
<td>Quickly interpret information to arrive at meaning</td>
<td>Slow to interpret perceptual information; interpret words literally</td>
</tr>
</tbody>
</table>

The characteristics of visual literacy outlined in Table 2.2 mainly concern attention aspects. Previous research (Fuglesang, 1973; Hoffmann, 2000; Arbuckle, 2004, among others) often focussed on attention and recognition of analogical visuals too, such as the depiction of humans and animals or village life. However, for the modal visuals that are subject of this research not only attention is important, the visuals need to be comprehended. In paragraph 1.4 we have seen that except for recognizing the important aspects of a visual, comprehension also includes understanding and remembering the message and visually low literates have problems with those skills as well. Understanding requires good interpretation, yet low literates often interpret information literally. Sometimes conventional symbols and their meanings are not recognized and visual rehoric is difficult to recognise and comprehend too. Moreover, low literates fail to make use of the context to arrive at the intended meaning of a visual.
2.1.4 Visual literacy in South Africa

South Africa is one of the most developed African countries. Although many people are low literate, their visual literacy levels are quite high, especially in the urban parts of the country. Many citizens own a television these days and streets are full of advertising posters and billboards. Walls in clinics are covered with placards and leaflets can be found in most community centres. Consequently exposure rates are fairly high among urban South Africans and thus so are their general visual literacy levels. The opposite may be true for rural South African areas. Because of the low exposure to visuals, people in the more traditional parts of South Africa are expected to have lower visual literacy levels. In this regard it would be the most interesting to study their ability to comprehend abstraction in and the meaning of visuals on HIV/AIDS. However, this was not possible in this research project, due to time and opportunity constraints.

Still the differences in visual literacy levels between low literate and literate South Africans are interesting. Well educated, employed people have usually been more exposed to visuals and are therefore more familiar with visual conventions. Low literate people in South Africa are often unemployed and they hardly read, so their exposure to visuals is much smaller.

2.2 Previous research on low literacy and modal HIV/AIDS visuals

Quite a lot has been written on low literacy and its effects on visual literacy. According to Hoffmann (2000) previous reports mainly concern two categories: academic literature and practical reports. Together they cover a large area of research, from the history of media and art to teaching methods in adult education and from semiotics to art design. All areas are important when it comes to improving visuals in health documents so that low literates can better understand the messages expressed in them. However, this research is in the field of document design research. In this light two previous studies are of great interest. Carstens (2004b) and Carstens, Maes and Gangla-Birir (2006) studied the comprehension of instructional visuals on HIV/AIDS. They focussed on different levels of complexity or abstractness of those visuals and how low literate and literate South Africans deal with them. These two studies have provided interesting theories on low literacy and pictorial literacy, especially concerning visual abstraction. They form the basis of this study and will therefore be outlined next.
2.2.1 Carstens (2004b)

Theory and method
Carstens (2004b) has undertaken a qualitative research project in which she wanted to test the effectiveness of visuals commonly used in instructional information documents on HIV/AIDS in South Africa. In this project she focused on visual symbolism, since earlier research showed that pictures containing symbolism are likely to be problematic for low literate people. The three types of visuals she studied were symbolic-analogical, symbolic-abstract and indexical. These categories were based on theory by Hoffmann (2000).

Thirty low literate adult South Africans were individually interviewed by Carstens. First they engaged in a semi-structured conversation on the topic, to ensure that the respondents had adequate factual knowledge to interpret the visuals. After that the respondents were questioned about fourteen visuals from public information documents on HIV/AIDS in a semi-structured interview.

Results and Discussion
A qualitative analysis per visual was provided and interesting findings on the three types of visual abstraction were presented. In general, symbolic pictures caused problems. Especially conventional signs, such as hearts or thought balloons, were poorly understood, likely due to ambiguity or because they were contradictory to certain cultural beliefs. Indexical representations, e.g. facial expressions or a syringe and test tube indicating an HIV test, were sometimes well understood, where they caused problems in other pictures. According to Carstens these problems arise when a certain amount of contextual knowledge or experience with the topic is required.

In general, the findings in this research were consistent with previous research (Carstens, 2004b: 21). They supported the common idea that abstract representations are difficult to understand for low literate people and that this target group is likely to interpret a picture literally without assigning a higher-level instructional message to it.
2.2.2 Carstens, Maes & Gangla-Birir (2006)

Theory and method
This research project followed Carstens (2004b). The major difference is that both low literates and literates were included this time. Moreover, where Carstens (2004b) based her research on Hoffmann’s (2000) theory on sign categorisation and researched and analyzed her material accordingly, Carstens et. al (2006) explored the comprehension of different levels of complexity and abstractness. They used the same fourteen visuals that were used in Carstens (2004b). The effect of visual symbolism was investigated qualitatively, but they tried to focus on different levels of understanding through which participants process and understand visuals and the differences in understanding between low literates and literates.

In structured interviews 30 low literate and 24 literate South Africans were asked questions about the recognition of objects in the visuals, about the relationship between the objects and about the message being expressed.

Results and discussion
Carstens et. al (2006) found that analogical elements in the visuals are easily recognized by both literates and low literates. Also, differences between literates and low literates in the correct interpretation of visual elements increase when objects are more abstract or less embodied. Elements that are less concrete are more problematic for low literates. Symbols that are purely arbitrary cause the most interpretation problems for this group. On successes among low literates Carstens et. al (2006) furthermore conclude that:

- abstract elements that have an analogical residue, such as a cross, can be quite successful;
- actions and mental states are better understood when depicted using bodily expressions instead of abstract elements;
- metaphors that require certain cultural backgrounds are problematic when it does not correspond to that of the audience;
- less culturally specific metaphors are better, but not fully understood.

Carstens et. al (2006) note that there are some limitations to their research. Not all interpretation complexities are included and neither are sufficient examples for any problematic
type of complexity. Furthermore, low literate respondents were offered an introduction to the subject preliminary to the interview, in which they were told about situations depicted in the fourteen visuals. The literate group of respondents did not receive this contextual information, which can make up for some of the different results between the two groups. Moreover, this probably means that differences are even bigger normally.

2.2.3 The relevance of Carstens (2004b) and Carstens et. al (2006) for this study

The present research is a follow-up on the projects of Carstens (2004b) and Carstens et. al (2006). Interesting theories have been discussed and many important findings have been reported in their articles, yet there are a few limitations. Both studies were not conducted systematically. The interviews were only half structured, different interviewers were involved in Carstens et. al (2006) and the language spoken during the interviews often was not the mother tongue of the participants.

This research aims at replicating some parts of these studies in order to gain more solid results. A better research design will make up for previous limitations regarding interview language and the use of different interviewers. Moreover, the collection of data will be executed more rigorously, using more systematic questions aimed at gaining specific kind of answers from the respondents. Furthermore the effect of context provided to low literates will be tested using a version in which low literates are provided with extra information and a version in which they are not. Finally the data collection will be registered more accurately, so that it can be analysed more precisely. All improvements will lead to a better quality of the results and they will be more quantitative at the same time.

Moreover, both Carstens (2004b) and Carstens et. al (2006) mainly focussed on how specific concrete and abstract elements were comprehended by low literate and literate South Africans. Although both studies also included the comprehension of the intended message of the HIV/AIDS visuals they did not explicitly link the effect of different degrees of abstraction in visuals to the comprehension of the overall message. This study wants to gain more solid information on the comprehension of visual elements with different degrees of abstraction and study their effect on the comprehension of the intended messages of instructional visuals on HIV/AIDS.
2.3 Comprehending concrete and abstract elements in modal visuals

To comprehend the intended message of a modal visual a viewer must comprehend a number of aspects of that visual and combine their meanings to derive the ultimate message (Carstens et. al, 2006). Some of these pictorial elements might be easy to understand, others are more difficult. In general a gradual scale can be observed in terms of abstraction; going from analogical concepts that are easy to recognise to abstract concepts that are more difficult to comprehend. In this report six degrees on the scale of visual abstraction are distinguished: recognition of humans, recognition and comprehension of meaningful bodily elements, recognition of analogical objects, comprehension of conventional symbols, comprehension of metaphors and comprehension of metonymy. The next paragraphs outline these degrees of abstractness, using (parts of) the twelve modal visuals on HIV/AIDS that have been used for this research as examples. All visuals tagged ‘Visual 1’ through ‘Visual 12’ represent the research material as presented in appendix A.

2.3.1 Recognition of humans

Humans are the most concrete and embodied form of visual representation and therefore probably the easiest to recognised. We see humans daily and although no two humans look the same, they all share certain specific features that are encountered in every representation, such as eyes, a nose and a mouth. Even if they are depicted two dimensional or in a less realistic way (compare figures 2.1 and 2.2) we can still recognise them from our own bodily experiences.

![Figure 2.1](image1.png) ![Figure 2.2](image2.png)

No visual literacy is required, so no major recognition differences should be encountered between low literate and literate viewers. It is therefore expected, in the line of previous studies
(Carstens, 2004b; Carstens et. al, 2006) that the respondents will recognize all humans in the visuals.

For the comprehension of some visuals it is important to attribute the appropriate gender and the right role to the depicted humans. Carstens (2004b) and Carstens et. al (2006) researched the recognition of humans in twelve visuals on HIV/AIDS among South Africans and found that both low literate and literate participants were equally successful in recognising relevant relationships between humans. Only occasionally mistakes were made in visuals where the situation was not very familiar. For most visuals where problems can occur, however, assigning the correct roles to humans is not essential for comprehending the intended message. In this research comprehension of the correct genders and roles of depicted humans will only be tested when necessary for comprehension of the overall visual.

2.3.2 Recognition and comprehension of meaningful bodily elements

Bodily elements can be used to represent many things, a relationship for example. The boy and girl in Visual 3 are standing close together and the boy has wrapped his arm around the girl. Generally a guy and a girl are only close like this if they are a couple or perhaps if they just want to be intimate.

Facial expressions can tell a viewer something about the state of mind of humans depicted in visuals. The couple in Visual 8 is worried or scared. Even though their faces only consist of some stripes and dots, they still show their worry. We might have never seen faces drawn like this, but our previous experiences teach us that frown eyebrows and hanging corners of the mouth indicate worry. Other examples of bodily elements representing a state of being are the woman’s big belly indicating pregnancy in Visual 8 or blood to show someone is injured in Visual 7.

Sometimes bodily elements are used to represent speech. In Visual 1 the female adult is talking; her mouth is open and she is gesturing with her arm. It is an action that all people are familiar with, therefore it is easy to
recognise as talking or explaining. Visuals 2 and 4 also use bodily elements to represent speech.

In Visuals 5, 6 and 7 gestures are used to show a human is asking for something. The boy on the left in Visual 5 and the boy on the right in Visual 6 reach out their hand to an object the other boy is holding, indicating that they would like to have that object. The gesture in Visual 7 is ambiguous. According to the accompanied text in the Soul City brochure in which this visual was depicted the visual is about keeping children away from injured people, in order to avoid blood contact. However, the gesture can also be seen as a signal to ask the children to come closer. The woman might be afraid of helping the injured child, because of the risk of blood contact and therefore ask the children to come and help her. Either way, the gesture is an important element to arrive at the intended meaning of the visual.

Sometimes visuals try to convey meaning using other bodily elements. Examples in the research material can be found in Visuals 5 and 6. In Visual 6 the boy on the left has tucked up his sleeve and a bandage on his arm, showing that he wants to inject himself. The other boy has tucked up his sleeve too, indicating that he also wants to inject himself. These bodily elements show that this picture is about two boys who want to use the same injection; they are thus both necessary to understand the intended message of the visual. Visual 5 contains similar meaningful bodily elements. They are described in the analysis in appendix B.

Table 2.3 on the next page sums up all the bodily elements in the research material that need to be recognised and comprehended.
Table 2.3 Bodily elements and their inferences per visual

<table>
<thead>
<tr>
<th>Bodily element</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual 1</td>
<td>Open mouth and hand gesture</td>
</tr>
<tr>
<td></td>
<td>Woman is explaining</td>
</tr>
<tr>
<td>Visual 2</td>
<td>Open mouth</td>
</tr>
<tr>
<td></td>
<td>Father is talking</td>
</tr>
<tr>
<td>Visual 3</td>
<td>Embrace</td>
</tr>
<tr>
<td></td>
<td>Boy and girl are couple</td>
</tr>
<tr>
<td>Visual 4</td>
<td>Open mouth</td>
</tr>
<tr>
<td></td>
<td>Woman is talking</td>
</tr>
<tr>
<td>Visual 5</td>
<td>Beard growth of left boy</td>
</tr>
<tr>
<td></td>
<td>Left boy wants to shave himself/has beard</td>
</tr>
<tr>
<td></td>
<td>Gesture of left boy</td>
</tr>
<tr>
<td></td>
<td>Left boy wants to have object from right boy</td>
</tr>
<tr>
<td></td>
<td>Gesture of right boy</td>
</tr>
<tr>
<td></td>
<td>Right boy cut himself/just shaved himself</td>
</tr>
<tr>
<td>Visual 6</td>
<td>Sleeve of left boy tucked up and bandage around arm</td>
</tr>
<tr>
<td></td>
<td>Left boy wants to inject himself</td>
</tr>
<tr>
<td></td>
<td>Gesture of right boy</td>
</tr>
<tr>
<td></td>
<td>Right boy wants to have injection</td>
</tr>
<tr>
<td></td>
<td>Sleeve of right boy tucked up</td>
</tr>
<tr>
<td></td>
<td>Right boy wants to inject himself</td>
</tr>
<tr>
<td>Visual 7</td>
<td>Blood on girl’s knee</td>
</tr>
<tr>
<td></td>
<td>Child is injured</td>
</tr>
<tr>
<td></td>
<td>Woman’s gesture</td>
</tr>
<tr>
<td></td>
<td>Woman is stopping the children from coming closer or she is signalling</td>
</tr>
<tr>
<td></td>
<td>them to come closer</td>
</tr>
<tr>
<td>Visual 8</td>
<td>Big belly and hands on belly</td>
</tr>
<tr>
<td></td>
<td>Woman is pregnant</td>
</tr>
<tr>
<td>Facial expression</td>
<td>People look worried, sad or bad</td>
</tr>
</tbody>
</table>

All representations regarding visual prosody, such as gestures, postures and facial expressions are expected to be well understood by both literate and low literate audiences, since they are universal and identifiable from our own bodily experiences. PATH (2002) provides an example from the Philippines in which it becomes clear that gestures are better understood than conventional symbols. To portray the message: “do not take medicines unless prescribed by your doctor” picture 2.3 was presented to low literates. The doctor’s familiar gesture for saying “no”, or “don’t” was well understood, where a cross in a previous picture on the same subject was misinterpreted or even overlooked (PATH, 2002).
2.3.3 Recognition of analogical objects

Concrete representations in visuals are often true-to-nature representations of things we are familiar with. We can recognize them, because the image we see looks similar to its referent. These analogical elements of pictures are easy to understand, even for viewers who have a low visual literacy level. These kinds of representations do not require specific cultural backgrounds or knowledge of conventions to be understood. According to Hoffmann (2000: 140) “low literates only have problems recognizing unknown objects, and well-known objects depicted in a way that contradicts their experience”. Even representations that are not very realistic, such as the condom in picture x, should not cause problems for low literates. This is in line with Arnheim (1970), who writes:

*The perception of shape is the grasping of structural features found in, or imposed upon, the stimulus material. Only rarely does this material conform exactly to the shapes it acquires in perception.* (1970: 27).

This theory suggests that a new concept is perceived through familiarity with previous experiences. If you see a new book for the first time, you know it is a book even though you have not seen it before. The shape is familiar to most people, so it would not require a completely new visual interpretation (Johnson-Sheehan, 2002:85). All books share some principle features that allow a viewer to perceive them alike, ignoring subtle differences that are not important for correct perception. Thus art style of a visual should not have much influence on recognition of analogous objects.

Messaris (1994; in Carstens, 2004b), agrees with this. He claims that the way the brain identifies an object that is depicted on paper is almost the same way as it identifies an object observed in reality: outlines of objects and edges of surfaces are perceived through colour values and an array of light. “This results in a mental representation that can be thought of as corresponding to an outline drawing” (Carstens, 2004b: 14). This theory would account for the human ability to recognize and comprehend iconic representations, even if they are not very true-to-nature. According to Messaris (1994, in Carstens 2004b: 14) it suggests that this ability is “an extension of an everyday, real-life perceptual skill rather than something we have learned with specific reference to pictorial conventions”. In that case low literate and literate viewers
should be equally capable of correctly identifying and comprehending concrete representations in visuals.

2.3.4 Conventional symbols

All the visual elements we have seen so far are static and only depict a situation at a certain point. What if you want to visualize abstract concepts, such as ‘love’; dynamic situations, such as how a thunderstorm originates or a recommendation, such as ‘you should exercise regularly’? Then you will have to be creative and invent ways to depict them. That in itself is not so difficult, but you will want other people to understand your drawing. You will make agreements: ‘Let’s say that \( \heartsuit \) means ‘love’’. The more people accept and use this convention, the more it will become synonymous for it.

A red ribbon to represent HIV/AIDS is another example of a conventional symbol. It is an arbitrary sign, which means that the sign does not have any resemblance to the concept it represents. The only way we can know its meaning is through convention. Other conventional symbols that can be found in the research material are listed in table 2.4. Three conventional symbols (the thought and speech balloon and the cross) are used in more than one visual, sometimes with a slightly different appearance.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>plus, to add up</td>
</tr>
<tr>
<td>=</td>
<td>equals to</td>
</tr>
<tr>
<td>?</td>
<td>thought</td>
</tr>
<tr>
<td>?</td>
<td>speech</td>
</tr>
<tr>
<td>×</td>
<td>prohibition, danger, discouragement</td>
</tr>
<tr>
<td>♥</td>
<td>love</td>
</tr>
<tr>
<td>☐</td>
<td>encouragement, good, right</td>
</tr>
<tr>
<td>✓</td>
<td>HIV/AIDS</td>
</tr>
</tbody>
</table>

It is expected that South Africans with low literacy levels will experience more difficulty when they are exposed to conventional symbols than literate South Africans. Many South Africans have grown up (almost) without formal schooling, without television and without books with pictures. Consequently, they are not as familiar with symbols and metaphors and their meanings. Even though the respondents in this study are from an urban part of South Africa,
where they are often exposed to billboards, leaflets and the like, the lack of good, adequate education and employment will presumably lead to lower scores on the comprehending of conventional symbols and metaphors for low literate South Africans in comparison with the literate respondents.

### 2.3.5 Metaphors

Metaphors are another form of representation of abstract concepts. Deutscher (2005): ‘metaphor is the chief mechanism through which we can describe and even grasp abstraction’.

At first sight visual metaphors look like analogous objects, but they represent something else. Literally interpreted, the object in figure 2.5 could be called a monster. In Visual 8 however, it is used as a metaphor to symbolize a virus; or more specific: the HIV virus. The main difference with conventional symbols is the relationship between the sign and its referent. Whereas symbols are completely arbitrary, it is the similar characteristics between a metaphor and the concept it depicts that are necessary to understand the intended meaning. A metaphor always consists of two domains (Croft and Cruse, 2004): the target domain (the concept that is being represented, the referent) and the source domain (the concept that is being used to describe or depict the target domain). In the example in figure 2.5 the HIV virus would be the target domain, where the monster is the source domain. A characteristic of the monster that can be projected on the target domain is for example ‘dangerous’. Furthermore, the entire picture could be seen as an aggressive blood cell, which is also a characteristic of HIV.

Metaphors can cause interpretation problems for two reasons. First they are difficult to recognise; a viewer needs to know when to interpret something literally and when figuratively. Second, metaphors often are difficult to understand. A viewer often needs the context to arrive at the intended meaning of the metaphor. Interpreting metaphors that are not conventional always requires a cognitive load, but considering what is needed to succeed it is understandable that low literate viewers especially experience a lot of problems. Not only are they likely to interpret things literally; they miss the context too. It is therefore expected that low literate South Africans score lower on comprehending metaphors then their literate compatriots.
2.3.6 Metonymy

Sometimes a well-understood and easy to perceive concept is used to stand for a more complex entity; e.g. for that particular concept as a whole, for that concept in general or for something with which it is associated. This rhetorical form of representation is called metonymy. A clear example of metonymy can be found in Visual 3, where the bed and the clothes on the floor stand for sexual activity. Table 2.5 lists the other examples of metonymy in the research material.

Table 2.5 Examples of metonymy in research material

<table>
<thead>
<tr>
<th>Concrete representation</th>
<th>Stands for</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual 1 picture of a family</td>
<td>reproduction</td>
</tr>
<tr>
<td>Visual 3 a bed and clothes on the floor</td>
<td>sexual intercourse</td>
</tr>
<tr>
<td>Visual 9 white bread and can of soda</td>
<td>unhealthy food in general</td>
</tr>
<tr>
<td>Visual 10 brown bread, cheese and orange</td>
<td>healthy food in general</td>
</tr>
<tr>
<td>Visual 11 playing football</td>
<td>sporting/exercising in general</td>
</tr>
<tr>
<td>Visual 12 sitting and reading a book</td>
<td>relaxing in general</td>
</tr>
</tbody>
</table>

In order to understand metonymy in visuals a viewer needs to realize that some analogical objects should not be interpreted literally, but in a more abstract way. As was made clear in paragraph 2.1.3 low literate people are slow to interpret perceptual information from visuals and they are likely to interpret information literally. It is therefore expected that they are not good in recognising metonymy, as opposed to literates.

2.4 Comprehending the intended message of a modal visual

The most abstract aspect of instructional visuals is modality. Viewers are supposed to use analogy as an inference strategy, i.e. “they have to interpret the visual not so much as simply showing familiar scenes or facts of life, but rather as prescriptions of what they should do or refrain from doing” (Carstens et. al, 2006:227). Sometimes modality can be expressed using a conventional symbol, such as a cross or a tick. If that symbol is understood, modality will
probably be recognised. All visuals from the research material convey modality, yet only five make use of modality signals (Visual 5 for example). Viewers thus often have to rely on additional inferences to recognise the ultimate advice or discouragement. Furthermore, viewers have to apply situations that they see to themselves, yet low literates often fail to recognise that the message has a personal relevance. To the question: “What do you think Visual 5 wants to tell you?” a low literate person for instance might say: “It tells me that the left boy is not allowed to use the razor that the left boy just used” instead of “it tells me that I should not use a razor that someone else just used”.

When no modality signals are used it is expected that both low literate and literate participants will experience difficulty in recognising modality. However, literates are more likely to realise that a visual not just wants to show something but rather wants to teach something too. Therefore it is expected that they will recognise a recommendation more easily than low literate viewers.

When all the visual elements that were outlined in paragraph 2.3 are comprehended and when modality is recognised, a viewer needs to combine their meanings and should then be able to arrive at the correct intended message of a visual, in the form of a recommendation.

2.5 The effect of providing context to participants

The overall context of the visuals used in this research is HIV/AIDS, or more specific: how to act to prevent infection or how to live if you are infected. According to Doak et. al (1996) it is important to provide a context if you want to teach something new. It provides a framework within which new information can be interpreted. At the start of the interviews the participants were therefore told that all the visuals shown were about HIV/AIDS and that they could see that because of the red ribbon depicted on every visual. It was questioned, however, whether this one time mentioning of the subject was sufficient for the low literate audience. Paragraph 2.1.2 and 2.1.3 outlined that low literates often miss the context and it was therefore hypothesised that after a while the respondents would stop using this information while processing and trying to comprehend a visual. Moreover, low literates are expected to have less general knowledge about preventing HIV and living with HIV than the literate participants.
Carstens (2004b) and Carstens et. al (2006) therefore decided to give low literate participants a semi-structured briefing on the topic previous to the interviews. This briefing dealt with sexual debut, prevention of HIV and coping with HIV illness (Carstens et. al, 2006: 224). Literates did not receive this framework, a decision that might have biased some of the results. According to Carstens et. al omitting this information in the low literate group would certainly have resulted in more dramatic differences. “On the other hand, providing the literate respondents with the same explicit framework would have made the task too simple” (2006: 229).

In this study a compromise was sought. Through providing a framework to half of the low literate respondents and omitting it in the interviews with the other half the effect of context can be tested. Results will show whether differences in results are indeed more dramatic if low literates do not receive a framework. Moreover, they will make clear whether data from literates and low literates can be compared if both groups are not provided with context. These results can be interesting for future research on this topic.

2.6 Research hypotheses

As introduced in the first chapter, the main research question is:

**What is the effect of visual abstraction in modal HIV/AIDS visuals on comprehension of the intended message by low literate and literate South Africans?**

In order to answer this question it is necessary to investigate how abstract elements in visuals on HIV/AIDS are understood in comparison with concrete elements and how the intended messages of visuals containing such abstract elements is comprehended.

In the previous section expectations have been discussed regarding the effect of literacy and provided context on the recognition and comprehension of concrete and abstract elements in visuals as well as on the comprehension of the intended messages of these visuals. The hypotheses concerning the influences of these effects are discussed in paragraphs 2.6.1 and 2.6.2. They will consequently lead to hypotheses regarding the effect of visual abstraction on comprehension of the intended message by low literate and literate South Africans in paragraph 2.6.3.
2.6.1 The effect of literacy and provided context on recognition and comprehension of concrete and abstract visual elements

The theoretical framework provided expectations regarding the recognition and comprehension of six concrete and abstract elements that can be found in modal visuals on HIV/AIDS. It is expected that for both low literates and literates the proportion of recognised visual elements decreases as the elements are less familiar and less related to their own bodily experiences. Humans and meaningful bodily elements will be more easily recognised than non-human analogical objects; analogical objects will be better recognised than abstract elements such as conventional symbols and metaphors and these abstract elements will be more easily recognised and comprehended than metonymy. These expectations lead to the first hypothesis.

**H1a:** The proportion of recognised visual elements decreases as the elements are less familiar and less related to their own bodily experiences.

According to Carstens et. al (2006) the difference in recognition and comprehension between literate and low literate participants will increase as the visual elements are less concrete and embodied. This is in accordance with the sections on the six kinds of visual elements that are of importance in this study. Concrete elements are expected to be almost equally well understood, whereas abstract elements will be better recognised and comprehended by literates than by low literates.

**H1b:** The difference in recognition and comprehension between literates and low literates increases as the visual elements are less concrete and embodied.

Context is another factor that might be of influence on the recognition and comprehension of visual elements. The paragraphs on humans, meaningful bodily elements and analogical objects show that the recognition of these concrete visual elements is not expected to be depended on provided context. However, providing a framework might be important for low literates when they are confronted with more abstract forms of representation that they are not familiar with. It might guide them into thinking in the right direction.

**H1c:** The difference between low literates who did not receive context and low literates who did receive context increases as the objects are less concrete and embodied.
2.6.2 The effect of literacy and provided context on comprehension of the intended message

This research project focuses on visuals that represent deontic modalities: all twelve visuals from the research material express recommendations on preventing or living with HIV or AIDS. These intended messages are portrayed using the concrete and abstract visual elements outlined in the theoretical framework. Paragraph 2.4 showed that all of these visual elements have to be recognised and comprehended and their meanings have to be combined in order to derive the ultimate message. Since low literate viewers are likely to experience more problems with recognising and comprehending abstract elements in visuals than literates it is expected that comprehending the intended message of a visual is easier for literates than for low literates.

H2a: Recognising the correct intended meaning is easier for literates than for low Literates.

The context that half of the low literate respondents will receive with every visual will help the respondents to think in a certain direction; it is basically a very broad explanation of what the visual is about and introduces the subject of HIV/AIDS every time. Moreover, in a few cases the context reveals that the visual is a recommendation. It is expected for these reasons that comprehending the intended message is easier for low literates if they receive context.

H2b: Recognising the correct intended meaning is easier for low literates that did receive context than for low literates that did not receive context.

2.6.3 The effect of visual abstraction on comprehension of the intended message

The visuals in the research material all contain different numbers and forms of concrete and abstract representation. Some are purely analogical at first sight, whereas others contain one or even more abstract elements, such as conventional symbols, metaphors or metonymy. The kinds of intended messages differ too. Some are quite simple and can be represented without using many abstract elements; others are more complicated and require many kinds of abstract representation. It is expected that it will be more difficult for all respondents to comprehend the intended message of a visual as the level of visual abstraction increases.
H3a: It will be more difficult for low literates and literates to comprehend the intended message of a visual as the level of visual abstraction increases.

However, this will be more so for low literates than for literates and more so for low literates that did not receive context than for low literates that did receive context. After all literate viewers are more likely to comprehend the abstract elements than low literates and the context that half of the low literate respondents receive provides a framework within which the abstract elements can be recognised and comprehended more easily. These expectations lead to hypotheses H3b and H3c.

H3b: The difference in recognising the correct intended meaning of a visual between low literates and literates will increase as the level of visual abstraction increases.

H3c: The difference in recognising the correct intended meaning of a visual between low literates that did receive context and low literates that did not receive context will increase as the level of visual abstraction increases.
3. Method

The aim of this experiment is to study the effect of visual abstraction in modal HIV/AIDS visuals on the comprehension of the intended message by low literate and literate South Africans. Data from low literate participants was collected through structured interviews in Pretoria, South Africa. Thirteen high educated South Africans completed a questionnaire comparable to the interview questions.

3.1 Material

In this paragraph the selection, pretesting, analysis and presentation of the research material will be described.

3.1.1 Selection of visuals

Twelve visuals were selected as research material (see appendix A). They were taken from various public health documents on HIV/AIDS, collected between 1999 and 2005. Since the research projects conducted by Carstens (2004b) and Carstens et. al (2006) form the basis of this study, I have used almost the same research material. Carstens (2004b) and Carstens et. al (2006) used fourteen visuals on HIV/AIDS; I have included nine of them in my material and added three new ones from the same kind of brochures. The final twelve pictures together represent a clear story of AIDS. They can be roughly divided into two categories: the first seven pictures discuss how to reduce the chance of getting infected or infecting someone else whereas the other ones are about how to live if you have HIV or AIDS.

The adaptation of the original selection of visuals mainly resulted from the more systematic and structured design of this study. The research material should consist of visuals that want to express modal messages concerning HIV/AIDS and that make use of humans, meaningful bodily elements, analogical objects, conventional symbols, metaphors and metonymy to represent that message. In order to provide quantitative data I tried to include two or more examples of every level of abstract representation (e.g. two visuals that made use of a thought
balloon). Therefore three new visuals were added to the consisting material. To reduce the
cognitive load for the respondents it was decided to exclude five other visuals that were either
concrete instead of abstract or that consisted of visual elements that were already sufficiently
present in the research material.

3.1.2 Pretesting of visuals

The final selection was pretested during a test interview, which also served as a test for the
researcher and the interpreter. A low literate male respondent from Atteridgeville, Pretoria, was
invited to be interviewed. The procedure for this interview was the same as for the other
interviews in the main experiment.

This test interview provided a lot of information, such as difficulty of the visuals, length of the
interview and effort for the respondent. Two important changes resulted from it. It was decided
not to ask questions about the appreciation of the visuals, which was the intention initially,
since the interview already took quite some time and it was not important for this research
project. Furthermore it was decided to depict a red ribbon on each of the pictures. Carstens
(2004b) advised to include a red ribbon in pictures to help viewers not to lose sight of the fact
that all the pictures are about HIV/AIDS and the test interview indeed showed that it was a fact
that was easily forgotten.

3.1.3 Analysis of visuals

In appendix B all twelve visuals are given, along with an analysis of their interpretation. Each
visual has been described and the intended message has been given. The theory in chapter 2
was used to describe possible interpretation difficulties for low literates.

3.1.4 Presentation of visuals

There were two different ways in which the material was presented to the respondents. The low
literate participants were provided with visuals that were printed on cardboard and plasticized;
the literates received them printed on paper. In three cases of the second version, where the
research was conducted digitally, the visuals were presented in the same digital Word document as the questions.

3.2 Respondents

Forty low literate and thirteen literate respondents participated in this research. However, the years of schooling of six low literate respondents exceeded the previously proposed limit of eight years; they were therefore excluded from the analysis. The years of schooling that the remaining thirty-four low literate participants had received varied between no schooling at all and eight years (mean = 6.24). Most of them were unemployed (only five low literate respondents said to have a job, of whom two were self employed, one had a temporary job and one was only working occasionally).

The low literate participants, of whom eighteen were male, were sixteen to sixty years old (mean = 35.0). They all lived in Atteridgeville, Pretoria, except for four respondents who lived in other parts of Pretoria. All low literates had an African language as their mother tongue. Most of them spoke Setswana (61.8%) and Sepedi (26.5%).

The literate respondents received education for fourteen to twenty-two years (mean = 17.15); all were employed and lived in Pretoria. Six of the thirteen literates were male. Afrikaans was the mother tongue of all literate participants except for one, whose first language was Setswana.

3.3 Design

This research was carried out using a between-subjects design. The distribution of the questionnaire versions over literacy levels is shown in table 3.1. Two groups of respondents, low literates and literates, were assigned to one of two questionnaire versions: one where context was provided with every visual and one where no extra information was provided with every visual. Low literates were randomly assigned to one of the two interview versions. At the end this was sometimes done according to what literacy level was needed in a version to make them as homogenous as possible. An independent-samples t-test showed that the mean literacy
level did not differ for both low literate groups (t(32)=.48, p=.63). All literates were assigned to
the version where no context was provided, since the effect of context was only tested for low
literate respondents.

Table 3.1 Distribution of the two questionnaire versions (without context and with context)
over literacy levels

<table>
<thead>
<tr>
<th>Questionnaire without context</th>
<th>Questionnaire with context</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low literates 20 14</td>
<td></td>
</tr>
<tr>
<td>Literates 13 0</td>
<td></td>
</tr>
</tbody>
</table>

3.4 Instrumentation

Low literate respondents were questioned in interviews, since most of them have poor reading
and writing skills. These interviews were recorded using a webcam and a microphone that were
installed on a laptop. The media files were transcribed afterwards. Due to time constraints it
was not possible to conduct interviews with the literate participants; therefore they were asked
to complete a questionnaire.

3.4.1 Questionnaire

The questionnaire that was presented to the respondents consisted of an introduction, five
personal questions (on native language, gender, age, occupation and number of years of formal
education received) and two to eight questions about every visual.

The introduction varied slightly for the low literates who participated in interviews and the
literates who completed a questionnaire. An example of both introductions can be found in
appendix C. In both questionnaire versions, however, the introduction explained the intention
of the questionnaire and what was expected from the respondent. Furthermore it introduced the
subject of HIV/AIDS and made clear to the respondents that all visuals would be about
HIV/AIDS and that the red ribbon depicted on every visual showed this. The introduction for
the interviews furthermore emphasized that answers could not be wrong or right, but that only
the respondents’ opinion was of interest. According to Linney (1995:28) this is important; respondents have to know that it is not they who are being tested, but the visuals.

The questions in the questionnaire for the literate respondents also differed slightly from the interview questions. Both versions are included in appendix D. The first questions always were about what the respondents saw in the visual or in specific parts of the visuals. The last question always was ‘what do you think this picture wants to tell you?’ The questions in between differed and focused on specific elements of a visual. They too, however, followed a structured scheme.

The most important difference between the two versions is that low literates were always first asked ‘what do you see in this picture?’, whereas for the literate respondents the first question immediately focused on a specific aspect of the visual (‘what do you see in this part of the picture?’) Only in Visuals 7 and 8 the literates were also first asked what they saw in the visual as a whole. Furthermore in Visuals 7 and 8 some questions were combined. In Visuals 9, 10, 11 and 12 a few questions were omitted, since the interviews had made clear that they would not provide useful data. Moreover, in the interviews questions about specific parts of the visual were accompanied by pointing those elements out in the interviews. Obviously, this was not possible for the questionnaires. To make up for this difference, it was decided to reproduce those specific elements that were questioned left of the question.

3.4.2 Context

The effect of provided context on comprehension of specific visual elements and the intended message of a visual by low literates was tested using two different interview conditions. In one condition context was provided each time a new visual was introduced to a participant and in the other condition this extra information was not provided. The extra information was presented in one sentence each time. These sentences are listed in table 3.2 on the next page.
### Table 3.2 Overview of provided context per visual

<table>
<thead>
<tr>
<th>Visuals</th>
<th>Provided context</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 and 2</td>
<td>This visual is about giving sexual information to children</td>
</tr>
<tr>
<td>3, 4, 5, 6 and 7</td>
<td>This visual is about living in such a way that the chance of getting infected with HIV is small</td>
</tr>
<tr>
<td>8</td>
<td>This visual is about making the decision to do an AIDS test</td>
</tr>
<tr>
<td>9, 10, 11 and 12</td>
<td>This visual is about how you should live when you are HIV positive</td>
</tr>
</tbody>
</table>

### 3.5 Procedure

This section describes how the respondents were recruited, which venues were used for the interviews, in which language the respondents were questioned and how the data collection was carried out.

#### 3.5.1 Recruiting respondents

Except for the first four respondents, whom I personally recruited with help from my first interpreter, all respondents were recruited by my second interpreter. Every morning on the day of the interviews she spoke to people on the street and asked them about the years of schooling they had had. If a person sufficed to the requirements, she wrote down his or her name and asked them to come to the venue at a certain time. The respondents were paid 20 Rand (about 3 euros) at the end of the interview as an acknowledgement. The interpreter did not talk about this reward while recruiting participants, to minimize the chance of them lying about their education level.

Ten of the literate respondents were recruited through contact with the manager of the Coram Deo counselling centre in Waterkloof Glen, Pretoria. She arranged that the questionnaires be filled in by a group of voluntary counsellors who were following a course in narrative therapy at the centre. The other three literate respondents were scientists working at the Nuclear Energy Corporation of South Africa.
3.5.2 Site

The interviews took place in two venues. The first four interviews were held in the house in which I lived during my internship in South Africa, in Hatfield, Pretoria. The venue was good; although it was difficult to find respondents in this area. With help from the Centre for the Study of Aids at the University of Pretoria, a new site was found. There were rooms available in the Saulsville clinic in the township Atteridgeville in Pretoria. Many people in Atteridgeville are unemployed and low literate, so it was no problem to recruit respondents there.

3.5.3 Language

All interviews were held in the mother tongue of the respondents, in order to allow respondents to express themselves adequately. During most interviews Setswana (61.8%) or Sepedi (26.5%) was spoken. Others were held in IsiZulu or Tsotsi-taal in combination with Setswana or Sepedi.

During this experiment there were two interpreters who translated for me. The name of the first interpreter is Kerapetse Ntsimane, a second year law student at the University of Pretoria. His home language is Setswana and English is his second language. Moreover, he knows Sesotho and Sepedi. The interview venue was changed after the first four interviews and at the new venue another interpreter assisted me. Tebogo Molako is a 29 year old community worker from Atteridgeville, Pretoria. After her metric she did a carpentry course and a number of different workshops, among other things one on HIV/AIDS. Now she is a facilitator and counsellor at the clinic where the interviews have taken place and also at other places. Besides English, she is a fluent speaker of Setswana, Sepedi and IsiZulu. She also knows some Tsonga and Afrikaans.

To make sure the interpreters asked the questions correctly and translated accurately Ms. R.M. Ramagoshi from the department of African Languages at the University of Pretoria was approached. She listened to selected parts of the interviews, and commented that the interpreting was of a high standard.

Afrikaans was the native language of all literate participants except for one. Since it was expected that highly educated, employed South Africans were good in reading and writing in
English, it was decided to present them the questionnaires in this language. This never led to misinterpretation problems, although two respondents chose to answer in Afrikaans.

3.5.4 Procedure of a data session

The low literate respondents have been interviewed. After they were welcomed and offered a drink and snack the interpreter read the introduction out loud. In this introduction all respondents were asked for permission to record the interviews. Some respondents were not happy with the video registration; in those cases the interpreter was filmed instead of the respondent. After the introduction the interpreter presented the first visual and asked the accompanying questions that were printed on paper. The researcher looked after the recording of the interviews and made sure that all the questions were asked in the right order. In the few cases that this was not the case the interpreter was notified. At the end of the interviews the personal questions were asked. After that they were thanked for their participation and rewarded with 20 Rand.

Most interviews lasted about half an hour. Some were finished after 20 minutes, whereas one interview almost took 45 minutes. No signs of fatigue were observed among the participants. During an interview no other people would be in the room except for the interviewee, the interpreter and the researcher. Now and then someone would knock on the door to ask something, but after this disturbance the interview continued if nothing had happened. If necessary the interpreter would repeat the last question. According to the observations of the researcher these occasionally disturbances did not have an influence on the responses of the respondents.

The questionnaires were distributed while the literate respondents were sitting around a conference table in the lecture hall. The facilitator explained the purpose of the research, after which the respondents were asked to complete the questionnaires. After approximately half an hour the questionnaires were collected.
3.6 Data analysis

Apart from a qualitative analysis data from both low literate and literate respondents was also quantitatively analysed using the program SPSS. Frequency reports were obtained and one-way and two-way analyses of variance (ANOVA) were used to describe the results.
4. Results

This chapter describes the results of the interviews and questionnaires that were conducted to investigate the effect of visual abstraction in visuals on HIV/AIDS on comprehension of the intended message by low literate and literate South Africans. The results will be presented in two categories:

- The recognition and comprehension of six degrees of visual abstraction
- Comprehension of the correct intended message of visuals

A qualitative analysis on how all visuals were comprehended individually is included in appendix E.

4.1 The recognition and comprehension of concrete and abstract visual elements

It was hypothesized that for both low literates and literates the proportion of recognised visual elements decreases as the elements are less familiar and less related to their own bodily experiences. Furthermore it was expected that literacy and provided context are of influence on these results.

The recognition and comprehension of concrete and abstract elements was tested using specific questions regarding what respondents saw in the visuals and whether they knew the meaning of those visual elements. Table 4.1 on the next page provides an overview of the recognition and comprehension of six concrete and abstract visual elements included in the visuals.
Table 4.1 Mean percentages of concrete and abstract visual elements being recognised by three groups of respondents

<table>
<thead>
<tr>
<th></th>
<th>Low literates without context (n=20)</th>
<th>Low literates with context (n=14)</th>
<th>Literates (n=13)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete representation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>humans (n=13)</td>
<td>97.7</td>
<td>97.3</td>
<td>93.6</td>
</tr>
<tr>
<td>meaningful bodily elements</td>
<td>50.4</td>
<td>53.8</td>
<td>82.2</td>
</tr>
<tr>
<td>analogical objects (n=11)</td>
<td>90.5</td>
<td>94.2</td>
<td>98.4</td>
</tr>
<tr>
<td>Abstract representation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>conventional symbols (n=15)</td>
<td>57.7</td>
<td>62.9</td>
<td>90.3</td>
</tr>
<tr>
<td>metaphor (n=1)</td>
<td>20.0</td>
<td>7.1</td>
<td>53.8</td>
</tr>
<tr>
<td>metonymy (n=6)</td>
<td>62.5</td>
<td>75.7</td>
<td>87.2</td>
</tr>
</tbody>
</table>

Table 4.1 shows that concrete elements are better recognised than abstract elements and that literate respondents recognise more visual elements correctly than low literates. A two-way analysis of variance (ANOVA) with abstraction level (concrete representation, abstract representation) as a within-subjects variable and respondent group (low literate without context, low literate with context, literate) as a between-subjects variable shows a main effect of abstraction (F=42.46 (1,38), p<.001) as well as of respondent group (F=9.43, p<.001). There is also an interaction effect of abstraction level by respondent group (F=7.95, p=.001).

A one way analysis of variance (ANOVA) shows that literate respondents score significantly higher on the recognition of abstract elements than low literates from the context version (p<.005) and low literates from the version without context (p<.001). There is also an effect on the recognition of concrete visual elements: low literates that did not receive context recognised fewer concrete elements than literate respondents (<.025).

However, these results are means. Individual scores for the different degrees of visual abstraction sometimes differ enormously. These results can thus be more differentiated and need a qualitative analysis to provide more meaningful results. In the following paragraphs the results per degree of abstraction will be discussed more elaborately, structured from most concrete visual elements to most abstract elements.
4.1.1 Recognition of humans

Table 4.1 shows the mean percentages of the recognition of humans (13 individuals, duos or trios in 10 visuals) for the three respondents groups. As expected most humans in the visuals were recognised by low literate and literate respondents. Only occasionally a low literate respondent would overlook the people in the bed in Visual 3 or the kids in the background in Visual 8. Literate respondents did not always mention all humans literally, but rather figuratively. In Visual 3 for example they were more likely to say they saw ‘sex’ than recognising two people in a bed. This can explain the lower score of the literate respondents. Art style was not of influence on the recognition of humans in the visuals. Humans in the cartoon style visuals were equally well identified as humans in the more realistic visuals.

All main characters in the visuals were recognised by the respondents as being human, although sometimes the wrong gender was assigned to a human. In Visual 2 three respondents interpreted the two humans as a man and a woman and in Visual 5 the same mistake was made five times. Furthermore, in both visuals a small number of respondents expressed having doubts about the genders. This vagueness might have been caused by the rather feminine look of the boy on the right in Visual 5 and the boy on the left in Visual 2. However, the situation depicted in the two visuals could be confusing too. The condom in Visual 2 might be thought of as something used or talked about between people from opposite sexes. Visual 5 was quite often related to sex too. The razor blade was mistaken for a condom by a few low literate respondents and the fact that both humans have bare upper bodies is base for misinterpretations as well; three low literate respondents thought that the person on the left wanted to have sex with the person on the right. Again, this situation might be expected in a male-female context rather than in a male-male situation.

Roles of humans in the visuals were not always correctly interpreted either. In Visual 2 the adult male was seen as a doctor four times, all four in the version where no context was provided. Two respondents thought that Visual 3 was about a father and a daughter.

4.1.2 Recognition and comprehension of meaningful bodily elements
The recognition and comprehension of meaningful bodily elements was tested by analysing whether the intention of these bodily elements was understood. The mean percentages of respondents understanding the intention of meaningful bodily elements are listed in table 4.1. An overview of the results per bodily element is given in appendix F.

The results show that in general literates comprehend the meaning of bodily elements in visuals much better than low literates, which was not expected. A one way analysis of variance (ANOVA) shows that literate respondents score significantly higher on the recognition of abstract elements than low literates from the context version ($p<.005$) and low literates from the version without context ($p<.001$). Whether low literates receive context or not is not of influence on their score ($p=.89$). The overview in appendix F makes clear, however, that there are many differences in results between the kinds of bodily elements present in the visuals. They are therefore analysed more specifically. Table 4.2 provides an overview of the results according to four kinds of meanings expressed by the bodily elements.

Table 4.2 Mean percentages of four types of bodily elements comprehended by low literate and literate respondents

<table>
<thead>
<tr>
<th>Bodily elements</th>
<th>Low literates without context</th>
<th>Low literates with context</th>
<th>Literates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bodily elements to represent a state of being (injured, pregnant, worried) (n=3)</td>
<td>55.0</td>
<td>57.1</td>
<td>89.7</td>
</tr>
<tr>
<td>Bodily elements to represent speech (n=3)</td>
<td>55.6</td>
<td>71.4</td>
<td>87.2</td>
</tr>
<tr>
<td>Gestures to ask for something (n=3)</td>
<td>66.7</td>
<td>47.6</td>
<td>82.1</td>
</tr>
<tr>
<td>Bodily elements implying something happened or is going to happen (n=4)</td>
<td>41.3</td>
<td>42.9</td>
<td>73.1</td>
</tr>
</tbody>
</table>

The bodily elements that imply something happened or is going to happen in Visuals 5 and 6 are least comprehended by all respondent groups. These elements were all very small and therefore probably overlooked. The same is true for bodily elements to represent a state of being. Especially the pregnancy of the woman in Visual 8 was poorly recognised. However, this too is more likely due to the art style of the visual than to the kind of representation. As expected the worried look on the faces of the couple in Visual 8 was well recognised, although one respondent did not notice it at all. When he was asked how he thought the couple looked and felt he answered: “they look happy because they are smiling”.

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There is a striking difference between low literates who did receive context and low literates who did not in the recognition of speech in the first two visuals. Receiving context has a positive effect on recognising that the mother in Visual 1 and the father in Visual 2 are talking or explaining. It is likely that the nature of the context is to account for this effect, since the extra information given to respondents on those two visuals dealt with giving sexual information to children, which implies something is being explained.

Literate respondents recognised speech more easily than low literates. This might be due to the fact that literates recognised the speech balloon that was used to represent speech in two of these visuals. However, there are no major differences in the recognition of speech between visuals with a speech balloon and the visual without a speech balloon.

4.1.3 Recognition of analogical objects

It was expected that the recognition of analogical objects would not be problematic. Table 5.1 shows the mean percentage of analogical objects correctly identified by low literate and literate respondents. In general all analogical objects were well understood by all respondent groups, as was hypothesized. A one-way ANOVA showed no significant differences between the three respondent groups in the recognition of analogical objects.

Art style was again not important. The razor blade and injection were wrongfully identified the most, which is probably due to the fact that they were small and hold by a human, and thus not fully depicted. The orange was sometimes interpreted as a tomato. A table with the scores for all individual analogical objects is included in appendix F.

4.1.4 Comprehension of conventional symbols

The conventional symbols in the research material were expected to be well comprehended by literate respondents, but rather poorly understood by low literates. Table 4.1 shows the mean percentages of conventional symbols that were comprehended by the three groups of respondents. In appendix F a complete table with the comprehension scores for all individual conventional symbols can be found.
A one-way ANOVA shows that literates scored better on the comprehension of conventional symbols than low literates who did not receive context (p<.001) and better than low literates who did receive context (p<.005). There is also a difference between the two low literates groups, but this is not significant. Low literates who received context correctly comprehended more conventional symbols than low literates who did not receive context, yet this difference is not significant (p=.73) The difference between the two low literate groups is most striking regarding the comprehension of thought and speech balloons.

Crosses and a tick where best comprehended by all respondents. Thought and speech balloons were the most problematic for low literates, as well as the text on the shirt of the boy in Visual 3. However, the meaning of this text was not questioned specifically and was therefore not mentioned often at all. It is striking that the plus and equals to sign were quite poorly comprehended by low literates (50 percent recognised the plus sign, around 40 percent correctly identified the equals to sign), while more than 80 percent of them recognised the question mark as such.

4.1.5 Recognition and comprehension of metaphors

Only one clear example of a metaphor was present in the research material and congruent with expectations it was poorly understood. Table 4.1 shows the percentage of respondents comprehending the metaphor in Visual 8.

Only a few low literates recognised that the monster in Visual 8 represents the HIV virus or AIDS. The context that was given to a number of low literates did not help them, although AIDS was mentioned in the extra information. 30.8 percent of the literates understood the metaphor. Some respondents did interpret the monster as a virus, but failed to see it as HIV/AIDS. Low literates sometimes interpreted the monster as blood or as a representation of the unborn child (“this woman is thinking that maybe she’ll get a disabled baby or some kind of baby, but not a normal baby”). Five low literates said they did not know what the monster meant. Although almost 70 percent of the literates did not interpret the monster correctly, they often did interpret it figuratively, e.g. as insecurity or scary thoughts.
4.1.6 Recognition and comprehension of metonymy

Six visual elements in the twelve research visuals had to be interpreted figuratively. It was expected that this would be problematic for respondents, more so for low literates than for literates. Table 4.1 shows the mean percentages of forms of metonymy being recognised by low literate and literate respondents. Table F4 in appendix F provides the results per form of metonymy.

A one-way ANOVA shows no significant differences between both low literate groups (p=.13) and between low literates from the context version and literates (p=.26). However, there is a significant difference between low literates who did not receive context and literate respondents. Literates recognise metonymy more often than low literates that did not receive context (p<.005).

4.2 Comprehension of the intended message of visuals

All respondents were asked what they thought the message was that the visuals wanted to convey. The answers were compared to the intended meanings of all visuals as proposed in appendix B.

4.2.1 Recognition of modality in visuals

To classify an answer as being the correct intended meaning it is not only important to correctly recognise and comprehend the various visual elements and combine their meanings. The answer also needs to contain a form of modality: a respondent must recognize the instructional intent of the visual, e.g. an advice or discouragement. Table 4.3 on the next page shows the mean number of times low literate and literate respondents recognised modality in a visual.
Table 4.3 Mean percentages of visuals in which modality was recognised by low literate and literate respondents

<table>
<thead>
<tr>
<th></th>
<th>Low literates without context</th>
<th>Low literates with context</th>
<th>Literates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recognition of modality in 12 visuals (n=12)</td>
<td>55.1</td>
<td>72.0</td>
<td>64.1</td>
</tr>
</tbody>
</table>

Although the three respondent groups slightly differ in the recognition of modality, low literates from the context score better than the two other groups, a one-way ANOVA does not show significant differences.

In five of the twelve visuals a conventional symbol (cross or tick) was used to show modality; in the other visuals there were no such clues at all. It was expected that visuals with modality signals were more easily recognised as conveying a recommendation than visuals without such signals. Table 4.4 shows the mean percentage of visuals with and without modality signals in which modality was recognised by the three groups of respondents.

Table 4.4 Mean percentage of visuals with and without modality signals in which modality was recognised by low literate and literate respondents

<table>
<thead>
<tr>
<th></th>
<th>Low literates without context</th>
<th>Low literates with context</th>
<th>Literates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visuals with modality signal (n=5)</td>
<td>76.0</td>
<td>84.3</td>
<td>92.3</td>
</tr>
<tr>
<td>Visuals without modality signal (n=7)</td>
<td>40.5</td>
<td>63.3</td>
<td>44.0</td>
</tr>
</tbody>
</table>

In almost all visuals where the modality signal was present literates understood that an advice or discouragement was portrayed and most low literates did too. A two-way ANOVA, with the presence of a modality signal in a visual (with modality signal, without modality signal) as a within-subjects variable and respondent group (low literate without context, low literate with context, literate) as a between-subjects variable shows a main effect of the presence of a modality signal (F=88.30 (1.42), p<.001). Hence, in visuals that contain a modality signal modality is better recognised. There is no significant effect of respondent group (p=.103), yet there is a main effect of presence of a modality signal by respondent group (F=4.16, p<.05). It is striking that in the visuals without modality signal only less than half of the literates
recognises modality, whereas more than 60% of the low literates from the context version interpret the visuals as a recommendation.

4.2.2 Comprehending the intended message of a visual

The percentage of respondents correctly identifying the intended messages of the twelve visuals on HIV/AIDS were analysed for the three tested groups: low literates that did not receive context, low literates that did receive context and literates. Table 4.5 shows the mean percentage of respondents correctly comprehending the intended message of a visual. The complete table with the results per visual is included in appendix F.

<table>
<thead>
<tr>
<th></th>
<th>Low literates without context</th>
<th>Low literates with context</th>
<th>Literates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean percentage of respondents knowing the intended message of a visual (n=12)</td>
<td>30.6</td>
<td>47.7</td>
<td>51.4</td>
</tr>
</tbody>
</table>

A one way analysis of variance (ANOVA) shows that the three respondent groups differ significantly on the comprehension of the intended message of a visual (F(2,38)=6.59, p<.005). Low literate respondents from the context version and literate respondents score significantly higher on the comprehension of the intended messages than low literates that did not receive context (p<.05 and p<.01, respectively). Again no main difference was found between literates and low literates who received context (p=.86).

However, the complete table with the comprehension percentages per visual (see appendix F) shows that there are major differences in comprehension between the individual visuals. This might be due to the different kinds of recommendations that are being conveyed in the visuals and, correspondingly, to which extent visual abstraction has been used. A recommendation to act in a certain way for instance is more abstract and complicated than a recommendation to refrain from unsafe behaviour, since the latter advice can be represented more easily using gestures or modality signals. The effect of the kind of recommendation being conveyed in a visual on comprehension of the intended message by low literate and literate viewers is shown in table 4.6.
Table 4.6 Mean percentage of four types of recommendations correctly comprehended by low literate and literate respondents

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Low literates</th>
<th>Low literates</th>
<th>Literates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>without context</td>
<td>with context</td>
<td></td>
</tr>
<tr>
<td>Recommendation to communicate about HIV</td>
<td>12.5</td>
<td>23.1</td>
<td>28.8</td>
</tr>
<tr>
<td>(n=4)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recommendation to refrain from unsafe behaviour</td>
<td>35.1</td>
<td>43.6</td>
<td>69.4</td>
</tr>
<tr>
<td>(n=3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recommendation to go for VCT (n=1)</td>
<td>0</td>
<td>28.6</td>
<td>7.7</td>
</tr>
<tr>
<td>Recommendation to live healthy (n=4)</td>
<td>56.6</td>
<td>75.0</td>
<td>73.1</td>
</tr>
</tbody>
</table>

The kind of recommendation conveyed in a visual indeed seems to have an influence on how well that recommendation is comprehended by low literate and literate South Africans. Recommendations to live healthy are quite well understood, probably because they can be easily represented using humans or analogical objects and a well-understood modality signal. Recommendations to go for VCT and to communicate about HIV are poorly comprehended. This might be due to the need of many kinds of visual abstraction to convey these recommendations. However, the n-values of the four types of recommendations are too small to test the effects of the kind of recommendation statistically.
5. Conclusion and discussion

In the previous chapter the results from the questionnaires have been discussed. In section 5.1 these results will be analysed, leading to accepting or rejecting the hypotheses. These conclusions will provide an answer to the question what the effect of visual abstraction in visuals on HIV/AIDS is on the comprehension of the intended message by low literate and literate South Africans. Possible explanations of these results will be discussed in section 5.2. I will conclude with recommendations for document designers of health documents on HIV/AIDS in section 5.3.

5.1 Conclusion

In general it can be said that visual abstraction has a negative effect on the comprehension of the intended message of visuals on HIV/AIDS by low literate and literate South Africans. However, this effect is much more visible for low literates than for literate viewers of these visuals.

5.1.1 The effect of literacy on the recognition and comprehension of concrete and abstract visual elements

The results discussed in this section lead to a partially acceptation of hypothesis H1a; in general the proportion of recognised visual elements indeed decreases as the elements are less familiar and less related to their own bodily experiences. As expected, humans were best identified by all groups of respondents, followed by the analogical objects. Conventional symbols were more problematic to comprehend, but against expectations they were more often correctly interpreted than the bodily elements. The visual element that was worst comprehended was the metaphor. However, there was only one example of a metaphor in this research, so further research is necessary to study the comprehension of metaphors in general. Metonymy was expected to be the most problematic form of visual abstraction, yet it was well comprehended by literate respondents and relatively well by low literates.
Hypothesis H1b can also be partially confirmed. The difference in recognition and comprehension between literates and low literates is bigger for abstract visual elements than for concrete visual elements. However, meaningful bodily elements form an exception. Although they are an example of concrete and embodied representation, low literates score remarkably low on the comprehension of these bodily elements as opposed to literate respondents.

As expected low literate South Africans do not recognise and comprehend visual abstraction as well as literate South Africans. Most problematic abstract elements in visuals on HIV/AIDS for low literates are conventional symbols and metaphors and it is for these degrees of visual abstraction that the differences with literate respondents are the biggest. The main reason for this is likely to be the conventional meaning of these elements. Differences in recognition and comprehension of different kinds of conventional symbols support this idea. The crosses and tick for instance were well comprehended by almost all low literates, resulting in comprehension scores close to the scores of literate respondents. Thought and speech balloons on the other hand were generally poor understood by low literates, especially in comparison to the results from the literates. A possible explanation can be the fact that crosses and ticks are frequently used in instructional health documents, which are aimed at all people, including low literates, whereas thought and speech balloons are more common in comic books which are more likely to be read by literate people. This would thus support the idea that more exposure to conventional symbols leads to a better comprehension, as was proposed in the theoretical framework.

Hypothesis H1c dealt with the effect of provided context on the comprehension of visual abstraction by low literate respondents. This hypothesis can be confirmed. The difference between low literates who did not receive context and low literates who did receive context generally increased as the objects were less concrete and embodied. Both low literate groups recognised concrete elements equally well, whereas the group that received a framework scored better (although not significantly) on the recognition of conventional symbols and metonymy.

5.1.2 The effect of literacy and provided context on comprehension of the intended message
Literate respondents and low literate respondents from the context version were significantly better able to comprehend the intended messages of the twelve visuals than low literate respondents who did not receive context. Although literates also scored better than low literates who did receive context, there was no significant difference here. This shows that both literacy level and provided context have an influence on the ability of low literates to comprehend the intended message of a visual, supporting hypotheses H2a and H2b.

An important factor in the comprehension of the intended message of a visual was the recognition of modality. Modality was recognised more often than expected, largely because of the use of modality signals in almost half of the visuals. As observed previously crosses and the tick were well comprehended and proved to be an effective means of representing modality in visuals. In the visuals without such modality signals not many respondents recognised their instructional intend. These visuals were more likely to be interpreted as epistemic situations, e.g. as something that is, as opposed to something that should be (Carstens et. al, 2006: 222).

The influence of provided context also shows in the results on the recognition of modality in modal visuals. It is striking that in the visuals without modality signal only less than half of the literates recognises modality, whereas more than sixty percent of the low literates from the context version interpret the visuals as a recommendation. A reasonable explanation is that the extra information provided to half of the low literate participants lead them to recognise the instructional intend. This could also account for the observation that low literates who did receive context were more likely to recognise a recommendation in the visuals without modality signals than the respondents who did not receive contextual information.

It was also tested whether the kind of recommendation conveyed in a visual was of influence on the ability to comprehend the intended message. There were huge differences between the four kinds of recommendations and they seemed rather consistent for the three respondent groups. Visuals that provide a recommendation to live healthy were quite well comprehended, whereas visuals that advise people to go for VCT or to communicate about HIV prevention were poorly understood. However, there were not enough examples of every kind of recommendation to study main effects.

We have now seen that literacy and provided context are of influence on the recognition and comprehension of visual abstraction and on the comprehension of the intended message of a
visual. It was also expected that both of these abilities are related. The results on their relationship are discussed next.

5.1.1 The effect of visual abstraction on comprehension of the intended message of modal HIV/AIDS visuals

Hypothesis H3a proposed that it will be more difficult for low literates and literates to comprehend the intended message of a visual as the level of visual abstraction increases. The results show that this hypothesis can be accepted. The visuals that were worst comprehended were the ones containing a combination of the degrees of abstraction that proved to be quite difficult to understand, namely conventional symbols, metonymy and in one case a metaphor. The analysis of the visuals in appendix B showed that all of these forms of visual abstraction convey information that is essential to arrive at the intended message. If one symbol or example of metonymy is not comprehended it becomes almost impossible to comprehend the correct meaning of the visual and this is exactly what the results show.

The results further show that the more kinds of visual abstraction are present in a visual the more difficult it becomes to interpret the visual correctly. In these visuals it is not only necessary to recognise and understand all elements individually, but their meanings have to be combined to arrive at the intended message. That is where many problems occur. All respondents, low literates as well as literates, tend to focus on one or two visual elements. They often notice the other elements as well, but neglect to include them in the intended message. This observation can be illustrated using Visual 2. In this visual a boy and a father can be seen. There is a speech balloon with a condom inside, pointing towards the male adult. Almost all respondents recognise the humans, the condom and many recognise that the father is talking. When asked to verbalise the intended message most respondents focus on the fact that people should use condoms when they get intimate. The observation that the father is talking to his son, which is essential for the message that fathers should give sexual information to their kids, is not mentioned. In contrast, the visuals with fewer different visual elements were comprehended better. Since all twelve visuals vary enormously in the kind of concrete and abstract visual elements they contain and in the effect these degrees of visual abstraction have on the comprehension of the intended message, a qualitative analysis per visual is given in appendix E.
Hypothesis H3b proposed that the difference in recognising the correct intended meaning of a visual between low literates and literates will increase as the level of visual abstraction increases. The (partially) acceptance of hypotheses H1a, H1b and H3a automatically leads to information in favour of hypothesis H3b. If visual abstraction increases it becomes more difficult for a viewer to comprehend the intended message of a visual, but relatively more so for low literates than for literates since they have more difficulty with comprehending visual abstraction than literate viewers. However, the results do not support this hypothesis. Visual 8 for instance is a very complicated visual, because it tries to convey a very abstract message using two conventional symbols, a metaphor and different meaningful bodily elements (see the analysis of Visual 8 in appendix B). According to the expectations low literate respondents should have more difficulty with comprehending the intended message of this visual, yet the high level of visual abstraction did not result in a difference in comprehension between literates and low literates. The analysis of Visual 1 showed that this visual was quite complicated as well and here interesting differences between low literates and literates were found. The opposite is observed too. Although Visuals 9 and 10 are quite similar and no interesting differences between low literates and literates are found in the comprehension of Visual 10, there is a big difference in the comprehension of Visual 9.

It indeed seems to be that although literacy is of influence on the comprehension of various visual elements and on the comprehension of the intended message of a visual; this does not automatically mean that the difference in recognising the correct intended meaning of a visual between low literates and literates will increase as the level of visual abstraction increases. Individual aspects of a visual are likely to be of influence here as well. The qualitative analyses in appendix E provide more information on the differences between the twelve visuals.

Hypothesis H3c proposed that the difference in recognising the correct intended meaning of a visual between low literates that did receive context and low literates that did not will increase as the level of visual abstraction increases. This hypothesis can be accepted on the basis of most results. In general the most abstract visuals show the biggest differences in comprehension between low literate respondents who did not receive context and those who did. However, there are again visuals that contain a number of abstract elements but show no differences in comprehension between the two groups of low literates.
5.2 Discussion

5.2.1 Remarkable results

Most results are in line with previous research (Carstens et. al, 2006 in particular) and with the expectations that were described in the theoretical framework and in appendix B. A few results are remarkable, however. The meaningful bodily elements were expected to be well comprehended for instance, yet they were not. Many bodily elements that were poorly recognised concerned elements that were not clearly present, such as the big belly of the pregnant woman in Visual 8, or the open mouth of the woman in Visual 4. Other visuals show that if such a bodily element is clearly visible it is much better recognised (compare the open mouth of the father in Visual 2 or the bleeding knee of the child in Visual 7).

Especially the bodily elements that function as implicit signals to suggest something is going to happen or has just happened in Visuals 5 and 6 were poorly recognised. Sometimes these signals were interpreted the wrong way and sometimes they were completely overlooked. The qualitative analyses of Visuals 5 and 6 deal more extensively with the comprehension of these meaningful bodily elements.

Another interesting observation is that modality was rather poorly recognised. Only when a visual contained a modality signal most respondents recognised that a recommendation was being conveyed. The nature of the context that was provided to half of the low literates was probably the only reason why that group recognised modality in visuals without a modality signal relatively well.

5.2.2 The effect of providing context to low literate respondents

The effect of provided context on the results of low literate respondents was tested to find out whether differences in results between literates and low literates are more dramatic if no framework would be provided to low literates and to investigate whether data from literates and low literates can be compared if both groups do not receive context. The results show that providing context indeed influences the results of the low literate respondents. Especially
conventional symbols and modality are better (although not significantly) identified and comprehended when context is provided,

This research also aimed at studying the effect of providing a framework to low literate respondents. The main reason why this was done in Carstens (2004b), Carstens et. al (2006) as well as in this study, was the expectation that low literates had less general knowledge about preventing and living with HIV than literates. However, in their discussion Carstens et. al (2006: 229) proposed that it might have had an influence on their results. The results of this study indeed show that providing context to low literates influences their results. Low literates from the context version score better (although not always significantly) on the recognition and comprehension of various conventional symbols, the metaphor, metonymy and modality than low literates who did not receive a framework, resulting in the expected and significant difference between the two groups of low literates in the comprehension of the intended message of the visuals. As Carstens et. al (2006) expected not providing a framework to low literates resulted in more dramatic differences between low literate and literate respondents, especially with regard to most difficult forms of visual abstraction. However, a qualitative analysis shows that the rationale of Carstens et. al (2006) to provide a framework to low literates is not valid. Differences between low literates and literates mainly concern the recognition and comprehension of different degrees of visual abstraction. Low literates’ lower ability to recognise the intended message of a visual can be directly derived from their interpretation problems. In general they verbalise well-known recommendations regarding preventing and living with HIV very easily. Moreover, they comprehended visual abstraction and the visuals in general well enough to provide useful data, comparable to that of the literate participants. Providing context thus unnecessarily influences results from low literates. It decreases the differences between low educated and well educated South Africans, resulting in less reliable conclusions.

5.2.3 Validity of the results

Although the three groups of respondents were quite small interesting results were found. All visual elements that were studied were explicitly questioned in this research, whereas in previous research by Carstens (2004b) and Carstens et. al (2006) more general questions were asked. Additionally, whereas low literates in Carstens (2004b) and Carstens et. al (2006) were
interviewed in English or Afrikaans, low literates in this study were interviewed in their first language. They were therefore better able to express themselves. These method adaptations lead to more meaningful data. Moreover, the collected data was not only suitable for a qualitative analysis, but for a quantitative analysis as well. Most findings by Carstens (2004b) and Carstens et. al (2006) could thus be supported more firmly, whereas others were disproved.

5.2.4 Limitations and recommendations for future research

This research project is a follow-up on the studies of Carstens (2004b) and Carstens et. al (2006) and largely aimed at replicating parts of those studies to make up for some limitations in their design. Many possible limitations in this study were therefore tackled in an early stage. Still there are aspects that were not taken into consideration in this research but that might have had an influence on the results.

An interesting factor in the processing and understanding of modal visuals on HIV/AIDS is the degree to which viewers are interested in and familiar with the topic and motivated to learn from the visuals. It is for instance likely that people who know they are HIV infected process these visuals differently from people who are not directly concerned with HIV/AIDS. Moreover, they might be more likely to relate the message that is conveyed to their own situation, instead of interpreting it as an epistemic situation. For future research it is advised to include some questions about the experience of respondents with HIV/AIDS information, e.g. whether they have read brochures, participated in HIV/AIDS related workshops, have learned from other people etc. In this research during some interviews it became clear that some low literates had participated in a workshop concerning HIV/AIDS earlier. This might have caused some of the respondents to know more about the subject than others. Their answers might therefore not always be representative for other low literate respondents. This effect of experience with HIV/AIDS and information on HIV/AIDS could be ruled out in future research.

Furthermore, the low literate respondents from this study all lived in the township Atteridgeville, near Pretoria. This is an urban area where people generally are often exposed to visuals, e.g. on billboards, in shops or in community centres. In this research the influence of exposure on comprehension of visual elements and visuals in general became clear once again.
It is therefore expected that low literate people in rural areas experience more problems with the recognition and comprehension of visual abstraction. Future research might be needed to study differences between low literates from rural and urban areas.

This research showed that a recommendation is more easily recognised in a visual when a modality signal is used. However, only the effect of crosses and a tick is studied. Although they have proven to be very effective in this study, this might not be the case for people who are less familiar with these signs. It could therefore be interesting to study other ways to convey modality, for example using the depiction of a gesture representing right or wrong. This research made clear that bodily elements and familiar gestures are generally well understood so it would be interesting to study their use as a modality signal. Furthermore, in this research there was only one visual containing a tick. It was very well comprehended, but the combination with the cross in the almost similar visual before might have helped the respondents. It is advised to further study the comprehension of this symbol separately from a cross.

The effect of provided context was tested through giving one group of low literates extra information in the form of one sentence. However, a number of times the interpreter forgot to read this sentence to a respondent. During three interviews she forgot to read it with more than half of the visuals. These three respondents were therefore analysed with the group of respondents that did not receive context. In the context version there are thus a few respondents who missed the extra information with a few visuals. Except for one or two times it always concerned a visual with the same extra information that was provided with the visual before, but still it might have biased some of the results. For all further research it is advised not to provide extra information to low literates if it is not provided to literates. This research has shown that it influences the results from low literates unnecessarily.

### 5.3 Recommendations for health document designers

The introduction of this report showed the importance of health documents on HIV/AIDS in South Africa and the power that visuals can have to make the information they spread more comprehensible, if those visuals are comprehended. The results from this study on the effect of
visual abstraction on the comprehension of modal visuals can therefore be interesting for designers of health documents.

Carstens et. al (2006) propose that all health education materials should be aimed at low literate viewers. Documents that require a higher reading level are too difficult to comprehend for low literates, but high-level readers do not have problems with short, simple and colourful education materials. A study conducted by the National Work Group on Literacy and Health (NWGLH, 1998; in Carstens et. al (2006: 229) even showed that high-level readers preferred these shorter and simpler pamphlets. No one was offended by its simplicity. All suggestions for the use of visuals in future health documents are therefore based on the experiences of low literate South Africans with the twelve visuals on HIV/AIDS in this research in combination with the theory provided in the theoretical framework.

Concrete visual elements have proved to be well comprehended. Humans, analogical objects and bodily elements are easy to identify and their meaning is easily recognised because of the familiarity with a viewers own bodily experiences. Their effectiveness should be exploited in modal visuals.

Modality signals turned out to be expressive signs to show a recommendation is being conveyed. In this research only the effectiveness of the cross and tick as modality signals was tested, but they were well comprehended, especially when combined. Crosses are quite often used to represent a warning or discouragement in modal visuals in health documents. If the intended message of a visual is a positive recommendation, e.g. an advice, then modality signals are only rarely used. Document designers should take more advantage of the positive effect of modality signals. In all visuals displaying an advice a tick should be depicted and in all visuals displaying discouragement a cross should be present.

Most thought and speech balloons in the research material were poorly understood by low literate participants. Speech is more easily derived from bodily elements, such as an open mouth, than from a conventional symbol. Designers should thus make sure that abstract messages can be derived from bodily elements as much as possible and not only rely on abstract representation.
The general recommendation to document designers is thus that instructional visuals should be as simple and concrete as possible. However, this is not always possible, especially when rather abstract messages need to be conveyed. It is therefore extremely important that low literates learn how to interpret visual abstraction and abstract modal visuals (see also Linney, 1995:31). Many theories and the results from this study suggest that more exposure to visuals lead to a better comprehension of conventions often used in these visuals. Health workers, local and governmental authorities should all assist in making sure that low literate target groups will be more exposed to visual health information. Moreover, through workshops and other personal initiatives low literates can be taught how to deal with visual information. This way they will learn the conventions used in health documents and hopefully learn from the important information they provide.
Resource list

Literature


Websites

http://www.avert.org/his81_86.htm
http://www.csa.za.org/
http://www.epidasa.org
http://www.sanpad.org.za/
http://www.soulcity.org.za/01.01.asp

All websites were visited between October 2005 and November 2006.
Appendix A – Material

Visual 1

Edwards (2000; in Carstens, 2004b)

Visual 2

Edwards (2000, in Carstens, 2004b)

Visual 3

Edwards (2000, in Carstens 2004b)

Visual 4

National AIDS Programme, n.d.
Soul City: AIDS in our community (1996)


National AIDS programme, n.d.
Appendix B – Analysis of material

Visual 1

What can be seen?
In this picture a woman and a girl, presumably a mother and her daughter, can be seen. Above the girl’s head is a cloud with a picture of a man, a woman, a baby and two signs inside. Between the cloud and the girl’s head are two small clouds.

What is the intended meaning?
Mothers should give their daughters sexual information.

How can the intended meaning be deduced?
- The mouth of the mother is open and her arm is gesturing, indicating that she is explaining something;
- The picture of the family and the two signs are in a thought balloon, which shows that it is what the girl is thinking;
- It can be assumed that the girl is thinking about what the mother is telling;
- The signs in the thought balloon mean plus and equals to, resulting in: a man plus a woman equals to a baby. This is basic sexual information;
- The red ribbon indicates that the picture is about HIV/AIDS, so we can assume that a lesson can be learned;
- Giving sexual information to girls is important to fight the spread of the HIV virus;
- Thus mothers should give sexual information to their daughters.

Possible difficulties for low literates

Abstract elements to be understood:
The signs + and = and the thought balloon.

Bodily elements
The open mouth of the woman and her arm gesture show us that she is explaining. The mouth of the girl is open too, however, and can cause miscomprehension.
Metonymy
The picture of the family represents sexual information.

Recognising modality
The visual expresses an advice and the advice should be related to HIV/AIDS.

Visual 2

What can be seen?
In this picture we see a boy and a man, probably a son and his father. The father has put his hand on the boy’s shoulder and his mouth is open. There is a balloon shape on top of the boy’s head with a picture of a condom inside.

What is the intended meaning?
Fathers should give their sons sexual information.

How can the intended meaning be deduced?
- The mouth of the father is open and the speech balloon is pointing to his mouth, both indicating that he is talking;
- Inside the speech balloon is a condom, so the father is talking about a condom;
- The condom represents protection or safe sex in general, so we can assume that the father is giving sexual information;
- The red ribbon indicates that the picture is about HIV/AIDS, so we can assume that a lesson can be learned;
- Giving sexual information to boys is important to fight the spreading of the HIV virus;
- Thus fathers should give sexual information to their sons.

Possible difficulties for low literates

Abstract elements to be understood
- The speech balloon.

Bodily elements
- The open mouth indicates that the father is talking.
Metonymy
The condom represents sexual information.

Recognising modality
The visual expresses an advice and the advice should be related to HIV/AIDS.

Visual 3

What can be seen?
A boy has wrapped his arm around a girl; they both look happy. On the right is a cloud. Inside is the picture of two people in a bed and clothes on the floor. Through the picture a cross is drawn. Between the cloud and the heads of the boy and the girl are small clouds.

What is the intended meaning?
Young couples should postpone sexual debut.

How can the intended meaning be deduced?
- The boy is wrapping his arm around the girl and the two are close and smiling to each other, indicating that they are a couple;
- There is a thought balloon with small ‘clouds’ leading to the heads of both the boy and the girl, which means that they are thinking the same thing;
- The picture in the thought balloon shows a two people in a bed and clothes on the floor; these signs are an indexical representation of sex (Carstens, 2004b);
- The cross through the picture means that what is happening in that picture is wrong;
- Thus, the couple is thinking that sex is wrong;
- The red ribbon indicates that the picture is about HIV/AIDS, so we can assume that a lesson about HIV/AIDS can be learned;
- According to this information, the meaning of the picture would be that couples should not have sex;
- The fact that the couple looks young and the text on the shirt of the boy lead to the interpretation that these people are too young and should wait with having sex;
- The red ribbon indicates that this is an advice in order to prevent yourself from spreading or getting infected with HIV.
Possible difficulties for low literates

Abstract elements to be understood
The cross, the thought balloon and the text on the boy’s shirt.

Bodily elements
The boy and girl are a couple, their postures and the boy’s arm wrapped around the girl show this.

Metonymy
The bed and the clothes on the floor represent sexual intercourse.

Recognising modality
The visual expresses an advice and the advice has to be related to HIV/AIDS.

Visual 4

What can be seen?
In this visual a man is embracing a woman. On top of the woman is a balloon-like shape with a protrusion that points towards the woman. Inside is the picture of a condom. There are red hearts surrounding the man.

What is the intended meaning?
Young couples should negotiate the use of a condom before having sex.

How can the intended meaning be deduced?
- The red hearts mean love;
- The hearts are only surrounding the man; they represent an emotion and show that he is in love with the woman. It might even mean that he wants to make love to the woman;
- The man and the woman are close together; the man is embracing the woman and the woman seems find with that, all indicating that they are a couple;
- The mouth of the woman is open, her head is turned to the man and there is a speech balloon with a protrusion pointing towards her, indicating that she is talking to the man;
In the speech balloon is a condom, which shows that the woman is talking about a condom;

Taking all this together, we can assume that the woman brings up the subject of condoms, because the man wants to have sex with her;

The red ribbon shows that this picture is about HIV/AIDS, so we can assume that a lesson on this topic can be learned;

Using a condom can prevent you from getting infected or infect someone else with HIV;

The fact that it is the woman who is talking about the condom adds to the meaning of this picture that woman can talk about it and that they should if they are about to have sex.

**Possible difficulties for low literates**

*Abstract elements to be understood*

The hearts that represent love and the speech balloon.

*Metonymy*

In this picture, the biggest inference that has to be made is that the man loving the woman actually means that he wants to have sex with the woman and, accordingly, that this couple is about to have sex.

*Recognising modality*

The visual expresses an advice and the advice is about HIV/AIDS prevention.

**Visual 5**

**What can be seen?**

In this picture there are two boys with bare upper bodies. The right boy is holding a razor blade in his left hand and he seems to reach it out to the other boy. With his right hand he touches his cheek. The left boy, who has a little beard grow, is reaching out his hand towards the razor blade. There is a red cross drawn through the hands of the boys and the razor blade.

**What is the intended meaning?**
Do not share razor blades.

**How can the intended meaning be deduced?**

- The right boy has a shaving machine in his hand and a painful cheek. From this we can deduced that he just shaved and cut himself;
- The left boy reaches out his hand towards the razor blade in the hand of the left boy, indicating that he wants the razor blade;
- The left boy has a little beard growth; indicating that he needs to shave himself;
- The cross trough the hands means that what is happening here is wrong;
- The red ribbon shows that this picture is about HIV/AIDS;
- So sharing razor blades is wrong, especially if the users have small cuts, because HIV can be transmitted this way.

**Possible difficulties for low literates**

*Abstract elements to be understood*

The red cross.

*Bodily elements*

The hand of the right boy indicates that he has hurt himself (i.e. just shaved himself) and the left hands of both boys show that they want to exchange the razor. The beard growth of the left boy indicates that he wants to shave himself.

*Recognising modality*

The visual expresses a discouragement and this is on HIV/AIDS prevention.

**Visual 6**

Two boys are sitting on a couch. The left boy has a bandage on his right arm and an injection in his left hand. The right boy reaches out his hand towards the left boy; the sleeve of his shirt is tucked up. There is a black cross through the picture.

**What is the intended meaning?**
Do not share needles.

**How can the intended meaning be deduced?**
- The left boy wants to inject himself;
- The right boy stretches out his hand towards the injection in the hand of the left boy, indicating that he wants the needle;
- The right boy has tucked up one sleeve; indicating that he wants the injection to inject himself;
- The cross through the picture means that what is happening here is wrong;
- The red ribbon shows that this picture is about HIV/AIDS;
- So sharing needles is wrong, because HIV can be transmitted this way.

**Possible difficulties for low literates**

*Abstract elements to be understood*
The black cross.

*Bodily elements*
The entire posture of the boy on the left and the bandage around his arm indicate that he wants to inject himself and the gesture of the right boy shows that he wants the injection. The right boy also has tucked up his sleeve, indicating that he is planning to inject himself too.

*Recognising modality*
The visual expresses a discouragement and this is on HIV/AIDS prevention.

**Visual 7**

![Image of a girl and a woman sitting on the ground, with a bleeding girl and three kids in the background]

**What can be seen?**
In the foreground we can see a girl and a woman sitting on the ground. The woman is holding the girl, who is bleeding on her knee. In the background there are three kids; they are looking at the woman and the girl. The woman is holding up her right hand, with her hand palm towards the kids. Her face is turned towards them as well.

**What is the intended meaning?**
Do not touch somebody else’s blood. Be careful around someone who is bleeding and keep children away.

**How can the intended meaning be deduced?**

- The girl in the front is bleeding;
- The woman is signing to the children in the background;
- The red ribbon suggest that this picture is about HIV/AIDS;
- You can get infected with HIV through blood contact;
- To avoid infecting someone or to get infected: avoid blood contact;
- Be careful around someone who is bleeding;
- Keep children away from someone who is bleeding.

**Possible difficulties for low literates**

*Bodily elements*

The woman’s signalling can be interpreted in two ways (as a stop sign or as a signal for help).

*Recognising modality*

The visual wants to express a recommendation on HIV/AIDS prevention.

**Visual 8**

*What can be seen?*

A man is holding a pregnant woman. They look worried. On top of their heads is a cloud like shape; inside are a red monster and a question mark. Between the cloud and the heads of the man and woman small clouds can be seen.

*What is the intended meaning?*

Go for VCT (have an AIDS test) if you don’t know your status, especially when you are pregnant. Your child could have HIV.
How can the intended meaning be deduced?

- The big belly and her hands covering her belly show that the woman is pregnant;
- The man holding the woman and the two of them standing close together indicate that they are a couple;
- Their facial expressions show that there is a problem; they are worried about something;
- The cloud like shape on top of their head means that they are thinking;
- The red monster represents a virus, in this case HIV;
- The question mark in combination with the virus stands for questioning your status, wondering if you have the virus;
- Thus the man and the woman are worried because they do not know whether they have HIV or not;
- Since the woman is pregnant an infected woman can infect her unborn child, they are also worried that their baby might have HIV;
- Their doubt and worries can be taken away by having an AIDS test.

Possible difficulties for low literates

Conventional symbols
The question mark and the thought balloon.

Metaphor
The monster represents HIV or AIDS.

Bodily elements
The man and the woman are a couple, the woman is pregnant and they look worried.

Recognising modality
The visual expresses an advice and the advice has to be related to HIV/AIDS.

Visual 9

What can be seen?
This picture shows a white bread and a can of soda. In the background a big red cross is depicted.
What is the intended meaning?
Do not consume unhealthy food and drinks if you have HIV or AIDS.

How can the intended meaning be deduced?
- A cross means ‘wrong’, ‘prohibition’ or ‘danger’;
- The big cross is just behind the bread and soda;
- Therefore the meaning of the cross is being projected on the food and drink, indicating that white bread and soda are not good or unhealthy;
- The bread and drink in this picture represent unhealthy food in general;
- The red ribbon suggests that the picture is about HIV/AIDS;
- Thus the visual means that if you are infected, you should not consume this kind of food.

Possible difficulties for low literates

Conventional symbols
The red cross.

Metonymy
The depicted products represent unhealthy food in general.

Recognising modality
The visual expresses a discouragement and this has to be related to HIV/AIDS.

Visual 10

What can be seen?
In this picture a brown bread, one and a half orange and cheese are depicted. Behind the food a big green V sign is depicted.

What is the intended meaning?
Consume healthy food if you have HIV or AIDS.

How can the intended meaning be deduced?
- The V sign or tick means ‘right’, ‘good’ or ‘safe’;
– The tick is just behind the depicted food;
– Therefore the meaning of the tick is being projected on the food, indicating that brown bread, oranges and cheese are good or healthy;
– The three products in this picture represent healthy food in general;
– The red ribbon suggests that the picture is about HIV/AIDS;
– Thus the visual means that you should consume this kind of food if you are infected.

**Possible difficulties for low literates**

*Conventional symbols*

The green tick.

*Metonymy*

The depicted products represent healthy food in general.

*Recognising modality*

The visual expresses an advice and this has to be related to HIV/AIDS.

**Visual 11**

![Picture of a man kicking a ball](image)

**What can be seen?**

In the picture a man is kicking a ball high in the air with his right foot. He is playing on grass and he smiles.

**What is the intended meaning?**

Exercise regularly if you have HIV or AIDS

**How can the intended meaning be deduced?**

– The man is playing soccer;
– Playing soccer represents playing sports or exercising in general;
– The red ribbon suggests that the picture is about HIV/AIDS;
– Therefore the meaning of the picture has to be linked to having HIV or AIDS;
– Thus, we can assume that the man in this picture has HIV or AIDS.
– People who have HIV or AIDS should exercise regularly.
Possible difficulties for low literates

Metonymy
Playing football represents sporting or exercising in general.

Recognising modality
The visual expresses an advice and this has to be related to HIV/AIDS.

Visual 12

What can be seen?
A coloured woman is sitting in an armchair reading a book. She is not wearing shoes and has her feet on a foot-rest. She seems very relaxed.

What is the intended meaning?
Relax regularly if you have HIV or AIDS.

How can the intended meaning be deduced?
- The woman has a contented expression on her face, is not wearing shoes and has her legs on a foot-rest and is reading a book;
- These signs indicate that the woman is relaxing;
- The red ribbon indicates that the picture is about HIV/AIDS;
- We can assume the woman has HIV or AIDS;
- People who have HIV or AIDS should take time to relax.

Possible difficulties for low literate people

Metonymy
Sitting and reading a book represents relaxing in general.

Recognising modality
The visual expresses an advice and this has to be related to HIV/AIDS.
Appendix C – Introduction of questionnaire

Introduction of questionnaire for interviews

Hello,
Thank you for helping us.
This interview will be recorded on video, are you ok with that? I will ask you some questions about some pictures. I like to know what you think of them. You cannot give wrong answers; I just want to know your opinion.

Do you have any questions? Can we start?

All the pictures that I am going to show you are from information brochures on health communication. They are all about HIV/AIDS. You can see that because the red ribbon is on all of them.

Introduction of printed questionnaire

Hello,
My name is Karen Foesenek and I am a Dutch student at Tilburg University in the Netherlands. For my master’s degree I am doing research about pictures that are used in South African public information documents on HIV/AIDS. This research is supervised by Prof. Dr. A. Carstens (University of Pretoria) and Prof. Dr. A. Maes (Tilburg University).

I have 12 pictures that I would like you to look at. They are all about HIV/AIDS (see the red ribbon). Each picture appears on a new page. Will you please be so kind to answer the questions about them? You will find them under each picture. You can type your answers in the rectangles, directly under the questions. Some questions are about a specific part of the picture. To make this clear, that part of the picture is reproduced left of the question.
This questionnaire will take about 20 minutes to complete. Will you be so kind to answer all the questions, even if you think you have already given the answer in a previous question, and start with the personal information below?

If you are ready, you can save the document and send it to me by e-mail.

Thank you in advance!
Appendix D – Questionnaires

Questionnaire for interviews

Visual 1

1. What do you see in this picture? (Just give the picture, don’t point. Give respondent enough time to answer)
2. What do you see here? (Point to big picture, only if participant hasn’t talked about it yet)
3. What do you see here? (Point to small picture in cloud, only if participant hasn’t talked about it yet)
4. What do these things mean? (Point to + and = signs, only if they haven’t been named already).
5. Why is this picture in this cloud-like shape? (Point to the picture in the cloud)
6. What do you think the picture wants to tell you?

Visual 2

1. What do you see in this picture? (Just give the picture, don’t point. Give respondent enough time to answer)
2. What do you see here? (Point at big picture, only if participant hasn’t talked about it yet)
3. What do you see here? (Point at small picture, only if participant hasn’t talked about it yet)
4. Why is this picture in this round shape with the tail? (Point to the picture in the balloon)
5. What do you think the picture wants to tell you?

Visual 3

1. What do you see in this picture? (Just give the picture, don’t point. Give respondent enough time to answer)
2. What do you see here? (Point to big picture, only if participant hasn’t talked about it yet)
3. What do you see here? (Point to small picture in cloud, only if participant hasn’t talked about it yet)
4. What does this mean? (Point at the cross, only if participant hasn’t said that yet)
5. Why is this picture in this cloud-like shape? (Point to the picture in the cloud)
6. What do you think this picture wants to tell you?

Visual 4

1. What do you see in this picture? (Just give the picture, don’t point. Give respondent enough time to answer)
2. What do you see here? (Point to the boy and girl, only if participant did not talk about it)
3. What do you see here? (Point to the picture in the balloon, only if participant hasn’t talked about it yet)
4. Why is this picture in this round shape with the tail?
5. What are these red things? (Point at hearts, only if they haven’t named them yet)
6. What do they mean? (only if respondent said ‘hearts’ as answer to the previous question and if he/she didn’t say what they mean)
7. What do you think this picture wants to tell you?

Visual 5

1. What do you see in this picture?
2. What has the boy in his hand? (only if it hasn’t been named yet)
3. What does this boy (Point at left boy) want?
4. What does this mean? (Point at the cross, only if it hasn’t been named yet)
5. What do you think this picture wants to tell you?

Visual 6

1. What do you see in this picture?
2. What has this boy in his hand? (Point at left boy, only if it hasn’t been named yet)
3. What does this boy (Point at right boy) want?
4. What does this mean? (Point at the cross, only if it hasn’t been named yet)
5. What do you think this picture wants to tell you?

Visual 7
1. **What do you see in this picture?** (Just give the picture, don’t point. Give respondent enough time to answer)
2. **What do you see here?** (Point to the woman and the girl, only if participant hasn’t talked about them yet)
3. **What do you see here?** (Point to the children in the background, only if participant hasn’t talked about them yet)
4. **What’s up with the girl?** (Only if the respondent hasn’t said anything about that yet)
5. **What is the woman doing?**
6. **Why is the woman doing that?** (Only if respondent gave an answer to the previous question)
7. **What do you think this picture wants to tell you?**

**Visual 8**

1. **What do you see in this picture?**
2. **How do these people look?** (If respondent hasn’t said anything about their emotion yet)
3. **How do they feel?** (Only if respondent still hasn’t said anything about their emotion)
4. **What do you see here?** (Point to pictures in cloud)
5. **What does this mean?** (Point at the red monster, only if respondent hasn’t said anything about it yet)
6. **What does this mean?** (Point at question mark, only if respondent hasn’t said anything about it yet)
7. **Why are these pictures in a cloud-like shape?** (Point to the pictures in the cloud)
8. **What do you think this picture wants to tell you?**

**Visual 9**

1. **What do you see in this picture?**
2. **What kinds of food/drinks?** (If respondent only said: food/drinks)
3. **What in the picture shows you that?** (If respondent says anything like ‘unhealthy, wrong, bad etc.)
4. **What does this red thing means?** (Point to the cross, only if the respondent gave a wrong answer/ didn’t say anything like wrong, unhealthy etc.)
5. What do you think the picture wants to tell you?

Visual 10

1. What do you see in the picture?
2. What kinds of food/drinks? (If respondent only said: food/drinks)
3. What in the picture shows you that? (If respondent says anything like healthy, good etc.)
4. What does this green thing mean? (Point to the tick, only if respondent gave a wrong answer/ didn’t say anything like good, healthy etc.)
5. What do you think the picture want to tell you?

Visual 11

1. What do you see in this picture?
2. What is the man doing? (Only if respondent didn’t say anything about what the man is doing)
3. What do you think the picture wants to tell you?

Visual 12

1. What do you see in this picture?
2. What is the woman doing? (Only if respondent didn’t say anything about what the woman is doing)
3. What do you think the picture wants to tell you?

That was the last question. Thank you very much for helping us.
Can I ask you some last questions?

Have you seen this kind of pictures before?
If yes: where?
How old are you, or when were you born?
How many years did you go to school, or up until what standard?
Do you have a job? What kind of work do you do?
**Printed questionnaire**

**Personal information**

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<th>Native language:</th>
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<tr>
<td>Occupation:</td>
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<td>Years of formal education:</td>
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**Picture 1**

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<th>What do you see in this part of Picture 1?</th>
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<tbody>
<tr>
<td>What do you see in this part of Picture 1?</td>
<td></td>
</tr>
<tr>
<td>What do these picture elements mean in Picture 1?</td>
<td></td>
</tr>
<tr>
<td>Why are these picture elements placed in a cloud-like shape?</td>
<td></td>
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</table>
What do you think Picture 1 as a whole wants to tell you?

Picture 2

What do you see in this part of Picture 2?

What do you see in this part of Picture 2?

Why is this picture element placed in a balloon-like shape?

What do you think Picture 2 as a whole wants to tell you?

Picture 3

What do you see in this part of Picture 3?

What do you see in this part of Picture 3?
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<tr>
<td></td>
<td>Why are these picture elements placed in a cloud-like shape?</td>
</tr>
<tr>
<td><img src="image2.png" alt="Image" /></td>
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<tr>
<td></td>
<td>What do you think Picture 3 as a whole wants to tell you?</td>
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</tbody>
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**Picture 4**

<table>
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<th>What do you see in this part of Picture 4?</th>
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<tr>
<td></td>
<td>What do you see in this part of Picture 4?</td>
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<td><img src="image4.png" alt="Image" /></td>
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<tr>
<td></td>
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<tr>
<td></td>
<td>What are these picture elements and what do they mean in Picture 4?</td>
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<td></td>
<td>What do you think Picture 4 as a whole wants to tell you?</td>
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### Picture 5

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<th>Question</th>
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<td>What do you see in Picture 5?</td>
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<td>What does the person on the right have in his hand?</td>
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<tr>
<td>What does the person on the left want?</td>
<td></td>
</tr>
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<td>What does this picture element mean in Picture 5?</td>
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<td>What do you think Picture 5 as a whole wants to tell you?</td>
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### Picture 6

<table>
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<th>Question</th>
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</thead>
<tbody>
<tr>
<td>What do you see in Picture 6?</td>
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</tr>
<tr>
<td>What does the person on the left have in his hand?</td>
<td></td>
</tr>
<tr>
<td>Question</td>
<td>Answer</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>What does the person on the right want?</td>
<td></td>
</tr>
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<td>What does this picture element mean in Picture 6?</td>
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<td>What do you think Picture 6 as a whole wants to tell you?</td>
<td></td>
</tr>
<tr>
<td>What do you see in Picture 7?</td>
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<tr>
<td>What’s up with the child in the front?</td>
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<tr>
<td>What is the woman doing and why?</td>
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<tr>
<td>What do you think Picture 7 as a whole wants to tell you?</td>
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</tbody>
</table>

**Picture 7**

- What do you see in Picture 7?
- What’s up with the child in the front?
- What is the woman doing and why?
- What do you think Picture 7 as a whole wants to tell you?
**Picture 8**

<table>
<thead>
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<th>What do you see in this part of Picture 8?</th>
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<td>How do the people Picture 8 look and how do you think they feel?</td>
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<td>What do you see in this part of Picture 8 and what do these picture elements mean?</td>
</tr>
<tr>
<td>Why are these picture elements placed in a cloud-like shape?</td>
</tr>
<tr>
<td>What do you think Picture 8 as a whole wants to tell you?</td>
</tr>
</tbody>
</table>

**Picture 9**

| What do you see in Picture 9? |
What does this picture element mean in Picture 9?

What do you think Picture 9 as a whole wants to tell you?

What do you see in Picture 10?

What does this picture element mean in Picture 10?

What do you think Picture 10 as a whole wants to tell you?

What do you see in Picture 11?

What do you think Picture 11 wants to tell you?
Picture 12

<table>
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</table>

<table>
<thead>
<tr>
<th>What do you think Picture 12 wants to tell you?</th>
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</table>

Thank you very much for your time!
Appendix E – Qualitative results per visual

Visual 1

The intended message of this visual was poorly comprehended, but better by literates than by low literates. Most respondents recognised that the woman was talking to the girl, despite the thought balloon on top of the girl’s head that was expected to be confusing, and many literates were able to see that the picture represented reproduction. Most low literates on the other hand just saw a family, probably because they did not make use of the plus and equals to signs. However, only a few respondents correctly interpreted that the entire visual concerned sexual information. The basic meaning thus was poorly understood and this might be the reason for the low recognition of modality in this visual. The respondents did not know what was going on in the visual, making it hard to notice a recommendation.

Visual 2

The comprehension of Visual 2 is comparable to that of Visual 1. Almost all respondents recognised that the male adult was talking to the boy about a condom. Yet again the condom was interpreted literally; not as sexual information. It is striking that much more low literate respondents interpreted this visual as a recommendation, compared to Visual 1. Seeing a condom and knowing that one of the most important advices concerning HIV/AIDS is that people should use condoms probably caused many respondents to interpret the intended message as “people should use condoms”. They did not realise that the man talking to the boy was an important element as well. Literate respondents often did realise this, but most of them interpreted the visual as a static situation. Only 15 percent of them recognised modality in this visual, which was not expected. I have no explanation for this low score of the literates.

Visual 3
The intended message of this visual was poorly comprehended. Although most people recognised the boy and the girl as a couple, the picture in the thought balloon as sexual activity and the cross as sign to indicate that having sex is not good only few people realised that the couple was too young to have sex and that they should postpone sexual activity. Only little over 20 percent of the low literates correctly interpreted the thought balloon and although the thought balloon is not essential for the comprehension of the entire visual it might have been of influence. The difficulty of the visual thus was not so much the comprehension of symbols and metonymy, but the need to link all elements in the visual to arrive at the intended message. Moreover, it is difficult to tell that the couple is too young. The text on the boy’s shirt is the only indication, but many low literates cannot read it and literates often overlooked it.

Visual 4

This visual was equally poor comprehended as Visual 2. Almost thirty percent of the low literates that did receive context comprehended Visual 4, but from low literates without context and literates only less then twenty percent correctly identified the intended message. The better score of the low literates from the context version is probably related to their better score on the recognition of modality. In general all visual elements were quite well understood. Most respondents recognised a couple being in love and all of them identified the condom. The speech balloon was more problematic, but especially in the case of the low literates from the context version bodily elements helped to recognise that the woman was talking. Still only half of the low literate respondents recognised this, against 76 percent of the literates. The most problematic aspect of this visual is again that respondents do not realise the importance of recognising that the woman is talking. Just like Visual 2 people tend to think the visual is about the need to use condoms, instead of the need to talk about the use of condoms.

Visual 5

This visual was rather well understood by literate participants (almost 70 percent), but only by less then forty percent of the low literates. Almost all respondents who recognised the two humans as two boys and identified the object that the boy on the right is holding as a razor
blade comprehended the intended message, namely that a razor blade should not be shared. The biggest problem in this visual is the recognition of the razor blade, which is depicted very small and unclear, and assigning the correct genders to the boys. Respondent that identified a man and a woman or thought the razor blade was a condom obviously were not able to tell the correct intended meaning of the visual. Wrong identification of these elements occurred more in the low literate groups then in the literate group, which might be the reason for the comprehension difference. The recognition of modality in this visual seems to be related to the comprehension of the cross: all literate respondents recognised that something was not allowed or should not happen. For low literates the comprehension of the cross was worse, just like the comprehension of modality.

**Visual 6**

The nature of Visual 6 is comparable to the nature of Visual 5. However, this visual is better comprehended by literates than Visual 5, but worse by low literates. Again it is not so much the comprehension of the visual elements that is problematic, but their interpretation. The cross and the injection are well understood, but respondents tend to relate the cross to using drugs instead of sharing an injection. The reason for this might be that the cross is through the entire visual, whereas the cross in Visual 5 only covered the hands that were sharing the razor blade. The good comprehension of the cross is probably the reason for the high score for the recognition of modality.

**Visual 7**

Visual 7 was comprehended by half of the low literate respondents that did not receive context and by slightly more of the other respondents. Almost all respondents recognised that the child was hurt and that the woman was signalling to the kids. That gesture, however, was interpreted in different ways. Many respondents recognised it as a stop sign to keep the children in the background away from the bleeding girl; others thought she wanted the children to come closer to offer some help. In both cases respondents referred to the bleeding child and the necessity to be careful around blood. Around two thirds of the respondents recognised modality in this
visual. For low literates from the version without context the percentage was lower: 60 percent. Respondents that were not able to tell the intended message thought the woman was praying, that she kept the children in the background away because they hurt the child, that the visual simply was about the protection of children etc.

**Visual 8**

This was probably the most difficult visual in the research material. The only respondents that were able to verbalize the correct intended message of the visual were some respondents from the context version and one literate respondent. The provided framework in this case revealed the basic message of the visual, making that the only reason why almost thirty percent of the low literate respondents comprehended this visual. The metaphor (monster stands for HIV/AIDS) was poorly comprehended and low literates experienced difficulty with the thought balloon as well. Against expectations the question mark was comprehended by more than eighty percent of the low literates (and by more than ninety percent of the literates). Moreover relatively few respondents recognised that the woman was pregnant. Almost all respondents recognised that the couple was worried or scared of something, but it proved difficult to understand why. The combination of a metaphor that is difficult to comprehend with other conventional symbols is probably the biggest problem in this visual. Not many respondents recognised modality in this visual, probably because they did not even understand what the picture was about, let alone that they can derive a message from it.

**Visual 9**

Visual 9 was well comprehended by literate respondents and low literates from the context version. Low literates who did not receive a framework scored worse. However, the cross and modality were well recognised by all respondents, so that is not the reason for the lower score of that one group of low literates. The results on recognising metonymy show that they are more likely to interpret the food on the picture literally, instead of recognising that the depicted products stand for unhealthy food in general. That is one reason for the poorer comprehension,
but a qualitative analysis shows that a number of the low literate respondents from the version without context absolutely had no idea what this visual wanted to tell them.

**Visual 10**

This visual was best comprehended of all the visuals. Only two respondents from the version without context were not able to tell the correct intended meaning. The tick was well comprehended, despite the fact that it is a conventional symbol. The combination with the cross in Visual 9, which was similar to Visual 10, might be the reason for this. Most respondents recognised that food depicted in the visual was healthy food and that it is therefore good to eat. However, not many people related this message to having HIV or AIDS. As proposed earlier respondents might have thought this was well-known and did not feel it was necessary to repeat it.

**Visual 11**

Against expectations the intended message of Visual 11 was comprehended by 50 percent of the low literates without context, almost 80 percent of the low literates with context and around 70 percent by the literate respondents. The percentages of respondents recognising modality in this visual were even higher for all respondent groups. This is striking since there is no modality signal in the visual and there are no bodily elements indicating recommendation. In fact this is, together with Visual 12, the most analogical visual of the research material. It seems that if it is clear what is going on in a visual people are more likely to recognise a recommendation.

**Visual 12**

Visual 12 was poorly comprehended, although a little better by literate than by low literate respondents. About half of the respondents who were not provided with context recognised modality in this seemingly analogical visual, for the respondents who did receive a framework
this percentage was higher: more than 70 percent. All respondents recognised that the woman
was sitting on a sofa reading a book. Reading a book, however is more often seen as studying
than as relaxing, leading more respondents to think this visual is about the need to learn more
instead of the need to relax more often. This seems to be the main reason for the low number of
respondents knowing the correct intended meaning. However, many respondents recognise that
what the woman is doing is good, even though there is no modality sign indicating this.
### Appendix F – Additional tables

The labels v1, v2 etc. in the tables refer to the visual in which the visual elements are represented.

**Table F1 Percentage of respondents comprehending meaning of bodily elements**

<table>
<thead>
<tr>
<th>Bodily elements to represent a state of being</th>
<th>Low literates without context</th>
<th>Low literates with context</th>
<th>Literates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child is injured v7</td>
<td>75.0</td>
<td>78.6</td>
<td>92.3</td>
</tr>
<tr>
<td>Woman is pregnant v8</td>
<td>25.0</td>
<td>14.3</td>
<td>84.6</td>
</tr>
<tr>
<td>People feel worried/sad/bad v8</td>
<td>66.7</td>
<td>84.6</td>
<td>91.7</td>
</tr>
</tbody>
</table>

**Bodily elements to represent speech**

<table>
<thead>
<tr>
<th>Bodily elements to represent speech</th>
<th>Low literates without context</th>
<th>Low literates with context</th>
<th>Literates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Woman is explaining v1</td>
<td>40.0</td>
<td>71.4</td>
<td>84.6</td>
</tr>
<tr>
<td>Father is talking v2</td>
<td>75.0</td>
<td>92.9</td>
<td>100</td>
</tr>
<tr>
<td>Woman is talking v3</td>
<td>50.0</td>
<td>50.0</td>
<td>76.9</td>
</tr>
</tbody>
</table>

**Gestures to ask for something/signal**

<table>
<thead>
<tr>
<th>Gestures to ask for something/signal</th>
<th>Low literates without context</th>
<th>Low literates with context</th>
<th>Literates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left boy wants to have razor from right boy v5</td>
<td>55.0</td>
<td>50.0</td>
<td>84.6</td>
</tr>
<tr>
<td>Right boy wants to have injection v6</td>
<td>60.0</td>
<td>28.6</td>
<td>76.9</td>
</tr>
<tr>
<td>Woman is signalling to children to (not) come closer v7</td>
<td>85.0</td>
<td>64.3</td>
<td>84.6</td>
</tr>
</tbody>
</table>

**Bodily elements as index**

<table>
<thead>
<tr>
<th>Bodily elements as index</th>
<th>Low literates without context</th>
<th>Low literates with context</th>
<th>Literates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left boy wants to shave himself/has beard v5</td>
<td>40.0</td>
<td>35.7</td>
<td>84.6</td>
</tr>
<tr>
<td>Right boy cut himself/just shaved himself v5</td>
<td>45.0</td>
<td>50.0</td>
<td>38.5</td>
</tr>
<tr>
<td>Left boy wants to inject himself v6</td>
<td>57.9</td>
<td>61.5</td>
<td>83.3</td>
</tr>
<tr>
<td>Right boy wants to inject himself v6</td>
<td>21.1</td>
<td>21.4</td>
<td>76.9</td>
</tr>
</tbody>
</table>
Table F2 Percentage of analogical objects recognised by low literate and literate respondents

<table>
<thead>
<tr>
<th>Object Type</th>
<th>Low literates without context</th>
<th>Low literates with context</th>
<th>Literates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condom v2</td>
<td>85.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Condom v4</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Razor blade v5</td>
<td>60.0</td>
<td>64.3</td>
<td>92.3</td>
</tr>
<tr>
<td>Injection v6</td>
<td>80.0</td>
<td>71.4</td>
<td>92.3</td>
</tr>
<tr>
<td>Bread V9</td>
<td>95.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>soda v9</td>
<td>95.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Bread V10</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Cheese V10</td>
<td>90.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Orange v10</td>
<td>100.0</td>
<td>100.0</td>
<td>90.9</td>
</tr>
<tr>
<td>Football v11</td>
<td>95.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Book v12</td>
<td>95.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>
Table F3 Percentage of conventional symbols recognised by low literate and literate respondents

<table>
<thead>
<tr>
<th></th>
<th>Low literates without context</th>
<th>Low literates with context</th>
<th>Literates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plus v1</td>
<td>50.1</td>
<td>50.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Equals to v1</td>
<td>37.6</td>
<td>42.9</td>
<td>92.3</td>
</tr>
<tr>
<td>Thought balloon v1</td>
<td>30.0</td>
<td>50.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Speech balloon v2</td>
<td>65.0</td>
<td>92.9</td>
<td>84.6</td>
</tr>
<tr>
<td>Text v3</td>
<td>5.0</td>
<td>0.0</td>
<td>30.8</td>
</tr>
<tr>
<td>Cross v3</td>
<td>85.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Thought balloon v3</td>
<td>21.1</td>
<td>23.1</td>
<td>100.0</td>
</tr>
<tr>
<td>Hearts v4</td>
<td>70.0</td>
<td>64.3</td>
<td>100.0</td>
</tr>
<tr>
<td>Speech balloon v4</td>
<td>45.0</td>
<td>35.7</td>
<td>76.9</td>
</tr>
<tr>
<td>Cross v5</td>
<td>85.0</td>
<td>92.3</td>
<td>100.0</td>
</tr>
<tr>
<td>Cross v6</td>
<td>90.0</td>
<td>78.6</td>
<td>100.0</td>
</tr>
<tr>
<td>Question mark v8</td>
<td>80.0</td>
<td>78.6</td>
<td>76.9</td>
</tr>
<tr>
<td>Thought balloon v8</td>
<td>30.0</td>
<td>50.0</td>
<td>92.3</td>
</tr>
<tr>
<td>Cross v9</td>
<td>80.0</td>
<td>85.7</td>
<td>100.0</td>
</tr>
<tr>
<td>Tick v10</td>
<td>90.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table F4 Percentage of respondents comprehending six forms of metonymy

<table>
<thead>
<tr>
<th></th>
<th>Low literates without context</th>
<th>Low literates with context</th>
<th>Literates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family = reproduction v1</td>
<td>45.0</td>
<td>42.9</td>
<td>92.3</td>
</tr>
<tr>
<td>Bed and clothes = sex v3</td>
<td>80.0</td>
<td>92.9</td>
<td>100</td>
</tr>
<tr>
<td>Depicted food = unhealthy food in general v9</td>
<td>45.0</td>
<td>84.6</td>
<td>69.2</td>
</tr>
<tr>
<td>Depicted food = healthy food in general v10</td>
<td>95.0</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Playing football = exercising in general v11</td>
<td>60.0</td>
<td>71.4</td>
<td>92.3</td>
</tr>
<tr>
<td>Sitting and reading = relaxing in general v12</td>
<td>50.0</td>
<td>50.0</td>
<td>69.2</td>
</tr>
</tbody>
</table>
Table F5 Mean number of times low literate and literate respondents recognised modality in visuals

<table>
<thead>
<tr>
<th>Visual</th>
<th>Low literates without context</th>
<th>Low literates with context</th>
<th>Literates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual 1</td>
<td>16.7</td>
<td>28.6</td>
<td>38.5</td>
</tr>
<tr>
<td>Visual 2</td>
<td>45.0</td>
<td>64.3</td>
<td>15.4</td>
</tr>
<tr>
<td>Visual 3</td>
<td>65.0</td>
<td>64.3</td>
<td>69.2</td>
</tr>
<tr>
<td>Visual 4</td>
<td>45.0</td>
<td>64.3</td>
<td>30.8</td>
</tr>
<tr>
<td>Visual 5</td>
<td>55.0</td>
<td>71.4</td>
<td>100</td>
</tr>
<tr>
<td>Visual 6</td>
<td>75.0</td>
<td>85.7</td>
<td>92.3</td>
</tr>
<tr>
<td>Visual 7</td>
<td>60.0</td>
<td>78.6</td>
<td>76.9</td>
</tr>
<tr>
<td>Visual 8</td>
<td>25.0</td>
<td>50.0</td>
<td>7.7</td>
</tr>
<tr>
<td>Visual 9</td>
<td>90.0</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Visual 10</td>
<td>95.0</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Visual 11</td>
<td>60.0</td>
<td>85.7</td>
<td>84.6</td>
</tr>
<tr>
<td>Visual 12</td>
<td>50.0</td>
<td>71.4</td>
<td>53.8</td>
</tr>
</tbody>
</table>

Table F6 Percentage of low literate and literate respondents comprehending the intended message of a visual

<table>
<thead>
<tr>
<th>Visual</th>
<th>Low literates without context</th>
<th>Low literates with context</th>
<th>Literates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual 1</td>
<td>0.0</td>
<td>7.1</td>
<td>38.5</td>
</tr>
<tr>
<td>Visual 2</td>
<td>10.0</td>
<td>23.1</td>
<td>15.4</td>
</tr>
<tr>
<td>Visual 3</td>
<td>30.0</td>
<td>28.6</td>
<td>46.2</td>
</tr>
<tr>
<td>Visual 4</td>
<td>10.0</td>
<td>28.6</td>
<td>15.4</td>
</tr>
<tr>
<td>Visual 5</td>
<td>35.0</td>
<td>38.5</td>
<td>69.2</td>
</tr>
<tr>
<td>Visual 6</td>
<td>15.8</td>
<td>21.4</td>
<td>75.0</td>
</tr>
<tr>
<td>Visual 7</td>
<td>50.0</td>
<td>64.3</td>
<td>61.5</td>
</tr>
<tr>
<td>Visual 8</td>
<td>0.0</td>
<td>28.6</td>
<td>7.7</td>
</tr>
<tr>
<td>Visual 9</td>
<td>63.2</td>
<td>92.9</td>
<td>84.6</td>
</tr>
<tr>
<td>Visual 10</td>
<td>90.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Visual 11</td>
<td>50.0</td>
<td>78.6</td>
<td>69.2</td>
</tr>
<tr>
<td>Visual 12</td>
<td>20.0</td>
<td>21.4</td>
<td>38.5</td>
</tr>
</tbody>
</table>