

Comparison of the Unmatched Count Technique, face to face interview and the Self-report Questionnaire in estimating base rates of sensitive behaviour: Unprotected sex and concurrent sexual partners.

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This project is submitted in partial fulfillment of the requirements for Psychology Masters in the School of Psychology, University of KwaZulu-Natal.

Declaration of Authorship

I Reshoketswe Neo Matlala declare that this is my own work.

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This thesis is the result of my own work and all sources used have been cited.

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ABSTRACT

There is a high rate of HIV/AIDS in the country and getting an estimate of the underlying contributing factors will help in creating interventions that will contribute towards reducing the high HIV rate. This study aimed to compare three methods the Unmatched Count Technique, Face to Face Interview and Self Report Questionnaire to explore which one yields higher rates of disclosure to questions about sensitive behavior. It aimed to get an estimate of people that engage in unprotected sex as well as those that have concurrent sexual partners amongst students. This study used a quantitative experimental survey design to compare the three methods. The study used convenience sampling and the questionnaires were randomised using the random number generator. A total of 283 questionnaires were analyzed.

The study found mixed results. The Unmatched Count Technique did not produce higher base rates than the Self Report Questionnaire and Face to Face Interview on all the sensitive questions as there were instances in which more respondents in the SRQ and FTFI endorsed the sensitive statement than in the UCT. The UCT produced negative numbers and it yielded lower levels of disclosure than the SRQ and FTFI on some of the sensitive statements. The SRQ was expected to elicit higher base rate estimates than the FTFI but instead the study found that the SRQ only elicited higher reporting for one sensitive statement out of five.

No statistically significant results were obtained for differences in disclosure levels of unprotected sex and multiple concurrent partners between the UCT, SRQ and FTFI on most of the questions. Accurate reporting of sexual behaviour is crucial especially in contexts where the major route of HIV transmission is through sexual intercourse. It is crucial in the creation of interventions that will respond directly to the problem. With the study having produced mixed results further research needs to be conducted in this area.

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1. INTRODUCTION

South Africa is greatly impacted by HIV and AIDS. The country has over 5.5 million people that are infected with the virus (Shisana *et al.* 2005). The country only accounts for 10-11% of the world's population yet it has the highest number of people living with the virus i.e. 64% (The Kaiser Family Foundation, 2007). The prevalence rate of HIV in South Africa is going on an upward trend (Kleinschmidt, Pettifor, Morris, MacPhail & Rees, 2007). In a survey conducted by Shisana *et al.* (2008) it is shown that the HIV prevalence rate has increased from 15,6 in 2002 to 16,9 in 2008.

The HIV rate is high amongst young people largely due to risky sexual practices such as unprotected sex and multiple concurrent partners. This is suggested in a study conducted by Makiwane and Mokomane (2010) on an eco-developmental analysis of high risk behaviors amongst the youth in South Africa. Their study suggested that the average age at which individuals become sexually active remains low (with children as young as 13 years old reporting having had sex) and that having multiple concurrent partners and engaging in unprotected sex are quite common practices amongst young people (Makiwane & Mokomane, 2010). Philemon and Kessy (2008) support this by arguing that sexually transmitted infections including HIV are more common amongst people that are between the ages of 15-24. Of all the ways in which the virus is transmitted heterosexual sex is identified as one of the common ways in which the virus is transmitted (Makhubele & Parker, 2008)

Unprotected sex and multiple concurrent partners are sensitive issues and hence data collected on them is always put into question. Fisher (1993) argues that much of the information we have about human behavior was gathered through self-report and that the problem with that is the fact that people have a natural tendency to want to present themselves in a positive way. This distorts the information gathered as people are usually not willing to give out information on sensitive behaviours or will give socially desirable responses (Fisher, 1993). It has been shown from other previous studies that; seeking to find out information about sensitive issues is problematic due to people wanting to appear good (social desirability) and people feeling shame to admit that they deviate from social norms. Questions on sensitive issues hence tend to get a high rate of nonresponse or are subject to a lot of error due to people withholding responses and not giving truthful answers (Tourangeau & Yan, 2007).

Interventions require that we have accurate measures and knowledge of underlying contributing factors and baseline measures i.e. know how certain behaviours contribute to the epidemic so as to design and implement interventions that can combat HIV. That is why it is crucial that this study be conducted because South Africa is burdened by HIV and AIDS. A range of survey methods have been used in the social sciences to attempt to extract information on sensitive issues. These data collection methods include the Audio Computer Assisted Self-Interview (ACASI), Automated Telephonic Data Collection (ATDC), Randomised Response Technique (RRT), Face To Face Interview (FTFI), Self-Report Questionnaire (SRQ) and the Unmatched Count Technique (UCT). However research has not been able to show which method is best at eliciting information on sensitive behaviour.

This study will use a quantitative experimental survey design to compare three methods: the Unmatched Count Technique (UCT), Self-Report Questionnaires (SRQ) and Face to Face Interviews (FTFI) to see which one yields higher rates of disclosure to questions about sensitive behavior. Methods were in the form of a questionnaire and respondents were randomized to answer either one of the questionnaires. The study used convenience sampling because its population were University of KwaZulu-Natal (Pietermaritzburg) campus students and they were approached on campus and asked to participate in the study. The findings may contribute to future research in helping understand which method is best in collecting sensitive information as well as assist in creating interventions that will help reduce HIV prevalence rate.

2. LITERATURE REVIEW

2.1 HIV in South Africa

According to UNAIDS (2009) the HIV prevalence rate makes South Africa one of the top 5 countries with the highest HIV prevalence rate in the world, with 11% of the population in South Africa being infected with the virus (UNAIDS, 2009). The most common form in which the virus is transmitted is through unprotected sex and multiple concurrent partners (Wargo, 2007). Young people continue to be at greater risk of getting infected with HIV (Kleinschmidt, Pettifor, Morris, MacPhail & Rees, 2007). One would think that young people are educated and informed about HIV yet the prevalence rate remains high amongst them. Hallman (2004) argues that the knowledge on how to protect oneself from infection is not always used because of economic and social factors. Especially in a country like South Africa, that is characterised by poverty and inequality. Hallman (2004) argues that low socioeconomic status does not only increase the chances of women engaging in sex for money (transactional sex) but that it also increases the chances of women being coerced to have sex as well as in increasing the chances of both men and women having concurrent sexual partners.

The idea of transactional sex and coerced sex removes the use of condom in the picture and this increases the risk of contracting HIV. In concurrent relationships the challenge of condom use is also brought up in that you may find that one uses a condom with casual partners only but not with their main partner. Just as Kleinschmidt et al. (2007) argue that the more sexual partners one has the higher their risk of getting infected with HIV. Wargo (2007) argues that in some instances women for example usually report that they do not engage in high risk behaviour yet it has been shown that they bear the biggest brunt of the virus as their prevalence rate is higher than that in men (Pettifor, 2005). This points out the challenge with methodologies and shows that more research is needed in this field especially when collecting information on sensitive behaviour, like unprotected sex and concurrent sexual partners.

2.2 Unprotected sex and concurrent sexual partners

Engaging in unprotected sex and having concurrent sexual partners are one of the social problems that South Africa is faced with (Kwili, 2004). According to Parker, Makhubele, Ntlabati and Connolly (2007) 'concurrent sexual partnership' can be defined in two ways.

They say that either an individual has two or more partners or he/she gets involved in a new partnership before ending the old one. Wargo (2007) describe them as relationships in which the men and women have more than one sexual partner at the same time. They say that these relationships can either be long or short term and that the meaning attached to them may also differ as they may range from one night stands to long-term relationships. Parker, Makhubele, Ntlabati and Conolly (2007) broke down the definition even further and say that multiple concurrent partners constitute the following situations: when one changes sexual partners regularly, when new sexual relationships form soon after meeting new people, engaging in one-night stands and having more than one sexual relationship within a short period of time.

Mah and Halperin (2008) argue that concurrent sexual partnerships can create an increase in the size of the epidemic as well as the speed at which people get infected with HIV and AIDS in society. This is due to the fact that an HIV positive individual can infect all his/her partners when they engage in unprotected sex, hence if the person has six partners then this increases the number of people living with HIV as well as the rate at which the virus is transmitted. According to Parker *et al.* (2007) there is a high association between the risk of getting infected with HIV and overall exposure to the virus. They go on to say that the higher the number of sexual partners an individual has the more likely he/she is to encounter a partner that is HIV positive. Wargo (2007) supports this by arguing that people increase their chances of getting infected by engaging in unprotected sex with more than one person. They argue that each of the partners that an individual is involved with might have their own network of partners with whom they are engaging in unsafe sex, hence this increases the risk of infection.

Parker *et al.* (2007) mention that there are factors that place one at higher risk of getting infected with the virus. These are: having an STI that is not treated or having an incurable STI and living in an area that has a high HIV prevalence rate (Parker *et al.*; 2007). Hence in a context like South Africa where the prevalence of HIV is very high the chances of one getting infected with the virus are higher than they would be in a context where they have a low HIV prevalence rate. In South Africa low risk sexual behaviors may result in one encountering a partner that is HIV positive (Parker *et al.*; 2007).

Unprotected sex as another social problem is described by Taylor-Seehafer and Rew (2000) as any sexual act that exposes and increases one's risk of contracting HIV or other sexually

transmitted infections. They argue that unprotected sex is most common amongst young people aged between 20-30. These risky sexual behaviours place individuals at risk of contracting HIV and AIDS which is one of the biggest problems that South Africa is faced with (Kwili, 2004). South Africa has the largest numbers of people living with HIV and AIDS globally, the number has increased from 4.21million in 2001 to 5.38 million in 2011 (STATSSA, 2011).

Due to the high prevalence of people living with HIV in South Africa fighting HIV has become a priority for HIV researchers (Bunnell & De Cock, 2006). In order for the interventions to work effectively though clinicians need to address the underlying factors (Bunnell & De Cock, 2006). Engaging in unprotected sex and having concurrent sexual partners are one of the ways in which people could get infected with HIV and AIDS. These are quite sensitive behaviours and in order for researchers and clinicians to know whether these factors contribute to the spread of the virus they would need people to disclose such information. Hence this information needs to be collected.

O'Brien (2010) argues that besides the sensitivity of the topic one also has to deal with the difficulty of which design to use in recruiting participants as well as the validity and reliability of the research. Fenton, Johnson, McManus and Erens (2001) argue that one would need to use methods that will minimize measurement error, which may be present because of the failure of participants to remember, their bias as well as their unwillingness to report sensitive behaviours. Edmunds and Scudder (2009) say that collecting data on a sensitive topic presents both methodological and ethical challenges.

2.2. Sensitive behaviour

According to Fenton, Johnson, McManus and Erens (2001) conducting a study on sexual behaviour is the key to understanding how sexually transmitted infections (STI's) are transmitted. The focus is said to have shifted to understanding people's patterns of risk behaviours for STI's/HIV transmission so as to inform prevention strategies. The problem though is that sexual behaviour is a private activity (sensitive behavior) and thus researching it poses a challenge, in that one has to produce results that are unbiased and reliable.

According to Tourangeau and Yan (2007) questions on sensitive topics tend to get a high rate of nonresponse or large measurement error. This is quite problematic considering the high rate of HIV in the country. It would help to know what the issues that are propelling the spread of the virus are and how rife they are, so they can be addressed. People are usually not willing to disclose such information because they do not want to be viewed as people that go against the norm. Draucker, Martsolf and Poole (2009) argue that studies that are conducted on sensitive topics face a range of ethical challenges. They argue that research on sensitive topics should be guided by the ethical principles of respect for autonomy, beneficence, non-maleficence and justice.

Mensch, Hewett and Erulkar (2003) state that the AIDS pandemic has made stronger the need to gather data on sexual behaviour. They argue that this is important for evaluating the effectiveness of HIV control programs. This would explain why it is essential that researchers get accurate reports of sexual behaviour. The problem though is that reports that people give on sexual behaviour are usually not accurate. One of the difficulties in collecting information on sexual behaviour is said to be due to cultural or religious reasons. For example, in most countries sex before marriage is considered to be improper, thus such participants are likely to deny that they are sexually active.

This is demonstrated in one survey that Mensch, Hewett and Erulkar (2003) conducted in Kenya on 1889 men and women. The survey asked participants about their sexual behaviour and also collected blood and urine samples from the participants so as to be tested for HIV and other STI's. It found that among 65 women who were aged between 15-24, who had reported that they were not sexually active, 17% of them were found to be HIV positive. This suggested that women tend to underreport or lie about their sexual behaviour. It could be argued though that perhaps the women were honest in their responses and that they did actually acquire HIV through other means such as through mother to child transmission or through needles. The question though is what the chances are that this could be the case for the whole 17% of the women that took part in the study. This was found to apply in an opposite fashion to men in that men tended to over report their sexual behaviour. The study suggested that men did so because such behaviour is praised and viewed as an honor in the society. It proves one's manhood as it would be said in many cultures.

Alexander and Fisher (2003) support this by arguing that men are likely to report having had their first sexual intercourse at a younger age as well as admitting to having many sexual partners. They suggest that this might largely be due to gender roles and expectations. Because of this participants tend to give false presentations of themselves through biased reporting or not deliberately through selective recall (Alexander & Fisher, 2003). This is the reason why social scientists have attempted using a range of methods in collecting data on sensitive behavior, to attempt to find one that elicits more accurate responses.

Einarsen and Valand (2010) say that sensitive behaviour can be looked at in three ways. It can be treated as a mode of disclosure, as intruding in people's lives and it can also be looked at in terms of social desirability. They argue that people might not want to disclose information because of the fear that their information might end up being known by the wrong kind of people. Arguing that respondents are concerned about what might happen if they were to give truthful answers and their information got leaked (Tourangeau & Yan, 2007). Questions on sensitive behaviour thus raise fear about the consequences of disclosed information becoming known by other people. Tourangeau and Yan (2007) argue that although surveys assure respondents of confidentiality and tell them that their information will not be disclosed, respondents are quite skeptical about such assurances. The concerns that respondents have about disclosure thus play an essential role in the misreporting of sensitive behaviour. According to Kaiser (2009) complete confidentiality should be granted to participants and says that rapport and trust should be built. Kaiser (2009) argues that in order to avoid misreporting the researcher needs to maximize the concepts of privacy and confidentiality. Whelan (2007) supports this by saying that researchers need to constantly assure respondents of confidentiality.

The second way in which research on sensitive behavior can be looked at is as an intruder. As an intruder, they argue that respondents might view the questions that they are being asked as being intrusive and thus as interfering with their private lives (Tourangeau & Yan, 2007). Questions asked on sensitive behaviour are seen as interfering, because they ask about issues that are not suitable for everyday discussions. Whelan (2007) argues that what respondents perceive as privacy will have an effect on how they respond to your questions. Sensitive questions are viewed as invading people's privacy despite what their responses might be (Tourangeau & Yan, 2007). Hence respondents might be skeptical about giving truthful responses. The third way is that participants might respond in a way that is socially

acceptable and thus give responses that are desirable and not answer according to what actually occurs in their own lives. Hence they might give responses in a way that presents them in a positive light.

Tourangeau and Yan (2007) argue that when participants are given sensitive questions they tend to respond in one of three ways:

- First, they might refuse to take part in the study. This affects the response rate in that it minimises the number of participants that could take part in the research and leads to a participation bias. Kaiser (2009) argues that if participants do not feel secure i.e. do not feel that their information will be kept confidential they are less likely to want to take part in your study or to give truthful responses. Hence for one's study to be credible they need to ensure that they assure participants on confidentiality.
- The second route is that participants might respond to the study but choose to leave out the sensitive questions (Tourangeau & Yan, 2007). This means that they would respond to some items and not respond to the items that are sensitive. Considering that the study would be on sensitive behaviour then such questionnaires would not be of use to the research because they wouldn't have answered the aim and purpose of the research i.e. if participants choose to only answer questions that are not sensitive. If participants answer the non-sensitive questions and provide no data on the sensitive questions then they have undermined the purpose of the study in that the actual aim of the study would be to gather data on sensitive behaviour. This is item non-response bias.
- The third route is that participants might not report truthfully and thus they might respond in accordance with what is socially acceptable in society rather than in accordance with their own behaviour (Tourangeau & Yan, 2007). This constitutes a huge error in research because the responses are not accurate or truthful. Whelan (2007) argues that as social beings, people are more likely to want to be perceived as being good hence they might give untruthful answers and this has huge implications for research

Einarsen and Valand (2010) argue that social desirability poses a threat to the validity of the data collection process. Chung and Monroe (2003) argue that the more unethical an action is the more it will attract socially desirable responses. This poses a challenge because it suggests that the more sensitive a topic is the harder it becomes to get responses that are accurate. For example if the research is on sexual behaviour then that poses a challenge for

the kind of strategies and interventions that can be implemented. How else will the interventions work in attempting to reduce risky sexual behaviour if an accurate representation of the sexual practice is not available?

Sakshaug, Yan and Tourangeau (2010) argue that researchers have used various methods in seeking to alleviate the effects of questionnaire sensitivity on non-response rates and on reporting error. Reporting error does not only result due to a failure to assure respondents of confidentiality and privacy, other factors are at play too (Kaiser, 2009). Findings are said to have shown that a number of variables can reduce the effects of question sensitivity, non-response and on improving accurate responses (Sakshaug, Yan & Tourangeau, 2010). A study should thus aim to reach meet all the requirements so his/her study can be valid and reliable. These variables are namely: the style of the questions, the setting in which the data is collected as well as the wording of the questionnaires (Sakshaug, Yan & Tourangeau, 2010). In terms of style, surveys are said to use a range of methods to collect data from respondents. Traditionally three methods have dominated in surveys and these are; face to face interviews, telephone interviews and mail surveys (Sakshaug, Yan & Tourangeau, 2010). This is said to have changed over the last few decades as new methods of computer administration have been introduced e.g. CAPI, ACASI. These methods differ in a number of ways but the main difference between them is on whether the questions are self-administered or not (Sakshaug, Yan & Tourangeau, 2010). The style refers to how the particular method works as well as the kind of information that a method can gather. Miller (2008) says that how the questions are presented in a questionnaire may also have an effect on the kind of responses you get.

Studies have shown that respondents are more willing to give reports on sensitive information when the questions are self-administered (Sakshaug, Yan & Tourangeau, 2010). In that way the interviewer is not seen as responsible for misreporting because the interviewer's mere presence does not seem to have much effect on the answer when the interviewer is present but not aware of what the respondent is reporting (Sakshaug, Yan & Tourangeau, 2010). According to Saksaug *et al.* (2010) respondents are more likely to leave out some of the items if the test is too long, hence they advise that tests should not be long. Miller (2008) argues that one should not put sensitive questions too early or too late in the survey because beginning with them might discourage the respondent from doing the survey and putting them at the end might leave respondents feeling awkward and might discourage them from

ever taking part in research again. Items should not be unclear or unambiguous as these might lead to respondents leaving out the items and this will result in missing data.

Sakshaug *et al.* (2010) argue that the setting in which the data is collected also plays a role in the respondent's decision to answer sensitive questions (Sakshaug *et al.* 2010). They argue that an environment that is safe and emphasizes to participants the issue of confidentiality i.e. that their information will be kept confidential is more likely to get truthful responses because participants are assured of confidentiality (Sakshaug *et al.* 2010). Kaiser (2009) agrees by arguing that the issue of confidentiality is crucial and plays in a major role in the kind of responses that one gets from respondents. This is expected because people are social beings and they are concerned about what others think of them. Hence if they are to give you information that is sensitive especially sensitive information, expect that they will only feel free to tell you once they are assured that the information will be kept confidential.

2.3. Social desirability

Ganster, Hennersey and Luthans (1983) argue that people do not respond truthfully because of their concerns for privacy. People are also likely to over-report socially desirable responses and this affects the quality of the data. Miller (2008) supports this by saying that people have a natural tendency to want to appear good and that if confidentiality is not assured then they will not answer truthfully. Ganster, Hennersey and Luthans (1983) argue that this affects the correlation between the dependent and independent variables, in that it does not reflect the true correlation or it gives a higher or a lower correlation than there really is. They argue that social desirability can produce a spurious correlation between variables e.g. it can be correlated with both the independent and dependent variables. Hence the correlation between the two variables might be due to their shared variance in social desirability and not due to shared variance in the constructs that are being measured in the study (Ganster, Hennersey & Luthans, 1983).

Ganster, Hennersey and Luthans (1983) argue that social desirability can affect data in three ways: By producing a spurious correlation, by suppressing the relationship or by acting as a moderating factor between variables. Hence it may either stop the true relationship from showing or it might assist a relationship which might have otherwise not been there had it not been present. It can affect the relationship between your variables (Whelan, 2007). Social desirability then as a suppressor can prevent the relationship between the variables, hence

create an illusion that there is no relationship. As a moderating factor social desirability may or may not be correlated with either one of the two variables (independent or dependent variables). These kinds of outcomes can affect the interpretation of any study or research question. Ganster, Hennessey and Luthans (1983) argue that social desirability can occur due to various factors. These are: on an individual's level of psychological adjustment, an individual's self-knowledge and on an individual's level of honesty or truthfulness.

Social desirability is based on the notion that there are clear social norms regarding behaviour and that answers that conform with such norms are considered socially desirable while those that do not conform are considered socially undesirable (Tourangeau & Yan, 2007). Fisher (1993) says that a question is sensitive when it seeks a response that is socially undesirable, thus when it asks respondents to admit that they have violated social norms, e.g. that they have engaged in unprotected sex, drugs or that they have multiple partners. In this case sensitivity is determined by whether the individual has violated social norms or not, because the questions would not be sensitive to someone that has not violated social norms (Tourangeau & Yan, 2007). For example if you were to ask a person that is not sexually active whether he/she has had unprotected sex they would answer "no" and they would not view the question as being sensitive. Whereas if you asked a person that has engaged in unprotected sex the same question they would view it as being sensitive because they know that they are expected to have safe sex and answering yes to the question would mean that they have violated the norm.

Accurate reporting of sexual behaviour is crucial especially in contexts where the major route of HIV transmission is through sexual intercourse (Mensch, Hewett & Erulkar, 2003). It is crucial because the intention is to reduce the transmission of the virus and unless we know the ways in which people place themselves at risk and also get an idea of how many people do so; we cannot really come up with interventions that will respond directly to the problem. Inaccurate reports of sexual practices provide a distorted view of the risk of HIV and thus it is difficult to know who is having sex and under what kind of circumstances (Mensch, Hewett & Erulkar, 2003). They argue that the problem with inaccurate reports is that they undermine the kind of analyses produced by social science research that aims to understand and explain such behaviour. This also affects and undermines programs that attempt to evaluate whether interventions that are designed to change sexual behaviour are effective.

The problem with surveys is that they might tend to overestimate condom use. This is because particular girls would not admit to being sexually active in that there is some embarrassment in admitting that one is sexually active (Kwili, 2004). This might imply that girls who are comfortable reporting that they are sexually active are more inclined to use condoms. Hence surveys are prone to giving estimates of condom use that are biased.

Chung and Monroe (2003) argue that people have a natural tendency to want to appear more humane than they actually are. Hence people are more likely to deny actions that are socially undesirable and instead lie and admit to socially desirable ones. They argue that through the process of socialization women are conditioned to reason differently when it comes to moral issues. They argue that women are more concerned about creating good impressions about themselves and thus they are more prone to give socially desirable responses to questions on sensitive behaviour (Chung & Monroe, 2003). Men on the other hand are raised in societies that honor 'real men' and those are men that can prove their manhood by having multiple concurrent partners and by being sexually active. This is one of the reasons why they are more likely to over report their sexual behavior.

Blackbeard and Lindegger (2007) agree by arguing that there are hegemonic masculinities that exist in society. They state that those are dominant ideas that are socially constructed and they provide information on what it means to be a man in a given context. These hegemonic masculinities contribute to the overestimation of data in that such males will most likely exaggerate their risky sexual behaviours. Gibbs and Jobson (2011) argue that hegemonic forms of masculinities promote multiple concurrent partnerships and that they reduce the chances of men engaging in safe sex hence they increase risky sexual behavior. Campbell (1997, p. 275) argues that these hegemonic forms of masculinity provide 'recipes for living' for men. Hence they act as models that men can refer to in their pursuit of proving their manhood. Next the concept of multiple sexual partnerships is discussed in detail.

2.4. Multiple sexual partnerships

According to Berry and Hall (2009) multiple sexual partnerships are viewed as being indicative of high risk sexual behaviour because they largely increase an individual's risk of transmitting HIV through sexual networks. Chopra, Mathews and Tomlinson (2008) conducted a study on the risks of sexual behaviour amongst men that have multiple sexual partners in an informal settlement on the outskirts of Cape Town. Their study used

respondent driven sampling (RDS) to recruit participants. Hence they found men with multiple sexual partners and those men referred them to other men with multiple sexual partners. Participants were thus accessed through their social networks.

The sample consisted of 421 men and they interviewed them, took an anonymous HIV test and they offered them some voluntary counselling and testing (VCT). Their results indicated that men engage in high levels of sexual risk behaviour. They found that the men had multiple sexual partners and that this practice was highly encouraged and praised by their friends. These men reported that they used condoms inconsistently and that this happened mostly with their main partners. The men also reported that they engage in high levels of transactional sex. They also mentioned that they consume a lot of alcohol and that shebeens are a place at which they meet new sexual partners. Alcohol has been pointed out as one of the factors that contributes to the risk of engaging in unprotected sex. These men are engaging in multiple concurrent partners and they get partners in shebeens while they have consumed alcohol. This places them at the danger of engaging in unprotected sex and thus at the risk of increasing the number of people that are already infected with HIV and AIDS in the country.

Mohapeloa (2006) argues that the key drivers of HIV and AIDS in South Africa are multiple concurrent partnerships that have an inconsistent condom use and low levels of male circumcision. Berne (2009) supports this notion by arguing that the lack of safe circumcision practices as well as the practice of not using the condom consistently increases the risk of HIV infections amongst many South Africans. Berne (2009) says that adding multiple sexual partnerships to these two factors is important in seeking to reduce the spread of HIV and AIDS.

Berne (2009) argues that despite the fact that it is a challenge to know exactly how many infections are caused by having multiple sexual partnerships, what is evident is that 60% of such infections occur amongst people that are aged between 15 and 25. In a South African communications survey conducted in 2006 by CADRE it was found that amongst people aged between 18 and 30 more than one-third of males and one tenth of females were involved in relationships with two or more partners within the previous 12 months (Berne, 2009). According to Wargo (2007) multiple concurrent partners occur for a number of reasons. In some societies they occur because the practice is valued and thus people want to increase

their social status and some people engage in them because they see it as their cultural right or social right. Wargo (2007) argues that despite knowing that multiple concurrent partners do exist and that there are a range of reasons why they occur it is still crucial that data be gathered to record how rife it is so interventions can be put in place to reduce the practice and hence the AIDS pandemic.

Hallman (2004) conducted a study in KwaZulu-Natal on how socioeconomic status can influence sexual behaviours of young men and women age 14 to 24 years. The study used household survey to collect the data. The study found that economic disadvantage significantly increases the likelihood of one engaging in risky sexual behavior (Hallman, 2004). This increases the chances of HIV transmission because the ability to negotiate condom use is minimized, hence there is a high risk of contracting STI's and of females falling pregnant (Hallman, 2004).

2.5. Unprotected sex

Engaging in unprotected sex (risky sexual behavior) is an issue that is faced by most young adults (Allen, Carey, Manopaiboon & Jenkins, 2002). One needs to bear in mind that risky sexual behavior does not only put people at risk of unwanted pregnancy, but it also puts them at risk of contracting Sexually Transmitted Infections (STI's) and HIV and AIDS (Allen *et al.* 2002). As mentioned earlier by Taylor-Seehafer and Rew (2000) unprotected sex is most common amongst young people. Hence one of the indicators of unprotected sex is teenage pregnancy. Rutenberg, Kaufman, Macintyre, Brown and Karim (2003) argue that teenage pregnancy is one of the social problems in the country, 30% of 20-24 year olds having given birth by the time they reach age 20.

This is supported by Swartz (2002) who says that teenage pregnancy is a huge concern as found by the South African Demographic Health Survey (SADHS) that 35% of all teenagers had fallen pregnant or had a child by the time they reached age nineteen (19). Swartz (2002) also mentions just how the issue of teenage pregnancy has other consequences especially for Africans and Coloureds as they are most hit by poverty in the country. Teenage pregnancy is also more likely to increase the number of single struggling teenage mothers in that the teenagers are still in school and some even dropout of school. It then becomes difficult to raise their children as they have no income and the fathers are seldom present as most deny taking responsibility.

The Kaiser Family Foundation (2007) argue that risky sexual behavior is largely influenced by the fact that most young people do not perceive themselves as being at risk of HIV infection. In a survey conducted by the Kaiser Family Foundation (2007) two-thirds (67%) of young South Africans reported to have had sexual intercourse, this includes 47% of 15-19 year olds and 88% of 20-24 year olds. The survey was titled 'young South Africans broadcast media and HIV and AIDS awareness' and it was conducted in all the nine provinces in South Africa. The survey also found that 66% reported that they had a main partner. The respondents in the survey also reported inconsistent use of the condom even in situations where they were uncertain about whether their partners use a condom with other people or not.

There has been a study conducted on high school students in Jozini KwaZulu-Natal on their practices and knowledge of contraception (Oni, Prinsloo, Nortje & Joubert, 2005). The study found that there was a high rate of engagement in risky sexual behavior amongst the participants with 75,2% of the males and 61,5% of the females saying that they had engaged in unprotected sex (Oni et.al, 2005). The rate of pregnancy is high in Kwa-Zulu Natal with children as young as 14 falling pregnant (Mchunu, 2006). The Mercury conducted an informal survey which suggested that the two most common reasons for why girls were falling pregnant were that they were forced by economic reasons as well as the need to prove their womanhood (Mchunu, 2006).

The Kaiser Family Foundation (2007) supports this by arguing that there are a range of reasons that influence a person's behavior and these include cultural, social, political and economic factors. Olafuyi (2008) agrees by arguing that one of the reasons why women are less likely to negotiate safe sex is because of economic reasons. He argues that some women are financially dependent on men and hence are afraid to negotiate safe sex because of the fear that the men might leave them. Olafuyi (2008) also argues that the power that is given to men make it difficult for women to negotiate safe sexual practices. The Kaiser Family Foundation (2007) argues that another factor that plays a role in unsafe sex practice is alcohol in that when people are drunk they are less likely to be able to negotiate condom use or to be capable of choosing which partner to sleep with. A range of reasons exists for why people engage in risky sexual behaviour yet data needs to be collected on them.

2.6. Data collection methods

Collecting data on sensitive issues has proven to be problematic. This is worrying given the high rate of people living with HIV and AIDS in South Africa, because researchers need to have information about sensitive issues so interventions can be developed to address such issues. Gathering information on risky sexual behavior is a challenge because this is a sensitive area. Researchers have thus conducted a range of methods in seeking to explore sensitive issues.

They have used methods such as: the ACASI, ATDC, RRT, FTFI, SRQ and the UCT. These methods are all aimed at getting accurate answers about sensitive issues. Dalton, Wimbush and Daily (1994) argue that when gathering information on sensitive issues one needs to use an approach that will be effective enough to elicit accurate responses. They argue that what is needed is an approach that will enhance participants' willingness to take part and still assume anonymity which will encourage them to report truthfully (Dalton, Wimbush & Daily, 1994).

2.7. Audio Computer Assisted Self Interview (ACASI)

According to Caspar (2008) Audio computer assisted self-interviewing is a method in which participants are asked questions through a computer and they listen to the questions using headphones. The participants respond directly into the computer by pressing buttons on the keyboard (Caspar, 2008). According to Mierzwa and Souidi (1999) ACASI allows for standardization in its interviews because the questions are posed in exactly the same manner throughout all interviews. The interviewer is the same for all respondents thus the questions are asked in the same way and the voice stays constant.

Mierzwa and Souidi (1999) also say that ACASI is flexible because it accommodates illiterate people. Hence people that cannot read or write can still take part in a study that uses ACASI as a data collection method. This is because if a person cannot read he/she can just listen to the voice on the computer asking the questions and they can press the relevant button to answer. Hence they do not need to be literate because all they do is press a button to say they agree and another to indicate that they do not agree.

Simoës, Bastos, Moreira, Lynch and Metzger (2006) contradict the above statement by arguing that by using computers, the ACASI excludes people that have a low educational

level. This is supported by a study conducted by Van der Elst, Okuku, Nakamya, Muhaari, Davies, McClelland, Price, Smith, Graham and Sanders (2009) in Kenya on whether the Audio Computer-Assisted Self-Interview (ACASI) is useful in assessing risky behaviour amongst female and male sex workers. They recruited 519 participants for their study and 72 of those participants were not able to complete the ACASI because they could not read.

Caspar (2008) though argues that the ACASI has been shown in various studies conducted that it can increase respondents' reports on sensitive issues. Mierzwa and Souidi (1999) say this is because ACASI allows for confidentiality in that respondents give their responses quietly and in private. The ACASI allows for privacy because only the respondent can hear the questions being asked (Caspar, 2008). Mierzwa and Souidi (1999) say that although an interviewer is present for the duration of the interview he/she does not know how the participants respond to the questions in the survey. Simoes *et al.* (2006) argue though that the ACASI cannot probe respondents' when their answers are ambiguous. Hence faced with this kind of problem how can one say with confidence that the respondents answered to what the interviewer was really asking. Thus although the ACASI has been shown in some studies to effectively elicit responses on sensitive issues it also has its limitations.

2.8. Automated Telephonic Data Collection (ATDC)

According to Opdenakker (2006) ATDC is a method that researchers use to conduct interviews over the telephone. The ATDC has a broad geographical access (Opdenakker, 2006). One can access people from a large population when using this method. Opdenakker (2006) argues though that this method is biased because only people that have telephones can take part in the study and it automatically excludes people that do not have telephones. The recruited sample will not be representative of the general population because it over represents a particular population (Opdenaker, 2006). Van Heerden (2013) disagrees and argues that 60% of South Africans either own or have access to cell phones. Cell phones are considered the most common pervasive device that is available currently.

Opdenakker (2006) says that conducting the ATDC takes up a lot of time and that it is expensive because the interviewer will either have to clarify or repeat some of the questions during the interview. For example people might still need the interviewer to clarify some questions when they do not understand and it is still costly because it requires airtime. Again cellphones might require the interviewer to work after hours because most people are either at

tertiary institutions, school or at work during office hours hence if the particular study is interested in those populations then they will have to work after hours and over the weekends. Again with some people you find that one cellphone is used by more than one person which introduces other issues e.g. privacy just in case the owner does not want the other members of the family to know that he/she is participating in a study.

Opdenakker (2006) mentions though that the advantage of the ATDC is that it allows interviewers to reach populations that might be hard to interview face to face e.g. stay at home mothers with children or workers that work shifts etc. Opdenakker (2006) argues that ATDC is suitable for asking about sensitive issues. Green and Krosnick (2003) disagrees and argues that the telephone does not allow the interviewer and respondent to build a clear understanding thus the individual might not trust the interviewer to keep their information confidential. Respondents may thus decide not to disclose information that is sensitive.

2.9. Randomized Response Technique (RRT)

The RRT is a technique that seeks information on a probability basis rather than by asking the questions directly (Soeken & Macready, 1982; Coutts & Jann, 2008). The RRT is aimed at increasing respondents' willingness to respond truthfully to sensitive questions (Himmelfarb & Lickteig, 1982). Coutts and Jann (2008) argue though that the RRT may lead respondents to doubt the worth of the randomizing process or make them feel that they are being deceived by the researcher into giving information. The technique also tends to get low responses because it is not easy to understand and it takes long to complete (Coutts & Jann, 2008).

2.10. Face To Face Interviews (FTFI)

According to Opdenakker (2006) a face to face interview is a discussion that is held with a purpose between an interviewer and a respondent. The discussion can help one collect data that is relevant to the objectives of the research (Opdenakker, 2006). Face to face interviews remove the issue of literacy level and visual impairment because respondents do not have to read questions like they would be required to in a survey using questionnaires (koponen & Tolonen, 2010). FTFI also provide respondents with an opportunity to ask for clarity when they do not understand the questions being asked (koponen & Tolonen, 2010). Koponen and Tolonen (2010) argue though that face to face interviews consume a lot of time and have

additional labour costs and that respondents might give socially desirable answers by trying to impress the interviewer.

An important aspect of face to face interviews is that there should be rapport when conducting such interviews. Rapport between an interviewer and a participant is good for survey interviews in that it motivates respondents to answer truthfully even on questions that are sensitive thereby reducing response bias (Benney, Riesman & Star, 1956; Holbrook, Green & Krosnick, 2003). They argue that this is a way in which face to face interviews have the ability to generate responses that are valid.

Another method that is underused is the Informal Confidential Voting Interview (ICVI). The ICVI is said by Gregson, Mushati, White, Mlilo, Mundandi and Nyamukapa (2004) to be composed of two methods i.e. FTFI and self-completion methods. The first component of the ICVI uses an informal part of the FTFI method and this is said to be so that rapport can be built between the respondent and the person undertaking the interview and to also encourage the respondent to open up (Gregson *et al.*, 2004). The order in which the questions are designed is to start off by asking general questions and to move gradually to more sensitive questions (Gregson *et al.*, 2004). The information on more sensitive questions is sought in the second half of the interview using a secret voting procedure, this is usually done using voting boxes.

The person conducting the ICVI explains to the respondents the purpose of using the voting boxes, that they are used to ensure confidentiality and he/she then writes the respondents' identity numbers at the back of the voting strips and distribute those to the respondents. He/she then reads out the questions and the respondents write their answers on the voting strips and place those in the voting boxes (Gregson *et al.*, 2004). External supervisors who did not know the identities of the respondents take the voting strips out of the boxes and match those to the questions asked and to the respondents' identity numbers (Gregson *et al.*, 2004). This method retains the rapport built and assures the respondents of confidentiality (Gregson *et al.*, 2004). Phillips, Molitor, Boily, Lowndes, Gurav, Blanchard and Alary (2012) agree by arguing that the ICVI reduces social desirability in that it increases the privacy of the interview setting. This method however as mentioned earlier is underused and it is a bit cumbersome (Gregson *et al.*, 2004).

2.11. Self Report Questionnaires (SRQ)

According to Dalton, Wimbush and Daily (1994) self-report questionnaires are likely to yield inaccurate responses when asking about information that is sensitive. They argue that respondents will usually not give honest answers or they will give vague answers because of the stigma attached to one acknowledging that they do engage in such behaviour (Dalton *et al.*, 1994). This is termed social desirability in that respondents tend to answer questions in a way that will make them look good or in ways that they think the researcher would want them to respond (Dalton *et al.*, 1994). The validity of Self-report Questionnaires is thus usually called into question (Dalton *et al.*, 1994).

According to Koponen and Tolonen (2010) self-report questionnaires are cost effective but the problem is that they make the assumption that all respondents have good eye sights and that they are literate. Self-report questionnaires also make the assumption that the questions are clear and understandable (Koponen & Tolonen, 2010). Considering this, the question is thus how confidently can one say that the responses gathered are reliable, in that there is a possibility that some respondents answer some questions even when they do not understand them. Self-report questionnaires are said to remove the effect of the interviewer but may be problematic because it may result in missing data because respondents tend to leave out questions that they are uncertain about (Koponen & Tolonen, 2010). Hence with the absence of the interviewer i.e. no one to clarify the questions; respondents are likely to not answer the questions which then results in missing data or they may answer just for the sake of answering (i.e. give unreliable responses).

Koponen and Tolonen (2010) also argue though that self-report questionnaires provide respondents with privacy and that they are thus appropriate to use for sensitive questions. Waruru, Nduati and Tyllrskar (2005) argue that questions on sensitive behaviour should not be explored using self-report questionnaires because respondents tend to respond dishonestly. They argue that all that the researcher has at the end of the day are reports of the respondents, and considering all the biases that the data is prone to (such as social desirability) what justification does the researcher have for merely believing the results as they are.

This is further supported by Weindhardt, Forsyth, Carey, Jaworski and Durant (1998) who argue that the extent to which self-report responses on sexual behaviour could be trusted has always been questioned in the United States. They say that for example, Lewontin (1995) has

argued that self-reports that are conducted on sexual behaviour are unreliable and invalid. He argues that this is due to the multiple sources of bias that the self-report questionnaire is prone to, such as participants underreporting behaviour that is stigmatized and over reporting behaviour that is socially desirable.

Authors like Brody (1995) have also suggested that the validity of self-report data for sexual behaviours is undependable, arguing that participants in most research on behaviour issues or change are likely to intentionally misrepresent themselves. Newman, Des Jarlais, Turner, Gribble, Cooley and Paone (2002) agree by arguing that researchers should not view responding to potentially sensitive questions as ‘providing data’ but rather that it should be seen as an activity that has multiple motivations. These range from social respect to wanting to acquire social support. This is one of the reasons why self-report data should be questioned.

2.12. Unmatched Count Technique (UCT)

According to Imai (2010) the unmatched count technique (UCT) is a method that intends to obtain truthful answers to sensitive questions from respondents. The unmatched count technique comprises of two questionnaires and one acts as a control for the other. Each questionnaire has sets of statements, some sets include the sensitive behavior and some do not. Respondents read the set of statements and then state how many are true for them, they do not indicate which statements those are but they just give a number of how many apply to them. Tsuchiya, Hirai and Ono (2007) describe it as a technique that asks questions indirectly about sensitive behaviour. For this reason the UCT is expected to come up with more accurate estimates of answers (Tsuchiya, Hirai & Ono, 2007).

2.13. Previous methodological comparative studies

Mensch, Hewett and Erulkar (2003) conducted a study on the reporting of sensitive behaviour amongst adolescents in Kenya. They collected data from a sample of 4400 unmarried adolescents between the ages of 15 and 21. They assigned participants to one of the three modes of interviewing: ACASI, face to Face interviews and paper and pencil self-administered interviews. They found that there was a significant difference in reported rates of premarital sex across the three interview modes. The face to face interview elicited higher reports on questions about whether one has had a boyfriend or girlfriend. For some questions

though like those on drug use and STI's the difference in responses across modes are quite minimal. While for questions on HIV/AIDS the reporting was found to be higher for ACASI than in the other modes. The ACASI though had the lowest reports on premarital sex. What was noted is that there was no consistent pattern of reporting between the modes.

At the end of data collection the participants were asked about their experience of the interviews. Participants in the ACASI mentioned that they could not understand how the computer could be able to playback their responses to them and that this made them suspect that the interview was live and that the interviewer was someone on the other side of the country asking the questions. This is because they could not understand how something that is taped can playback the responses they give. Researchers hence suspected that this might have affected the participants' decision on whether to report truthfully or not, in that it seems that because of this, participants were skeptical about whether their information will be kept confidential. This is mentioned by Newman *et al.* (2002) who argue that there may be contexts in which respondents may find answering on a computer to be distant and remote and this may have an effect on how they report their behaviour.

This conflicts with a study conducted by Langhaug (2009) in which four methods were compared to assess the validity and reliability of self-reported data in rural-Zimbabwean youth. The study enrolled 1495 participants and they were randomly allocated to either one of the four methods. The questionnaire modes included the self-administered questionnaire (one was done on paper and one was accompanied by an audio soundtrack), face to face interviews which used an informal confidential voting box and the audio computer-assisted survey instrument (ACASI). The study found that the SAQ and audio SAQ scored significantly higher rates in item non-response than FTFI and ACASI. When comparing the audio SAQ and ACASI respondents to those of the SAQ it found that the Audio SAQ and ACASI respondents were twice as likely to report sexual activity and thus information on sensitive behavior and no difference was found between SAQ and FTFI. The ACASI respondents also reported that they felt at ease because they believed that their responses will be kept confidential and that this encouraged them to answer truthfully.

Two methods out of the four were then chosen to complete the final survey and those were the ACASI and the audio SAQ. The results that were found provided strong evidence that the ACASI reduces bias, that it is friendly to use and that it can be used even with people that are

not computer literate. This thus conflicts with the study above in that participants in this study were also from rural areas yet they felt comfortable reporting their behavior on the ACASI. The ACASI has found to be accepted in developing countries and even in areas where there is little knowledge about computers, it is argued that participants have reported feeling more comfortable responding on a computer than with other methods especially when reporting sensitive behaviour (Le, Blum, Magnani, Hewett & DO, 2006; Rumakom, Guest, Chinvarasopak, Utmarat & Sontanakanit, 2005). These studies hence contradict with the findings of the study above in that they have evidence that the ACASI have worked in areas with no computer literacy, this just shows that more comparative studies still need to be conducted to validate findings.

Kim, Dubowitz, Hudson-Martin and Lane (2008) conducted a similar study on the comparison of three data collection methods for gathering sensitive and less sensitive information. They wanted to see which of the three data gathering methods is better at collecting sensitive information. These were: face to face interviews, self-administered paper and pencil questionnaires and the audio computer assisted self-interview (ACASI). Their sample consisted of 514 parents who bring their children of 0-5 years to a pediatric primary care clinic. The parents were assigned to either of the interviewing modes. The results showed that the ACASI elicited higher rates for sensitive problems such as social isolation and parental stress, with face to face interviews following in the second position. It was found that there was a significant difference between ACASI and self-administered pencil and paper questionnaire on most questions, whereas the difference between the ACASI and face to face interviews was small. There was no significant difference between the three modes in terms of the questions on less sensitive issues. Again here it is clear that although significant differences were found on most items they were not found on all questions, which just shows how these methods tend to give mixed results. Just like the study that will be mentioned next.

Durant and Carey (2000) aimed to assess sexual behavior in young women and they compared two methods (self-administered questionnaires and face to face interviews). Their study consisted of 190 participants who completed measures of erotophilia and social desirability and their behaviours were then monitored in a diary for eight weeks. The participants returned on two instances to complete either the FTFI or SAQ. Then in order to check the accuracy of the respondents' retrospective self-reports a difference was calculated by deducting responses that were obtained on the two questionnaire modes from the diary.

What was found was that both methods were reliable, however that SAQ had less discrepant answers for protected sexual intercourse but that reports for unprotected sexual behaviours were equivalent. They concluded that both methods were reliable and that the SAQ may be more accurate for some sexual behaviours. This shows how there is room needed for more research in this area, and it is another reason why this study will be comparing these three methods.

Adebajo, Obianwu, Eluwa, Vu, Oginni, Tun, Sheehy, Ahonsi, Bashorun, Idogho and Karlyn (2014) conducted a study using FTFI and the ACASI to collect information on sexual and drug injecting behaviours from men who have sex with men. The study found that men who were interviewed using the ACASI reported significantly higher sexual behavior with both women and men. They were more likely to self-identify as homosexual and report drug use. Adebajo *et al.* (2014) argue that the feasibility of the ACASI should thus be explored further in high risk areas in Nigeria to increase the likelihood of obtaining more data that is accurate. Minnis, Muchini, Shiboski, Mwale, Morrison, Chipato and Padian (2007) disagree and argue that they still wuestioning the reliability and validity of the ACASI. Minnis *et al.* (2007) conducted a study using the ACASI and FTFI to collect information from women about hormonal contraceptive use. In addition they collected information during clinical exams from records. The ACASI yielded higher reports on several reproductive health behaviours yet there were discrepancies between the findings on the ACASI and FTFI with those of clinical records. This emphasizes further the need for more research in the field.

The study also compared the UCT in that it is said to provide respondents with both confidentiality and anonymity (Dalton *et al.*, 1994). It gives respondents the assurance that their information will be kept safe, that people will not be able to trace it back to them and that the researcher will not know who answered which questionnaire (Dalton *et al.*, 1994). Ong and Weiss (2000) argue that some studies have found that individuals disclose more sensitive information under anonymous conditions. Newman *et al.* (2002) argue that the level of information that respondents reveal is positively related to the level of privacy of the data collection method. Hence respondents are more likely to disclose and reveal information if they trust that their information will be kept safe and confidential and that it will not be leaked to other people. Seeing that it is crucial to gather valid and reliable results in order for effective interventions to be produced these methods will be compared in this study; these are the UCT, FTFI and SRQ.

2.14. Summary

HIV and AIDS is rife in this country with over 5.5 million people living with the disease (Shisana *et al.* 2005). The country's epidemic remains the largest worldwide, with KwaZulu Natal being the leading province with the highest number of people infected with HIV (UNAIDS, 2010). This is problematic and interventions need to be created to combat the transmission of the virus. Unprotected sex and having concurrent multiple partners contribute to the transmission of HIV/AIDS in South Africa. But how much can we attribute to each behavior? Such information is needed in order for interventions to be created because we need to understand not only how the virus is transmitted but also need to have an idea of how many of the population engage in such risky behavior as that will also help us understand the 'why' question.

To determine this, research has to be conducted to gather such information. Gathering information on sensitive behavior though, poses a challenge because one has to produce results that are unbiased and reliable, yet people tend to give untruthful responses to sensitive questions. The various studies conducted thus far give contradicting results, hence more comparative studies still need to be conducted to validate findings. Methods tend to give mixed results and it makes it hard to say this one method is better than the other. And unless we have a method that will assist in gathering such information (sensitive information) not much progress can be made on decreasing the transmission of the virus. More research is still needed in this area and this study is a step in that direction. It will help advance knowledge and help researchers in developing interventions that are aimed at prevention.

3. METHODOLOGY

3.1 Aim and rationale

This study aims to compare three methods the Unmatched Count Technique, Face to Face Interview and Self Report Questionnaire to explore which one yields higher rates of disclosure to questions about sensitive behavior.

- It aims to get an estimate of people that engage in unprotected sex as well as those that have concurrent sexual partners amongst students.
- It also aims to see which method is most suitable for getting higher rates of disclosure from respondents.

This study is essential because there is a high rate of HIV and AIDS in the country and getting an estimate of the underlying factors will help in creating interventions that will contribute towards reducing the high HIV rate.

The hypotheses for the study:

Null hypothesis: There is no significant difference in base rates estimates between the Self-report questionnaire and the Unmatched Count Technique for each of the sensitive behaviours.

Alternate hypothesis: There are significantly higher base rates estimates for the Unmatched Count Technique than the Self-report questionnaire in each of the sensitive behaviours.

Null hypothesis: There is no significant difference in base rates estimates between the Self-report questionnaire and the face to face interview for each of the sensitive behaviours.

Alternate hypothesis: There are significantly higher base rates estimates for the Self-report questionnaire than the face to face interview in each of the sensitive behaviours.

Null hypothesis: There is no significant difference in base rates estimates between the Unmatched Count Technique and the face to face interview for each of the sensitive behaviours.

Alternate hypothesis: There are significantly higher base rates estimates for the Unmatched Count Technique than the face to face interview in each of the sensitive behaviours.

3.2. Research Design

The research design that was used in this study is a quantitative experimental survey design to compare three methods, the UCT, FTFI and SRQ. This method was chosen because the study aimed to assess the accuracy of the three methods that are being compared, it could not use a descriptive design because it did not merely want a description of the variables (Lowhorn, 2007). These methods were used to ask people about sensitive behaviour (unprotected sex and concurrent sexual partners). The study aimed to see which method elicits higher rates of disclosure to questions about sensitive behavior. The study looked at whether the methods yielded consistent results as with previous and this was found to not be the case (Nunally & Berstein, 1994). The study did measure the intended variables i.e. unprotected sex and concurrent sexual partners (Nunally & Berstein, 1994). The study cannot be generalizable to the entire population because the sample size was small (Lowhorn, 2007).

3.3. Sampling

3.3.1. Sampling method

In this study convenience sampling was used because participants were recruited by being approached on the grounds around campus and asking them whether they would like to take part in the study. Different lecturers were also approached and asked for permission to speak to their students about the study. The population of interest were students at the University of KwaZulu-Natal (Pietermaritzburg) campus that are over the age of 18 as those are old enough to give their own consent on whether they take part in the study or not. The participants were given an informed consent form to sign which informed them about the purpose of the study as well as assure them of confidentiality. There was no set venue for the collection of data hence once respondents were approached and expressed interest in taking part in the study there would be an attempt to find a quiet room (especially with respondents that were randomized to the FTFI). There was no incentive for having participated in the study instead respondents were only thanked for their time.

3.4. Data Collection instruments

The UCT comprises of two forms, each form has five sets of questions and some of the sets only contain statements but do not contain the sensitive question (LaBrie & Earlywine,

2000). The layout of the questionnaire as well as the non-sensitive statements were adapted from previous studies (Dalton *et al.*, 1994; LaBrie & Earleywine, 2000). Statements in the questionnaires had to be relevant to the South African context (Teddlie & Tashakkori, 2009), sensitive statements were formulated following from literature found in studies on unprotected sex and multiple concurrent partners (Makiwane & Mokomane, 2010; Parker *et al.* 2007) that were conducted in South Africa. Statements were formulated from themes that came up in these studies. However the non-sensitive items were adopted from those used by Dalton *et al.* (1994) and LaBrie and Earleywine (2000) because of time constraints.

The set in the UCT form A that does not contain the sensitive question acts as a control for the sets in the UCT form B that contain questions on the sensitive behavior (LaBrie & Earlywine, 2000). In this study a list of questions was given to the two groups and the lists were the same except for the fact that some of the sets of questions contained the sensitive behavior and the others did not. For example UCT form A had the questions on the sensitive behavior on set 2 and 4.

The UCT form A contained the following sensitive questions:

Set 2 : I have had more than one sexual partner

Set 4 : I have had unprotected sex

The UCT form B had the sensitive questions on set 1, 3 and 5 and the sets contained the following questions:

Set 1: I am currently sexually active

Set 3: I have had multiple partners

Set 5: I have had unprotected sex with more than one person

The sets in each questionnaire hence acted as control for each another (LaBrie & Earlywine, 2000). Participants were asked to write down the number of activities that apply to them on the list without indicating which behaviour they are referring to (LaBrie & Earlywine, 2000). The self-report questionnaire was also used to collect data and it was given to participants in the order that was assigned by the random number generator. The same was done with the face to face questionnaire. The self-report questionnaire contained sensitive questions on statement 2, 4, 6, 8 and 10. Participants were told that they had been randomly selected to answer the self-report questionnaire, and were then given the questionnaires to fill in. The participants were required to respond with a true or false answer to the statements.

Statement 2: I have had sex without a condom

Statement 4: I have had more than one sexual partner

Statement 6: I have had unprotected sex

Statement 8: I am currently sexually active

Statement 10: I have had unprotected sex with more than one person

The face to face interview required that participants answer yes or no to the statements given. After giving participants information about the study and after they had signed the informed consent to say that they agree to take part in the study. Participants were told that they had been randomly selected to answer the face to face to interview and that a set of statements will be read out to them to which they had to answer yes or no depending on whether the statements applied to them or not. Participants were asked a few random questions to build rapport and put them at ease. The issue of confidentiality was also further emphasized just so they could know and trust that the researcher would not leak the information that they give. This was so they could feel free to disclose their information in that rapport contributes towards the generation of valid responses. Sensitive questions were on statement 4, 8, 12, 16 and 20.

Statement 4: Are you currently sexually active?

Statement 8: Have you had more than one sexual partner?

Statement 12: Have you had unprotected sex?

Statement 16: Have you had multiple partners?

Statement 20: Have you had unprotected sex with more than one person?

The social desirability scale was included at the bottom of each of the questionnaires. It was labeled as “attitudes towards others” and it was in the form of a 5 point likert scale. With 1 representing definitely true, 2 representing mostly true, 3 representing don’t know, 4 representing mostly false and 5 representing definitely false. Participants had to indicate by ticking or crossing on the relevant number how true or false each statement was about their relationship towards others. The social desirability scale (SDRS) was included to measure socially desirable responding for each mode of survey delivery (Hays, Hayashi & Stewart, 1989). The social desirability scale (SDRS) asked the participants about their relations with other people (Hays, Hayashi & Stewart, 1989). It required them to indicate using a number

ranging from 1 to 5 how true or false a statement is in describing the relation they have with other people (Hays, Hayashi & Stewart, 1989). The study hence used the 5-item socially desirable response set (SDRS-5) as an instrument to measure social desirability (Hays, Hayashi & Stewart, 1989). However the social desirability scale (SDRS) in this study could not be analyzed because individual scores are confounded by proportions (Tourangeau & Yan, 2007). This is explained further under the data analysis section.

3.4.1. Randomization of the questionnaire

To eliminate selection bias and increase validity the study used a random number generator. The three methods were divided into four categories, hence the UCT form A was coded as 1, UCT form B as 2, SRQ as 3 and FTFI as 4 (Research randomizer, 2011). The randomizer was programmed to randomly assign 50 people to each of the four conditions and this was adopted from Labrie and Earleywine (2000) who argue that a minimum of 40 to 50 participants are required for each questionnaire. Participants were thus randomized to one of the four conditions: UCT form A, UCT form B, SRQ or the FTFI. The study however ended up having more respondents hence the random number generator randomly assigned a total of 300 questionnaires only 283 were analyzed though because of a number of reasons (see results section).

3.5. Research process

The questionnaires were divided into four conditions, and they were given out to participants randomly. The study used the random number generator to randomly generate numbers from 1 to 300 hence it indicated which questionnaire should be answered by the first respondent, second respondent, third respondent etc. Respondents were thus approached in the order randomly generated by the random number generator. Hence for example when I bumped into a group of five friends I began by introducing myself and then I verbally gave them information on the study. I then gave them the information sheet and when they expressed interest in taking part in the study, I gave them the informed consent form to sign to indicate that they have understood the purpose of the study and that they agree to participate. Then I would give the first friend the questionnaire that is suggested by the random number generator to be next, then I would give the next one the next suggested questionnaire etc. Participants were then verbally thanked for participating in the study.

3.5.1. Ethical considerations

For the study to be ethical it considered the following ethical principles: autonomy, non-maleficence, confidentiality, informed consent, and a balanced cost/benefit ratio (Terre Blanche *et al.*, 2006).

3.5.1.1 Autonomy

The study ensured that participants were given clear information about the research and that their identities and the information that they gave was kept confidential (Wassenaar, 2004). Participants were told that they had a right to choose whether to take part in the study or not and their decision were valued and respected. Hence the study did not just assume that participants knew that they have autonomy (Ritcher, Lindegger, Abdool-Karim & Gasa, 1999).

3.5.1.2. Non-maleficence

The study took into account the principle of nonmaleficence in that participants were not harmed in any way by the research (Wassenaar, 2004; Draucker, Martsof & Poole, 2009). Participants were told that if any of the questions made them uncomfortable they were allowed to withdraw from the study at any point. Also that if any of the questions caused them distress in anyway and they needed help they could go be referred to the student counseling centre on campus.

3.5.1.3. Informed Consent

The participants in the study were given clear and detailed information about the study before they could fill in the questionnaires. They were given an information sheet which outlined the aims of the study and had my supervisor's contact details for any complaints that the participants might have concerning the study. Participants were also told that participation is voluntary (Emanuel, Wendler, Killen & Grady, 2004). The participants were given informed consent forms to sign in order to show that they have understood the details of the study and that they were willing to participate in the study (attached in appendices 4) (Emanuel *et al.*, 2004).

3.5.1.4 Confidentiality

Participants were assured of confidentiality, they were told that their information will be kept

safe and that their information will not be linked to them in any way. When filling in the section on demographics on the questionnaires participants wrote down their ages, gender, race and year of study and they did not have to provide their names.

3.5.1.5. Cost/Benefit Ratio

The study also took into account the principle of beneficence. It weighed up the benefits against risks (Wassenaar, 2004; Emanuel *et al.*, 2004). It mentioned to the participants in the information sheet that although the study does not have direct benefits it has indirect benefits. Participants were told that they may benefit indirectly in that the study might be used in future research to inform campaigns on preventing risky sexual behavior. That the results of the study might add value to the design of interventions, and thereby contribute towards reducing the rate of HIV in the country.

3.6. Data analysis

In analyzing the data the study used Winks SDA (Statistical Data Analysis software) statistical test of proportions. The study has worked out the mean differences between the UCT form A and B so as to calculate the percentage of people that endorse the sensitive behaviours. Thus it took the average number of behaviours in the control group and subtracted them from the average number of behaviours in the actual group of the UCT A and B form and this gave us an estimate of the frequency of the sensitive behaviour (LaBrie & Earlywine, 2000). The base rates were calculated using the formula:

$$\text{Estimate } (p) = \text{mean}(b) - \text{mean}(a),$$

Where p is the proportion of subjects involved in sensitive behaviour, mean (b) is the mean number of the statements agreed with within the set with the sensitive statement and mean (a) is the mean number of the statements agreed with within the set without the sensitive statement. The estimate was then multiplied by 100 so as to get the percentage of participants that endorse the sensitive behavior.

The Self Report Questionnaire (SRQ) and the face to face to face interviews (FTFI) were also analyzed using Winks SDA (Statistical Data Analysis software) which worked out the proportions of the responses given for the sensitive statements for each of the questionnaires. They both required one response out of two choices (dichotomous data). These were also converted into proportions and then compared. For example those of the first sensitive question in the UCT were compared to those of the first sensitive question on the SRQ and

then to that of the FTFI etc. Hence Winks statistical software produced proportional differences between the UCT, SRQ and FTFI for each of the sensitive statements and the statements were compared to each other to see what proportions of people endorsed the sensitive behavior e.g. in the UCT as opposed to the SRQ. The WINKS SDA was used to conduct pairwise tests of proportions. These data collection instruments (UCT, SRQ and FTFI) are attached in appendix 1.

3.6.1. Social desirability

Social desirability in this study could not be analyzed because individual scores are confounded by proportions (Tourangeau & Yan, 2007). The data was thus not able to be analyzed or discussed. The scale that was used lacked ‘true scores’ which made it hard to differentiate between respondents who are indeed compliant to social norms, those who genuinely have a distorted view of themselves as well as those who are deliberately responding in a socially desirable manner (Tourangeau & Yan, 2007). Again the UCT produces aggregate estimates instead of individual scores hence it is not possible to workout social desirability scores for each individual (Tourangeau & Yan, 2007). Social desirability is thus not analyzed in the study.

4. Results

The study found mixed results and the methods did not perform as expected. Various reasons could account for these such as sample size, gender effects, over reporting, under reporting, social and cultural reasons and respondents doubting the issue of confidentiality and anonymity etc. These are discussed in detail under the discussion section.

4.1 Sample

In the study a total of 300 questionnaires were handed out but only 283 questionnaires were completed. 73 respondents completed the UCT form A, another 70 respondents completed the UCT form B, 73 completed the self-report questionnaire and the last 67 completed the face to face interviews. Hence only 283 questionnaires were analyzed because some of the forms were incomplete. 14 of the respondents that answered the self-report questionnaire had left out the sensitive questions; hence those had to be discarded. The other 3 respondents answered incorrectly they did not follow the instructions correctly.

4.2 Participant and population demographics

For each of the demographics collected there will be a table or a graph displaying the number of participants or the distribution of the numbers. In the sample that was analyzed there was a total of 157 females and 126 males. A total of 77 females answered the UCT, a total of 43 females answered the face to face interviews and a total of 37 females answered the self-report questionnaire. A total of 66 males answered the UCT, a total of 30 males answered the face to face interviews and a total of 30 males answered the self-report questionnaire. The female participants outnumbered the male participants and this is also evident in the demographics of UKZN in that there are more female students than male students. The reason why the study used 143 respondents for the UCT is because Labrie and Earlywine (2000) suggested that a minimum of 40-50 respondents is required for each questionnaire. The table below hence displays the number of participants that took part in each of the methods.

Table 1 Total female and male participants per questionnaire

Questionnaire	Females	Males	Total
UCT A	37	36	73
UCT B	40	30	70
SRQ	37	30	67
FTFI	43	30	73
Total	157	126	283

RACE OF PARTICIPANTS

The demographics of the students of UKZN (Pietermaritzburg campus) show that there are more Africans than any other race. Africans constitute 75% of the student population, followed by Indians with 13%, then whites with 10% and lastly followed by coloureds with 2%. These demographics can be seen in table 2 below. In this study 73% of the participants were African, 12% were Indian, 8% White, 6% coloured and only 1% were unidentified as they did not tick on the questionnaires to indicate what race they are. This study sample therefore approximates the demographics of the UKZN student population.

When looking at the representation, it can be argued that African people were represented in the study as 73% were analyzed as compared to the 75% that is in the UKZN population, Indian students composed 12% of the total sample compared to the 13% in the UKZN population, hence they were also represented. White students composed 8% compared to 10% in the UKZN population hence they were also represented well.

Coloured students composed 6% compared to the 2% in the UKZN population hence there was an over representation of coloured students. Despite there being an over representation the demographics of the sample in the study do resemble the one of the UKZN students in that just like with the UKZN one there were more African students participants, followed by Indians, then whites and lastly coloured students. This is also shown by the difference in percentages between the UKZN demographics and those of the sample. The differences are small, e.g. Africans had a percentage difference of -2%, Indians had a percentage difference of -1%, Whites had a percentage difference of -2% and Coloureds had a percentage difference of +4%.

Table 2: the demographics for PMB UKZN students

Sum of students for 2011					Sum of participants within the study				
Race	Female	Male	Total	Percentage	Female	Male	Total	Percentage	Percentage difference
African	5030	3621	8651	75%	112	95	207	73%	-2%
Indian	884	563	1447	13%	16	17	33	12%	-1%
White	614	478	1092	10%	17	7	24	8%	-2%
Coloured	159	83	242	2%	10	6	16	6%	+4%
Other	30	23	53	0%	2	1	3	1%	+1%
Total	6717	4768	11485	100%	157	126	283	100%	

The following table, table 3 shows the race distribution per questionnaire. African respondents constituted 73% within the UCT A, 59% within the UCT B, 90% within SRQ and 70% within the FTFI. Indian respondents constituted 14% within the UCT A, 20% within the UCT B, 1% within SRQ and 11% within the FTFI. White respondents constituted 1% within the UCT A, 14% within the UCT B, 6% within SRQ and 14% within the FTFI and Coloured respondents constituted 8% within the UCT A, 7% within the UCT B, 3% within SRQ and 4% within the FTFI. The percentages do not differ largely as the distribution across the different questionnaires is similar to the one of the overall study. Africans still constitute a high percentage across all the different questionnaires, followed by Indians, Whites, Coloureds and then lastly the unidentified race.

Table 3: Total Race distribution per questionnaire

Questionnaire	Female	Males	Total	Percentage per questionnaire
UCT A	37	36	73	100%
African	23	30	53	73%
Indian	7	3	10	14%
White	1	0	1	1%
Coloured	4	2	6	8%
Unidentified	2	1	3	4%
UCT B	40	30	70	100%
African	25	16	41	59%
Indian	6	8	14	20%
White	5	5	10	14%
Coloured	4	1	5	7%

Unidentified	0	0	0	0%
SRQ	37	30	67	100%
African	33	27	60	90%
Indian	0	1	1	1%
White	3	1	4	6%
Coloured	1	1	2	3%
Unidentified	0	0	0	0%
FTFI	43	30	73	100%
African	31	20	51	70%
Indian	3	5	8	11%
White	8	2	10	14%
Coloured	1	2	3	4%
Unidentified	0	1	1	1%
Total	157	126	283	

AGE OF PARTICIPANTS

Table 4 placed below shows the ages in years of all the respondents per questionnaire. What can be seen from the table is that most of the respondents were between the ages 19 and 22. They constituted over half of the total sample size of 282 as they made up 199 of the total sample size. The remaining 83 respondents were distributed between the ages 18, 23 to 28 with a few being in the age 29, 32 and 40. The remaining 4 participants were unidentified as they did not disclose their age when they were filling in the questionnaires. Figure 3 shows the distribution of age for all the respondents including respondents that did not enter their age.

Table 4: Participants by age per questionnaire

Age	UCT A	UCT B	SRQ	FTFI	Total
18	4	4	3	1	12
19	6	13	9	20	48
20	15	14	7	13	49
21	16	14	13	16	59
22	14	10	13	6	43
23	7	9	7	8	31
24	4	5	6	5	20
25	1		1	1	3
26	1		1	1	3
27			2		2

28	2	1	3		6
29	1				1
32			1		1
40			1		1
Unidentified	2	0	0	2	4
Total	73	70	67	73	283

YEAR OF STUDY OF PARTICIPANTS

Table 5 shows the year of study per questionnaire of all the respondents. Most of the respondents were in their second and third year of study as shown in the table. 15% of the respondents of the total sample size were in their first year, 35% was in their second year, 34% were in their third year, 8% were in their fourth year, 3% were in their fifth year and 5% were unidentified. Figure 4 shows the distribution of year of study for all respondents.

Table 5: Distribution of year of study per questionnaire

Questionnaire	1	2	3	4	5	Unidentified	Total
UCT A	14	24	26	6		3	73
UCT B	8	27	26	5	2	2	70
SRQ	12	13	25	8	8	1	67
FTFI	9	35	19	3		7	73
Total	43	99	96	22	10	13	283

4.3 Mean differences between the UCT form A and UCT form B

The estimates for the UCT were calculated using the formula: Estimate (P) = mean – mean. Table 6 shows the differences between the two forms for each set containing the sensitive statement. Multiplying the numbers by 100 gives the percentage of respondents endorsing the sensitive behaviour.

Table 6: Differences in means between the UCT form A and UCT form B gender

Sets	Set 1	Set 2	Set 3	Set 4	Set 5
Sensitive statement	I am currently sexually active	I have had more than one sexual partner	I have had multiple partners	I have had unprotected sex	I have had unprotected sex with more than one person
Females	0.74	-0.13	0.04	0.64	-0.01
Males	0.09	0.04	0.24	0.62	0.64

Set 1: 74% of female participants endorsed the sensitive behaviour “I am currently sexually active” and 9% of the male participants endorsed the sensitive behaviour “I am currently sexually active”.

Set 2: 4% of males endorsed the sensitive behaviour “I have had more than one sexual partner” and for females a negative proportion was found.

Set 3: 4% of female participants endorsed the behaviour “I have had multiple partners” and 24% of the male participants endorsed the behaviour “I have had multiple partners”.

Set 4: 64% of female participants endorsed the behaviour “I have had unprotected sex” and 62% of the male participants endorsed the behaviour “I have had unprotected sex”.

Set 5: 64% of the male participants endorsed the behaviour “I have had unprotected sex with more than one person” and for females a negative proportion was found.

4.4 Differences between UCT and SRQ for sensitive items

In the table below the differences that were found between the UCT and SRQ are displayed, and the table has been divided into males and female.

Table 7 UCT and SRQ proportional differences: females and males

Total number of Participants (N=)	UCT A & B (%) (N=77) (Females)	SRQ (%) (N=43) (Females)	P – value	Significance	UCT A & B (%) (N=66) (Males)	SRQ (%) (N=30) (Males)	P – value	Significance
I am currently sexually active	74%	38%	0.001 (<0.05)	Significant	9%	57%	0.001 (<0.05)	Significant
I have had more than one sexual partner	Negative proportion	32%	*	*	4%	6%	0.001 (<0.05)	Significant
I have had multiple partners	4%	43%	0.001 (<0.05)	Significant	24%	63%	0.001 (<0.05)	Significant
I have had unprotected sex	64%	46%	0.068 (>0.05)	Insignificant	62%	67%	0.637 (>0.05)	Insignificant
I have had unprotected sex with more than one person	Negative proportion	8%	*	*	64%	4%	0.028 (<0.05)	Significant

4.5 Differences between UCT and FTFI for sensitive items

In the table below the differences that were found between the UCT and FTFI are displayed, and the table has been divided into males and female.

Table 8 UCT and FTFI proportional differences: females and males

Total number of Participants (N=)	UCT A & B (%) (N=77) (Females)	FTFI (%) (N=43) (Females)	P – value	Significance	UCT A & B (%) (N=66) (Males)	FTFI (%) (N=28) (Males)	P – value	Significance
I am currently sexually active	74%	53%	0.019 (<0.05)	Significant	9%	79%	0.001 (<0.05)	Significant
I have had more than one sexual partner	Negative proportion	35%	*	*	4%	57%	0.001 (<0.05)	Significant
I have had multiple partners	4%	21%	0.03 (<0.05)	Significant	24%	5%	0.013 (<0.05)	Significant

I have had unprotected sex	64%	60%	0.664 (>0.05)	Insignificant	62%	64%	0.854 (>0.05)	Insignificant
I have had unprotected sex with more than one person	Negative proportion	16%	*	*	64%	43%	0.059 (>0.05)	Insignificant

4.6 Differences between SRQ and FTFI for sensitive items

In the table below the differences that were found between the SRQ and FTFI are displayed, and the table has been divided into males and female.

Table 9 SRQ and FTFI proportional differences: females and males

Total number of Participants(N=)	SRQ (%) (N=43) (Females)	FTFI (%) (N=) (Females)	P – value	Significance	SRQ (%) (N=30) (Males)	FTFI (%) (N=28) (Males)	P - value	Significance
I am currently sexually active	38%	53%	0.179 (>0.05)	Insignificant	57%	79%	0.074 (>0.05)	Insignificant
I have had more than one sexual partner	32%	35%	0.777 (>0.05)	Insignificant	6%	57%	0.816 (>0.05)	Insignificant
I have had multiple partners	43%	21%	0.034 (<0.05)	Significant	63%	5%	0.318 (<0.05)	Insignificant
I have had unprotected sex	46%	60%	0.211 (>0.05)	Insignificant	67%	64%	0.211 (>0.05)	Insignificant
I have had unprotected sex with more than one person	8%	16%	0.277 (>0.05)	Insignificant	4%	43%	0.277 (>0.05)	Insignificant

5. Discussion

The differences that were found for each of the sensitive items are discussed below by comparing results found in one method with another method on the sensitive statements.

5.1. Differences between UCT and SRQ for sensitive items

In table 7, the UCT performed as expected for females on two sensitive statements: “I am currently sexually active” and “I have had unprotected sex”, with UCT eliciting higher reporting for females than SRQ. Hence it performed in line with what is argued in the literature (LaBrie & Earleywine, 2000; Dalton *et al.*, 1994; Wimbush & Dalton, 1997). The result found on the statement “I have had multiple partners” is surprising for the females in that the UCT produced lower estimates than SRQ. This can be explained by the fact that respondents do not understand the mathematical machinery behind the technique; this might make them mistrust the UCT and make them suspect that their responses can be found out somehow (Chaudhuri & Christofides, 2006). As a result respondents in the UCT might have not trusted the UCT and instead underreported their behavior.

The UCT again did not perform as expected for the statements “I have had more than one sexual partner” and “I have had unprotected sex with more than one person” in that it gave negative estimates. These results were unexpected in that the UCT is usually reported to yield significantly higher levels of disclosure than other methods (LaBrie & Earleywine, 2000; Dalton *et al.*, 1994; Wimbush & Dalton, 1997).

LaBrie and Earleywine (2000) argue that when conducting the UCT it is important that one does the process of randomisation thoroughly and that a large sample is used. This study may have compromised the sample size element in that due to time constraints the study only met and went a little under the recommendations set by LaBrie and Earleywine that say that there has to be about 40 to 50 respondents in each of the UCT conditions (LaBrie & Earleywine, 2000). Glynn (2010) supports this by arguing that getting negative estimates when conducting the UCT could be due to using inadequate sample sizes. Tsuchiya *et al.*, (2007) argue this matter further by saying that when using small sample sizes in the UCT you are

likely to get mean differences that are unstable. This is because there are large variances in small sample sizes (Tsuchiya *et al.*, 2007).

Another factor that might have contributed to the negative estimates is the selection of non-sensitive items in the UCT (Glynn, 2010). He argues that non-sensitive items should be carefully chosen in that if not they will create response defensiveness. This study adopted non-sensitive items from those used by Dalton *et al.* (1994) and LaBrie and Earleywine (2000) and hence it might be that these non-sensitive items elicited response defensiveness. It is thus essential that questions be piloted before they can be administered to respondents in a study (Glynn, 2010). The selection of non-sensitive items could be a factor that has contributed to the unexpected results that the UCT elicited in this study. This is further supported by Chaudhuri and Christofides (2006) who argue that the non-sensitive items in the UCT should be chosen in a way that they be more related to the target item instead of using meaningless and unrelated distractors that are not related.

For the males the UCT performed as expected on only two statements and produced surprising results on three of the sensitive statements. It produced quite low estimates compared to the SRQ on three of the statements. This could be explained by gender effects, in that the males could have chosen to under report because the data was collected by a female. This is supported by Catania, Binson, Canchola, Pollack, Hauck and Coates (1996) who argue that questions on people's sexuality are sensitive to interviewer gender effects e.g. when asked by an interviewer of the opposite gender the respondent may feel embarrassed and as a result he/she might under or over report. At the same time it is argued that males have hegemonic masculinities and thus we expect them to over report (Blackbeard & Lindegger, 2007). This shows that more research is still needed in this field.

5.2 Differences between UCT and FTFI for sensitive items

In table 8, a significant difference was found for females between the UCT and FTFI for the sensitive statement "I am currently sexually active". With UCT eliciting higher reporting as 74% of the females in the UCT endorsed the sensitive behaviour as opposed to 53% in the FTFI. This result was expected. The opposite occurred for the statements "I am currently sexually active" and "I have had more than one sexual partner", for males between the UCT and FTFI. The UCT produced lower estimates than expected with FTFI eliciting higher

reporting as 79% of the males in the FTFI endorsed the sensitive behaviour as opposed to 9% in the UCT, and 57% of the male respondents in the FTFI endorsed the sensitive behaviour as compared to only 4% in the UCT. Not only were these results unexpected but there are also huge difference between the two methods. This could be explained by the fact that males being expected to be more sexual in society are likely to brag about their sexual life hence they had no hesitation in reporting that they are sexually active in a Face to Face interview and their mistrust in the UCT could have influenced the way they responded on the UCT (Chaudhuri & Christofides, 2006).

The UCT and FTFI female scores could not be compared for the sensitive statements “I have had more than one sexual partner” and “I have had unprotected sex with more than one person” because a negative number resulted when calculating the UCT A and B form. This is problematic considering that the UCT is expected to produce higher estimates. The negative proportions as discussed occur because of a number of reasons e.g. that the sample size is too small (Tsuchiya et al; 2007), whether randomization was done properly (LaBrie & Earleywine (2000) and the careful selection of distractor items (Chaudhuri & Christofides, 2006).

An insignificant difference was found for both males and females between the UCT and FTFI for the sensitive statement “I have had multiple partners”. With UCT eliciting higher reporting for males as 24% of the male respondents in the UCT endorsed the sensitive behaviour as opposed to only 5% in the FTFI. The unexpected was found for females though in that the FTFI elicited higher reporting with 21% of females endorsing the sensitive behaviour as opposed to only 4% in the UCT.

An insignificant result was found for both males and females between the UCT and FTFI for the sensitive statement “I have had unprotected sex”. With UCT eliciting higher reporting as 64% of the female respondents endorsed the sensitive statement as opposed to 60% in the FTFI. The opposite result was found for males in that the FTFI elicited higher reporting for male respondents, with 62% males endorsing the sensitive the behaviour in the FTFI as opposed to 60% in the UCT. The differences in proportions were quite small between the two methods though. A significant result was found for males between the UCT and FTFI for the sensitive statement “I have had unprotected sex with more than one person”. With UCT

eliciting higher reporting as 64% of the male respondents endorsed the sensitive behaviour as opposed to 43% in the FTFI.

5.3 Differences between SRQ and FTFI for sensitive items

In table 9, an insignificant difference was found for both males and females between the SRQ and FTFI for the sensitive statement “I am currently sexually active”. Unexpectedly the FTFI elicited higher reporting for both males and females. 53% of the females endorsed the sensitive statement as opposed to 38% in the SRQ and 79% of the males endorsed the sensitive behaviour as opposed to 57% in the FTFI. This was unexpected as the study expected the SRQ to elicit higher responses than the FTFI, but this could be attributed to the rapport that the FTFI generates which may have thus promoted disclosure (Benney, Riesman & Star, 1956; Holbrook, Green & Krosnick, 2003). The FTFI also elicited higher responses than the SRQ on the sensitive statement “I have had unprotected sex with more than one person”. The FTFI elicited higher reporting for both males and females. With 43% of males in the FTFI endorsing the sensitive behaviour as opposed to only 4% in the SRQ and 16% of females in the FTFI endorsing the sensitive statement as opposed to only 8% in the SRQ. These results were found to be insignificant though.

An insignificant result was found for both males and females between the SRQ and FTFI for the sensitive statement “I have had more than one sexual partner”. Here as well the opposite of what was expected was found in that the FTFI elicited higher reporting for both males and females. 35% of the female respondents in the FTFI endorsed the sensitive statement as opposed to 32% in the SRQ and 57% of the males in the FTFI endorsed the sensitive behaviour as opposed to only 6% in the SRQ. The SRQ performed as expected for both males and females for the sensitive statement “I have had multiple partners”. With SRQ eliciting higher reporting as 43% of the female respondents in the SRQ endorsed the sensitive statement as opposed to 21% in the FTFI and 63% of the males endorsed the sensitive behaviour as opposed to 5% in the FTFI. An insignificant result was found for both males and females between the SRQ and FTFI for the sensitive statement “I have had unprotected sex”. With the FTFI eliciting higher reporting for females, as 60% of the females in the FTFI endorsed the sensitive statement as opposed to 46% in the SRQ. The SRQ as expected elicited higher reporting for males as 67% males in the SRQ endorsed the sensitive statement as opposed to 64% in the FTFI.

These indicate just how challenging it is to estimate base rates on sensitive behaviour. The yet the methods yield high base rates on some statements and not on others which makes it difficult to say which method is better than the other. These topics are further complicated by the fact that different elements play a role and influence them to some extent i.e. they are connected to norms (expectations in society), interview effects and social desirability. They are connected to norms in society and these play a role in how people respond in questionnaires. There are certain expectations for males and females in society and again because of gender effects some respondents might respond along with norms in society instead of giving truthful responses. Hence they might either under or over report. These elements are captured when calculating social desirability but the fact is they pose a big challenge to the data collected. Hence the argument is that these are complex topics and pose a challenge in research when collecting data in these areas.

Considering the statements above it becomes very difficult to understand/classify the results found. The study found mixed results in that on some of the sensitive statements the UCT produced negative estimates, on some of the statements the opposite of what was expected was found in that for example SRQ produced higher estimates on some of the sensitive statements than the UCT and the same occurred between the SRQ and FTFI on some of the sensitive statements. Some of the results could have been influenced by interviewer effects and that was not controlled for in this study due to time constraints. Interviewer effects as defined by Davis, Couper, Janz, Caldwell and Resnicow (2010) is measurement error that occur as a result of e.g. a certain characteristic of the interviewer, be it gender or race or age. This could have played a role in participants' responding. Davis *et al.* (2010) argue that research on public health especially is affected by this because its surveys usually specify the target population using socio-demographic qualities and these very same qualities are likely to define some of an interviewer's characteristics. As a result the very same characteristics will affect survey estimates. Flores-Macias and Lawson (2008) argue that as much as interviewers are told to refrain from showing emotions/giving emotional cues, interviewees can still form opinions about the interviewer using cues such as the interviewer's name, the way he/she talks and articulates etc.

According to Fahrney, Uhrig and Kuo (2010) collecting data on sensitive information creates flags about measurement error that occurs as a result of social desirability effects and the tendency of respondents underreporting certain behaviours. They argue that giving responses that are socially desirable can be influenced by the presence of the interviewer as well as by the characteristics of an interviewer. Interviewer effects arise when the questions asked are sensitive and that it is linked with characteristics of the interviewer. This could explain some of the surprising results found in the study in that the research questions asked were sensitive and there was only one interviewer (female, African) collecting the data, hence these could have influenced respondents' responses in one way or another. This is supported by Catania *et al.* (1996) who argue that questions on people's sexuality are sensitive to interviewer gender effects e.g. when asked by an opposite gender interviewer the respondent may feel any of the following emotions, arousal, disgust, embarrassment and as a result may under or over report. Johnson and Moore (1993) argue that characteristics of an interviewer be it gender, race and rapport with respondents are potential sources of non-sampling error in surveys. This however contradicts with Blackbeard and Lindegger's (2007) argument on hegemonic masculinities.

The performance of the UCT was unexpected considering that it is known to produce higher estimates for sensitive behaviour than other data collection methods. It is usually reported to yield significantly higher levels of disclosure than other methods (LaBrie & Earleywine, 2000; Dalton *et al.*, 1994; Wimbush & Dalton, 1997). The argument is that respondents are more likely to disclose their sensitive behaviour in the UCT than other methods because it provides respondents with both confidentiality and anonymity (Dalton, Wimbush & Daily, 1994). This though is not what was found in this study in that the UCT produced negative numbers and it yielded lower levels of disclosure than the SRQ and FTFI on some of the sensitive statements. As discussed the results could have been due to a range of factors such as an inadequate sample size (Glynn, 2010; Tsuchiya *et al.*, 2007), the selection of non-sensitive items in the UCT (Glynn, 2010) and gender effects although the argument is questionable.

Further research needs to be conducted on the UCT to verify its credibility and reliability. For example LaBrie and Earleywine (2000) say that there has to be about 40 to 50

respondents in each of the UCT conditions yet Tsuchiya et al; (2007) argue that when using small sample sizes in the UCT you are likely to get mean differences that are unstable. LaBrie and Earleywine (2000) also argue that randomization needs to be done properly when selecting a sample in the UCT and Chaudhuri and Christofides (2006) argue that a careful selection of distractor items is required if one is to avoid getting negative results. Further research is still needed to explore this technique. The UCT has its inadequacies and those are not acknowledged. When using this method one needs to give careful consideration to the size of the sample used. The wording of the statements need to be clear and the distractors need to be related to the sensitive statement and those should be piloted before the actual study. Overall; statistical measures should be put in place to factor the reliability and validity of the method.

5.4 Research limitations

The first limitation was the size of the sample, this study required a large sample size in that an adequate sample size increases the power of a study. It would also increase the reliability and validity of the study. It would thus be advisable to use a larger sample size for this kind of study. The second issue is that of confidentiality. Some of the respondents answered the questionnaires in groups and the respondents would comment loudly on their responses in ways that others could hear their responses, e.g. amongst a group of friends at the library lawns. This compromised the issue of confidentiality because the respondents that heard the comments might decide to respond the same way as the ones talking aloud. Some of the respondents were also sitting too close to each other, in ways in which they could see each other's responses and as much as it was emphasized that each person should respond according to their own behaviour the researcher could not be able to tell whether the respondents answered similarly on some of the questions because that is genuinely the case or that they copied. This could be resolved by setting a separate time for the answering of questionnaires and thus ensuring that respondents sit far apart from each other.

Some of the questionnaires were spoiled and could not be analyzed because respondents did not answer the questionnaires correctly. It would have been wise if the respondents were asked if they understood the instructions before they commenced with the answering of the questionnaires. Some of the respondents rushed through the questionnaires because they did not have the time to fill in the questionnaires e.g. they had to rush somewhere. Adequate time

should be set aside for the answering of the questionnaires. This will even allow respondents that have questions to be able to ask those questions, and it will give enough time for the purpose of the study to be explained as well as the process of confidentiality and anonymity to be emphasized.

6. CONCLUSION

The study found mixed results. The Unmatched Count Technique did not produce higher base rates than the Self Report Questionnaire and Face to Face Interview on all the sensitive questions as there were instances in which more respondents in the SRQ and FTFI endorsed the sensitive statement than in the UCT. The UCT produced negative numbers and it yielded lower levels of disclosure than the SRQ and FTFI on some of the sensitive statements. The SRQ was expected to elicit higher base rate estimates than the FTFI but instead the study found that the SRQ only elicited higher reporting for one sensitive statement out of five.

No statistically significant results were obtained for differences in disclosure levels of unprotected sex and multiple concurrent partners between the UCT, SRQ and FTFI on most of the questions. The study made clear the challenge of collecting sensitive information. It showed clearly Tourangeau and Yan's (2007) argument that questions on sensitive topics tend to get a high rate of nonresponse or large measurement error. This is quite problematic considering the high rate of HIV in the country. This study has shown that gathering data on sensitive behaviour is a challenge not only because of the shortcomings of data collection methods but also because sensitive behaviour is also influenced by contextual factors. Hence more research is needed in this area to explore ways in which data on sensitive behaviour can be collected accurately.

7. REFERENCES

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8. Appendices

8.1. Appendix 1

UCT Form A Males

Age: _____
 Gender: Male Female
 Race: Black White Coloured Indian
 Year of study (e.g. 1st, 2nd, 3rd): _____

Instructions: Next to each set below place the number that matches the number of items that are true for you and you do not have to specify which items apply to you. For example if only 2 items are true for you in a particular set then place a 2 in the space provided next to the set.

Set 1 _____

I have been to England
 I would consider myself a sports fan
 I have a brother
 I have more than one sister
 I've watched the movie "Jerusalem"

Set 2 _____

I type reasonably well
 I own at least one cell phone
 I have my own vehicle
 I have one or more pets
 I have had more than one sexual partner
 I know what a "conversion" is in rugby

Set 4 _____

I take vitamins almost everyday
 I've read the book "Lord of the files"
 There's a handgun in my house
 I have had unprotected sex
 I've lived outside of South Africa
 I've lived in at least three different provinces

Set 3 _____

I read the local paper almost everyday
 I visit the Library more than once a week
 I usually choose sugar free soft drinks
 I don't smoke cigarettes
 I have more than one child

Set 5 _____

I have been to London
 My shoe size is over 7
 I went to a private high school
 I often watch television late at night
 I like reading the editorial section of the local newspaper

Attitudes Towards Others

Age: _____
 Gender: Male Female
 Race: Black White Coloured Indian
 Year of study (e.g. 1st, 2nd, 3rd): _____

Instructions: Listed below are a few statements about your relationships with others. How much is each statement TRUE or FALSE for you? (circle relevant number)

	Definitely true	Mostly true	Don't know	Mostly false	Definitely false
1. I am always polite, even to people who are unpleasant	1	2	3	4	5
2. There have been occasions when I took advantage of someone	1	2	3	4	5
3. I sometimes try to get even with people rather than forgive and forget	1	2	3	4	5
4. I sometimes feel resentful when I don't get my way	1	2	3	4	5
5. No matter who I'm talking to, I'm always a good listener	1	2	3	4	5

UCT Form A Females

Age: _____
 Gender: Male Female
 Race: Black White Coloured Indian
 Year of study (e.g. 1st, 2nd, 3rd): _____

Instructions: Next to each set below place the number that matches the number of items that are true for you and you do not have to specify which items apply to you. For example if only 2 items are true for you in a particular set then place a 2 in the space provided next to the set.

Set 1 _____
 I have been to England
 I would consider myself a sports fan
 I have a brother
 I have more than one sister
 I've watched the movie "Jerusalem"

Set 2 _____
 I type reasonably well
 I own at least one cell phone
 I have my own vehicle
 I have one or more pets
 I have had more than one sexual partner
 I know what a "conversion" is in rugby

Set 3 _____
 I read the local paper almost everyday
 I visit the Library more than once a week
 I usually choose sugar free soft drinks
 I don't smoke cigarettes
 I have more than one child

Set 4 _____
 I take vitamins almost everyday
 I've read the book "Lord of the files"
 There's a handgun in my house
 I have had unprotected sex
 I've lived outside of South Africa
 I've lived in at least three different provinces

Set 5 _____
 I have been to London
 My shoe size is over 7
 I went to a private high school
 I often watch television late at night
 I like reading the editorial section of the local newspaper

Attitudes Towards Others

Age: _____
 Gender: Male Female
 Race: Black White Coloured Indian
 Year of study (e.g. 1st, 2nd, 3rd): _____

Instructions: Listed below are a few statements about your relationships with others. How much is each statement TRUE or FALSE for you? (circle relevant number)

	Definitely true	Mostly true	Don't know	Mostly false	Definitely false
1. I am always polite, even to people who are unpleasant	1	2	3	4	5
2. There have been occasions when I took advantage of someone	1	2	3	4	5
3. I sometimes try to get even with people rather than forgive and forget	1	2	3	4	5
4. I sometimes feel resentful when I don't get my way	1	2	3	4	5
5. No matter who I'm talking to, I'm always a good listener	1	2	3	4	5

UCT Form B Males

Age: _____
 Gender: Male Female
 Race: Black White Coloured Indian
 Year of study (e.g. 1st, 2nd, 3rd): _____

Instructions: Next to each set below place the number that matches the number of items that are true for you and you do not have to specify which items apply to you. For example if only 2 items are true for you in a particular set then place a 2 in the space provided next to the set.

Set 1 _____
 I have been to England
 I would consider myself a sports fan
 I have a brother
 I have more than one sister
 I am currently sexually active
 I've watched the movie "Jerusalem"

Set 2 _____
 I type reasonably well
 I own at least one cell phone
 I have my own vehicle
 I have one or more pets
 I know what a "conversion" is in rugby

Set 3 _____
 I read the local paper almost everyday
 I visit the Library more than once a week
 I usually choose sugar free soft drinks
 I have had multiple partners
 I don't smoke cigarettes
 I have more than one child

Set 4 _____
 I take vitamins almost everyday
 I've read the book "Lord of the files"
 There's a handgun in my house
 I've lived outside of South Africa
 I've lived in at least three different provinces

Set 5 _____
 I have been to London
 My shoe size is over 7
 I went to a private high school
 I often watch television late at night
 I have had unprotected sex with more than one person
 I like reading the editorial section of the local newspaper

Attitudes Towards Others

Age: _____
 Gender: Male Female
 Race: Black White Coloured Indian
 Year of study (e.g. 1st, 2nd, 3rd): _____

Instructions: Listed below are a few statements about your relationships with others. How much is each statement TRUE or FALSE for you? (circle relevant number)

	Definitely true	Mostly true	Don't know	Mostly false	Definitely false
1. I am always polite, even to people who are unpleasant	1	2	3	4	5
2. There have been occasions when I took advantage of someone	1	2	3	4	5
3. I sometimes try to get even with people rather than forgive and forget	1	2	3	4	5
4. I sometimes feel resentful when I don't get my way	1	2	3	4	5
5. No matter who I'm talking to, I'm always a good listener	1	2	3	4	5

UCT Form B Females

Age: _____
Gender: _____ Male Female
Race: Black White Coloured Indian
Year of study (e.g. 1st, 2nd, 3rd): _____

Instructions: Next to each set below place the number that matches the number of items that are true for you and you do not have to specify which items apply to you. For example if only 2 items are true for you in a particular set then place a 2 in the space provided next to the set.

Set 1 _____

I have been to England
I would consider myself a sports fan
I have a brother
I have more than one sister
I am currently sexually active
I've watched the movie "Jerusalem"

Set 2 _____

I type reasonably well
I own at least one cell phone
I have my own vehicle
I have one or more pets
I know what a "conversion" is in rugby

Set 3 _____

I read the local paper almost everyday
I visit the Library more than once a week
I usually choose sugar free soft drinks
I have had multiple partners
I don't smoke cigarettes
I have more than one child

Set 4 _____

I take vitamins almost everyday
I've read the book "Lord of the files"
There's a handgun in my house
I've lived outside of South Africa
I've lived in at least three different provinces

Set 5 _____

I have been to London
My shoe size is over 7
I went to a private high school
I often watch television late at night
I have had unprotected sex with more than one person
I like reading the editorial section of the local newspaper

Attitudes Towards Others

Age: _____

Gender: Male

Female

Race: Black

White

Coloured

Indian

Year of study (e.g. 1st, 2nd, 3rd): _____

Instructions: Listed below are a few statements about your relationships with others. How much is each statement TRUE or FALSE for you? (circle relevant number)

	Definitely true	Mostly true	Don't know	Mostly false	Definitely false
1. I am always polite, even to people who are unpleasant	1	2	3	4	5
2. There have been occasions when I took advantage of someone	1	2	3	4	5
3. I sometimes try to get even with people rather than forgive and forget	1	2	3	4	5
4. I sometimes feel resentful when I don't get my way	1	2	3	4	5
5. No matter who I'm talking to, I'm always a good listener	1	2	3	4	5

Self-Report Survey Items

Males

Age: _____
 Gender: Male Female
 Race: Black White Coloured Indian
 Year of study (e.g. 1st, 2nd, 3rd): _____

Instructions: next to each question answer either True or False

1. I have been to London _____
2. I have had sex without a condom _____
3. My shoe size is over 7 _____
4. I have had more than one sexual partner _____
5. I went to a private high school _____ -
6. I have had unprotected sex _____
7. I often watch television late at night _____
8. I am currently sexually active _____
9. I like the editorial section of the newspaper _____
10. I have had unprotected sex with more than one person _____
11. I use the internet almost every week _____
12. I've lived outside South Africa _____

Attitudes Towards Others

Age: _____
 Gender: Male Female
 Race: Black White Coloured Indian
 Year of study (e.g. 1st, 2nd, 3rd): _____

Instructions: Listed below are a few statements about your relationships with others. How much is each statement TRUE or FALSE for you? (circle relevant number)

	Definitely true	Mostly true	Don't know	Mostly false	Definitely false
1. I am always polite, even to people who are unpleasant	1	2	3	4	5
2. There have been occasions when I took advantage of someone	1	2	3	4	5
3. I sometimes try to get even with people rather than forgive and forget	1	2	3	4	5
4. I sometimes feel resentful when I don't get my way	1	2	3	4	5
5. No matter who I'm talking to, I'm always a good listener	1	2	3	4	5

Self-Report Survey Items

Females

Age: _____
 Gender: Male Female
 Race: Black White Coloured Indian
 Year of study (e.g. 1st, 2nd, 3rd): _____

Instructions: next to each question answer either True or False

1. I have been to London _____
2. I have had sex without a condom _____
3. My shoe size is over 7 _____
4. I have had more than one sexual partner _____
5. I went to a private high school _____ -
6. I have had unprotected sex _____
7. I often watch television late at night _____
8. I am currently sexually active _____
9. I like the editorial section of the newspaper _____
10. I have had unprotected sex with more than one person _____
11. I use the internet almost every week _____
12. I've lived outside South Africa _____

Attitudes Towards Others

Age: _____
 Gender: Male Female
 Race: Black White Coloured Indian
 Year of study (e.g. 1st, 2nd, 3rd): _____

Instructions: Listed below are a few statements about your relationships with others. How much is each statement TRUE or FALSE for you? (circle relevant number)

	Definitely true	Mostly true	Don't know	Mostly false	Definitely false
1. I am always polite, even to people who are unpleasant	1	2	3	4	5
2. There have been occasions when I took advantage of someone	1	2	3	4	5
3. I sometimes try to get even with people rather than forgive and forget	1	2	3	4	5
4. I sometimes feel resentful when I don't get my way	1	2	3	4	5
5. No matter who I'm talking to, I'm always a good listener	1	2	3	4	5

Face to Face Interview Males

Instructions: next to each question tick either Yes or No

	YES	NO
1. Have you been to England?	1	2
2. Would you consider yourself as a sports fan?	1	2
3. Have you watched the movie “Jerusalem”?	1	2
4. Are you currently sexually active?	1	2
5. Do you type reasonably well?	1	2
6. Do you own at least one cellphone?	1	2
7. Do you know what a “conversion” is in rugby?	1	2
8. Have you had more than one sexual partner?	1	2
9. Do you read the local paper almost everyday?	1	2
10. Do you visit the Library more than once a week?	1	2
11. Do you usually choose sugar free soft drinks?	1	2
12. Have you had unprotected sex?	1	2
13. Do you smoke cigarettes?	1	2
14. Do you have more than one child?	1	2
15. Have you read the book “Lord of the files”?	1	2
16. Have you had multiple partners?	1	2
17. Is there a handgun in your house?	1	2
18. Have you lived outside of South Africa?	1	2
19. Have you lived in at least three different provinces?	1	2
20. Have you had unprotected sex with more than one person?	1	2
21. Have you been to London?	1	2
22. Did you go to a private high school?	1	2
23. Do you often watch television late at night?	1	2
24. Do you like reading the editorial section of the local newspaper?	1	2

Attitudes Towards Others

Age: _____

Gender: Male

Female

Race: Black White Coloured

Indian

Year of study (e.g. 1st, 2nd, 3rd):

Instructions: Listed below are a few statements about your relationships with others. How much is each statement TRUE or FALSE for you? (circle relevant number)

	Definitely true	Mostly true	Don't know	Mostly false	Definitely false
1. I am always polite, even to people who are unpleasant	1	2	3	4	5
2. There have been occasions when I took advantage of someone	1	2	3	4	5
3. I sometimes try to get even with people rather than forgive and forget	1	2	3	4	5
4. I sometimes feel resentful when I don't get my way	1	2	3	4	5
5. No matter who I'm talking to, I'm always a good listener	1	2	3	4	5

Face to Face Interview Females

Instructions: next to each question tick either Yes or No

	YES	NO
1. Have you been to England?	1	2
2. Would you consider yourself as a sports fan?	1	2
3. Have you watched the movie “Jerusalem”?	1	2
4. Are you currently sexually active?	1	2
5. Do you type reasonably well?	1	2
6. Do you own at least one cellphone?	1	2
7. Do you know what a “conversion” is in rugby?	1	2
8. Have you had more than one sexual partner?	1	2
9. Do you read the local paper almost everyday?	1	2
10. Do you visit the Library more than once a week?	1	2
11. Do you usually choose sugar free soft drinks?	1	2
12. Have you had unprotected sex?	1	2
13. Do you smoke cigarettes?	1	2
14. Do you have more than one child?	1	2
15. Have you read the book “Lord of the files”?	1	2
16. Have you had multiple partners?	1	2
17. Is there a handgun in your house?	1	2
18. Have you lived outside of South Africa?	1	2
19. Have you lived in at least three different provinces?	1	2
20. Have you had unprotected sex with more than one person?	1	2
21. Have you been to London?	1	2
22. Did you go to a private high school?	1	2
23. Do you often watch television late at night?	1	2
24. Do you like reading the editorial section of the local newspaper?	1	2

Attitudes Towards Others

Age: _____
 Gender: Male Female
 Race: Black White Coloured Indian

Year of study (e.g. 1st, 2nd, 3rd):

Instructions: Listed below are a few statements about your relationships with others. How much is each statement TRUE or FALSE for you? (circle relevant number)

	Definitely true	Mostly true	Don't know	Mostly false	Definitely false
1. I am always polite, even to people who are unpleasant	1	2	3	4	5
2. There have been occasions when I took advantage of someone	1	2	3	4	5
3. I sometimes try to get even with people rather than forgive and forget	1	2	3	4	5
4. I sometimes feel resentful when I don't get my way	1	2	3	4	5
5. No matter who I'm talking to, I'm always a good listener	1	2	3	4	5

8.2. Appendix 2

Information sheet

I am Neo Matlala, a Research Psychology Masters student from the University of KwaZulu-Natal, Pietermaritzburg campus. My research project involves comparing three methods the Unmatched Count Technique, face to face interview and the Self-report Questionnaire in estimating base rates of sensitive behavior: unprotected sex and concurrent sexual partners. The results of this study might be used in future interventions and campaigns. You have been randomly assigned to answer the Self-report Questionnaire. Please understand that your participation is voluntary and you are not being forced to take part in this study. If you have any other questions about this study or a complaint, you may contact my supervisor Mr. Vernon Solomon by email: Solomon@ukzn.ac.za or call him at 033 260 5680.

8.3. Appendix 3

Informed Consent Form

I hereby agree to participate in research regarding the comparison of the Unmatched Count Technique, face to face interview and the Self-report Questionnaire in estimating base rates of sensitive behaviour: Unprotected sex and concurrent sexual partners. I understand that I am participating freely, and without being forced to do so in any way. I also understand that I can withdraw at any point should I not want to continue, and that this decision will not in any way affect me negatively.

The purpose of this study has been explained to me, and I understand what is expected of my participation.

I have received the telephone numbers of any persons I can contact should I need to speak about any issues that arise.

I understand that this consent form will not be linked to the questionnaire, and that my answers will remain confidential.

Signature of the participant

Date