

The Role of Fathers' Parental Involvement in Female Reproductive Strategies: The Case of Botswana.

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DECLARATION

Submitted in fulfilment / partial fulfilment of the requirements for the degree of
Masters Research Psychology, in University of KwaZulu-Natal, Pietermaritzburg, South
Africa.

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Prof. Lance Lachenicht

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DEDICATION

To all females with unknown and uninvolved fathers.

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To all those who have directly and indirectly supported me in completing this writing, I would like to extend my sincere gratitude...

- To God, for your unmerited favour towards me, you know how much grateful I am.
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Abstract

This study located in Botswana examined if fathers' parental involvement as well as accessibility has any effects on their daughter's reproductive strategies. A sample of 209 females between ages 18 and 56, purposely and conveniently recruited took part in this retrospective survey. The study hypotheses were derived from a body of literature that supported a link between fathers' parental involvement and accessibility in cuing for different female reproductive strategies. The hypotheses were also generated from the Life History Theory which speaks for fathers' parental investment as a main cue for female reproductive strategies choice. Using the Life History Theory, fathers' availability and high father parental involvement was expected to significantly cue for later age at menarche, later sexual debut, later first pregnancies, later first child, stable sexual pair-bonding, less number of offspring as well as high parental investment in female offspring. Thus, a reproductive strategy deemed as slowed. In overall, the Life History Theory was partially supported. Fathers' parental involvement did not significantly predict reproductive strategies in total, rather, some of the reproductive strategies. Early onset of menarche was predicted by low father parental involvement as well as accessibility. Sex debut, age at first pregnancy, age at first child, and parental investment were not significantly predicted by father parental involvement as well as accessibility. Sexual partnering was significantly predicted by total father parental involvement. Total number of offspring was also significantly predicted by total father parental involvement and availability.

Keywords: *Father Parental Involvement, Reproductive Strategies, Menarche, Sexual Debut, Parental Investment, Life History Theory, Evolutionary Psychology*

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The role of father parental involvement on female reproductive strategies: A Botswana study

1 Introduction

1.1 Background

Evolutionary Theory has often been extrapolated to explain a wide range of life and existence issues, and human behavior is not an exception. When it takes this course, it is commonly called evolutionary psychology. Accordingly, it is not surprising that mating and reproduction in humans can also be explained in evolutionary language (Buss, 2004). Organisms that do succeed in reproducing will continue to survive, those that do not will disappear. Therefore, the genes of those that do succeed in reproducing will increase in frequency in the population and the genes of those that do not reproduce will diminish in the population. In order to pass genes to the next generation, the organism must grow to adulthood, support itself, and find a mate. A difficulty here is that time and resources needed for both self-maintenance and reproduction are limited. For instance, an organism may expend effort doing one thing at a time, and thus attaining balance through the principle of Time-allocation, but achieving an optimal balance may be challenging (Gurven & Kaplan, 2006). A balance between undertaking different life tasks has to be attained within a lifetime frame as senescence is inevitable. Life History Theory, a branch of Evolutionary Psychology explains that resources are limited and must be allocated to either maintenance of bodily growth or reproduction, both aimed at survival of an organism by maintaining itself or passing on its genes to the next generation (Buss, 2009). This theory tries to explain the trade-offs between reproduction (reproductive effort), and growth (somatic effort) through self-maintenance. Somatic effort is explained as strategic allocation of energy and resources to maintain fitness of an organism for longer survival whereas reproductive effort is concerned about strategic allocation of an organism's energy and resources in making several copies of its genes for future existence (Workman & Reader, 2004). It is said that, a mediation of trade-offs between somatic and reproductive efforts are needed to nurture ultimate fitness as traits involved in either of the two are mostly opposing each other. For example, diverting energy and resources to maintaining self-fitness may delay reproduction. In extreme cases in other organisms, reproduction may be achieved at the cost of existence. For example, some male spiders allow the female they have mated with to eat them, and thus somatic efforts are ceased for reproduction's sake (Foellmer & Fairbairn, 2003).

Female mammals, humans included, normally invest heavily to ensure that their offspring survive, from gestation until the child is independent enough to leave 'home'. Besides having a female species actively parenting, in the case of humans and other species, it is also often the case that a father also lingers and takes part in developing this new life. Hence, in humans, nuclear family is normally perceived as a model family (Ellis, Bates, Dodge, Fergusson, Horwood, Pettit, & Woodward, 2003). Regardless of this perception on dual parenting or presence of both mother and father in the upbringing of their children, current trends reveal diversities of family structures. Societies around the world have a range of family structure types such as female headed, child headed, foster care, and children under guardian parents. Quite often, where there is single parenting, it is the female who assumes headship rather than the male. Hence father absence or father parental involvement effects on children are worth studying. For that reason, in the current study, the scope of study was mainly focussed on the role of father parental involvement as well as the impact of the father on the female child's reproductive route. There have been many studies on the importance of females in child rearing but only a few studies have focused on studying fathers.

A family unit is the first socialisation unit. If it functions well, it is expected to impact positively on the outcome of the children in the family (e.g. Hunt & Hunt, 1977; Pearson, Muller, & Frisco, 2006). However, the family composition seems to be important in determining how favorable the outcome will be. Around the 1990s, Botswana was reported to have a high rate of female headed families amongst other countries (Garey & Townsend, 1996). According to the recent "Botswana Core Welfare Indicators Survey" (2009/10), more than 45% of families in Botswana were reported to be female-headed, a figure also implying absent father figures in many households. This record on Botswana family headship raises concerns as to whether there is any impact on offspring as implied by previous studies conducted on impact of father absence. Some previous studies revealed negative impacts that follow when children are raised up in female single headed families (e.g. Hill, Leyva, & DelPriore, 2016). These outcomes include but are not limited to high rates of delinquencies, high chances of incarceration, and accelerated reproductive strategies in girls, lower educational achievement and many others (Polit & Kahn, 1986; Ryan, 2015).

More reasons for studying the impact of fathers' involvement and availability on daughters' reproductive strategies lie in that no known study has been documented on the effects of father absence on children in Botswana. Even more, Botswana is one of the countries in the

world that has been hit hard by the HIV/AIDS pandemic. There are several reasons normally offered to explain how HIV transmission has escalated in Botswana. Although the current study scope does not explicitly cover issues of HIV/AIDS, it is well known that the major routes of transmission of this disease are through unprotected sex with an infected partner. Issues of acquisition and spread of HIV/AIDS are related to issues of sexual strategies and partnering. Hence, behavioral change has often been presented as the main relegating factor in the fight against this disease (Allen & Heald, 2004). In trying to find ways to fight the HIV/AIDS, numerous studies have offered numerous approaches to combatting the spread of this disease. It is therefore imperative that the current study's focus touches on sexual partnering and behavior, and how it is potentially affected by father parental involvement.

There are studies focused on the role of father's parental involvement (e.g. Quinlan, 2003; Ellis & Garber, 2000; Dittus, Jaccard, & Gordon, 1995; Cornwell, Smith, Boothroyd, More, Davies, Stirrat, Tiddeman, & Perrette, 2006; Ellis et al., 2003). These studies have pointed out various consequences for children that follow from either a lack of involvement or a complete absence of fathers. Although the father-son relationship has been widely studied, and its importance documented in literature, it has also been noted that the father-daughter relationships have significant effects in development as well (Ellis et al., 2003). For instance, absence of a father in a daughter's life has been observed to be related to earlier puberty, sexual promiscuity, numerous and less stable romantic relationships, and more casual behaviors related to sex and reproduction (Hill, Leyva, & DelPriore, 2016). Positive attributions have been paired with father presence during upbringing (Mendel et al., 2006). For instance, some studies on females reared in father present families have shown these particular females begin to start off sexual involvement later than females in father absent households and they are more likely to choose partners who will invest in them and their offspring (Ellis et al., 2003).

1.1.1 Rationale

As pointed out, father absence cues females for faster reproductive strategies. Where there is acceleration of reproductive strategies, (that is when a child reaches maturity much earlier than expected, engages in sex much earlier than expected, and has first pregnancy and first child much earlier than expected), some psychosocial developmental as well as health problems have been noted. For example, an early puberty is associated with earlier engagement in sexual activities, earlier teenage pregnancies which are also associated with

risks such as higher chances of acquiring breast cancer as well as cervical cancer in the later life, and earlier menopause (Louie, De Sanjose, Diaz, Castellsague, Herrero, Meijer, & Bosch, 2009; Kampert, Whittemore, & Paffenbarger, 1988 as cited in Ellis & Garber, 2000; Udry & Cliquet, 1982). Psychosocially, early maturers have also been observed to be more likely than not to engage in problematic behaviors such as promiscuity and alcohol consumption, in addition, they are more prone to mood disorders than their counterparts (Capi & Moffitt, (1991) as cited in Ellis & Garber, 2000). The desire to ameliorate some of these problems motivates an exploration of factors, such as father absence or lack of parental involvement, that are known to be associated with accelerated sexual strategies.

This study was also worth pursuing as a comparative study to other cultures, such as the Western countries where similar studies were conducted before. Given the high rate of father absent families in Botswana, it is critical to explore on whether such high occurrences of father absence could actually be harming female offspring.

1.1.2 Main Study Objectives

There is no study done on this particular focus of interest in Botswana. Therefore, having considered how father parental involvement as well as accessibility interacts with female reproductive strategies, as explored by the Life History Theory and recorded in past literature, the current research was meant to meet the following objectives:

1. To explore female reproductive pathways in Botswana.
2. To investigate whether fathers' parental involvement and accessibility affects female's reproductive strategies as predicted by the Life History Theory. Father parental involvement is operationalized in terms of monitoring and control, material support and resources rendered by a father to a child. Female reproductive strategies are defined in terms of onset of reproduction, mating choices and parental investment efforts.

2 Review of Literature

2.1 Introduction

The current study explores the role of fathers' parental involvement as well as accessibility on their daughters' reproductive strategies. Reproductive strategies, is a term common in Evolutionary Psychology which is defined as "suits of coevolved anatomical, physiological, and psychological traits designed by natural selection for the optimal allocation of mating and parenting" (Chisholm, Ellison, Evans, Lee, Lieberman, Pavlik, Ryan, Salter, Stini, & Worthman, 1993, p.4). The word "strategy" may imply some act that is consciously arrived at or an act devised in awareness. In the context of evolutionary psychology, however, its use does not imply that the organism needs to be consciously planning its reproductive route (Chisholm et al., 1993).

A variety of mechanisms may be involved when modelling reproductive strategies. When a particular reproductive strategy is chosen, one or more of these mechanisms may be invoked, for example, females may be thought of as copying their mothers' behavior (developmental, Amato, 2000), economic uncertainty (precariousness) that often follows the absence of a father has been linked to female reproductive strategies (economical and psychological) (Chisholm et al., 1993; Drapper & Harpending, 1982). It is possible that genetic predispositions may affect developmental outcome (biological and physiological) (Comings, Muhleman, Johnson, & MacMurray, 2002), and fathers may serve as "cues for canalization of reproductive strategies" (Quinlan, 2003, p. 377). Some authors (Cornwell et al., 2006, p.2143) link particular aspects of reproductive strategies such as first engagement in sexual activities to complex causes like "good parental relationships, especially between girls and their mothers". However, there is strong evidence pointing to fathers' involvement and accessibility as somehow influential in their daughter's reproductive strategies (e.g. Ellis et al., 2003; Mendle et al., 2006). However, there is a debate on whether the mere presence or absence of a father in a girl child's early life is responsible for the reproductive strategy 'turnout', or whether the impact of the father on a child's reproductive strategy is mediated by some other factors that are paired with father presence or absence. For example, some authors, (e.g. Ellis et al., 2003) have claimed that the quality of a father's care is important in determining reproductive development route rather than his mere presence or absence, or even any economic support he provides. And other studies purport advantageous dual parenting by placing daughters at lower risks for accelerated reproductive strategies. When a

father is involved in child rearing, and has a warm relationship with his daughter, and is involved in insuring a positive family environment, the female children are said to reach sexual developmental milestones significantly later than their counterparts (Mendle, Turkheimer, D'Onofrio, Lynch, Emery, Slutske, & Martin, 2006). These claims about a link between fathers and accelerated or delayed reproduction in daughters illustrate the complexity of father parental involvement in females' reproductive strategies.

2.2 General family dynamics and parental involvement

Research in human development has increased significantly in the past decades (Parke, 2004). This increase may be a response to “social shifts” as the family structure is no longer traditional, rather, constantly evolving. There are revolutionised work forces and more mothers are seen as leaving their traditional roles of homemaking and taking up jobs hence the observed shifts in the traditional family structures where men go out to work and women engage in homemaking. Reports of high divorce rates, which leave children in single parent families has also contributed to studying the human development in relation to the family unit. Studying the family unit at one particular point in human history will always presents with a challenge of ‘shifts’ and ‘revolution’ in family set up (Parke, 2004), that is families change. Henceforward, it is important that family life studies are updated from time to time.

Explanations to the manner in which children turn out and the effects of family influences vary widely. Dual parenting has differing effects on children's development as compared to single parenting. It has often been cited as creating a favourable and advantageous family environment. Several reasons are presented as explanations. Some reasons emphasise that compromised parental supervision and monitoring in single parent families is responsible for the adverse developmental outcomes observed in phases of reproduction associated with father absence. Families with two parents are regarded to be at an advantage of more time and resources to invest in children hence the differing favourable outcomes in their daughter's reproductive choice (Quinlan & Flinn, 2003; Quinlan, 2001). Dual parenting is thought to offer economic advantage which places its children at better odds. In contradiction to this claim, other studies have shown no socioeconomic causal effect on female reproductive strategies, which may be a possible reason to rule out the explanation rooted in paternal monetary support (e.g. van Brummen-Girigori & Buunk, 2015). The presence of

both biological parents lowers some negative outcomes associated with adolescents' sexual strategies (e.g. Ellis et al., 2003; Kiernan & Hobcraft, 1997). Oftentimes, some factors such as increased parental involvement in monitoring and control are cited as causal links to desirable sexual strategies outcome. Increased parental involvement is thought to ameliorate the negative sexual strategies route that could possibly be "chosen" (Pearson, Muller, & Frisco, 2006). Nonetheless, other studies reveal that it could also be both the extremes of parenting especially in adolescents; less monitoring and evaluation and much stricter parental discipline methods which would result in accelerated sexual strategy, particularly earlier sexual interactions (Hunt & Hunt, 1977; Longmore, Manning, & Giordano, 2001 as cited in Pearson et al., 2006). As children grow, their parental involvement needs change too. Therefore, a balance between their need for autonomy versus guidance from parents must be carefully readjusted at each developmental stage (Muller, 1998 as cited by Pearson et al., 2006).

2.2.1.1 Fathers' parental involvement effects upon daughters as compared to sons

Even though some opinions do not support families as the socialisation arena for children (e.g. <http://www.scientificamerican.com/article/parents-peers-children/>), many researchers regard a family unit as playing important roles in children's eventual success and shaping later life roles, through socialisation (Hunt & Hunt, 1977). Fathers are sometimes perceived as shaping their children's futures. Traditionally, they are the breadwinners, providing essential economic resources. Hunt and Hunt (1977) mentioned that father absence has differing effects for girls as compared to boys, and even more, these effects differ by race or ethnicity. In their (1997) study, using a sample of American whites and blacks, girls differed according to race, in terms of strategies to development. White females who were brought up in female single headed families were found to be high achievers. These white females were perceived to have a significant push to achieve higher as compared to black girls. Hunt and Hunt (1977) expounded that possibly, growing up in a white female single headed family removes some conventional barriers such as gender stereotypes that affect girls' achievement. Such gender stereotypes are thought to also "weaken sex-role identification" (p. 90). A tentative explanation of this speaks for the white girls' lack of optimism about their future family ever being conventional, and thus they have to prepare for a modified mother role of being both the provider and nurturer. When comparing the black girls to the white girls, the black girls with absent fathers did not display any significant difference to those with fathers, that is higher achievement was not observed in girls with absent fathers. Hunt and Hunt

(1977) explained these racial differences in the following manner. An absent father in black families is a more common phenomenon than in white families. Hence, on the one hand where the white girl with an absent father may experience it as an uncommon family setting, which might motivate her to achieve higher, the black girl child may view father absence as normal due to its frequency of occurrence, hence the difference in terms of how they deal with the situation (Hunt & Hunt, 1977).

2.2.1.2 *Fathers' interaction with children*

Fathers differ from mothers in terms of the nature of interactions they engage in with their children (Lewis & Lamb 2003), and thus, a father's involvement in a child's upbringing must not be studied and measured using the 'motherhood ruler'. As appreciated earlier, deciding on the core effects that a father-daughter relationship can have on reproductive strategies has proven to be a challenging course as there are many other factors to take into account as well as potential confounds. A family is a system, with subsystems. In this regard, Lewis and Lamb (2003) analysed four themes of family interaction and noted that;

(1) Generally, men appear to be less interactive with their children and would generally be less close to their children as compared to mothers, (2) fathers may have diverse specific roles that they play, evident in some cultures where fathers are even viewed as children's playmates, (3) father's play style is predictive of child's later socio-emotional development whereas father's involvement predicts adjustment better than mother's involvement, (4) hence there arises a need for finding appropriate father involvement measures (Lewis & Lamb, 2003 p.211).

Paternal studies reveal diversities of influences in children's development exerted by fathers in two-parent households (Lewis & Lamb, 2003). Noteworthy, father parental involvement may prove challenging to measure especially across cultures.

2.3 Parental involvement

Before narrowing down to a father's parental involvement, it is worth looking at parental involvement broadly. Parental involvement can be categorised in many different ways. Lamb (1986) mentioned three ways; firstly, parental engagement or direct interaction with the child. Secondly, parental accessibility, whereby a parent has direct accessibility but is not actively

involved with the child. Thirdly, parental responsibility such as taking responsibility that is more than helping out. The type of interaction observed in families are that mothers spend more time in interacting with their children than fathers would do. Fathers tend to interact in an active playful manner regardless of whether it be playtime or they actually have to complete a 'serious' task that both parties are engaged in. Mothers would display behaviors that are rather soft and more directed to task completion. These differences are mostly noticeable in two-parent families than in single parented ones.

A child's age is also likely to influence the amount of time both parents spend on it. For instance, babies get more attention and time and as the ages increase, the amount of involvement decreases. There is also a notion that a child's gender affects fathers involvement, it is commonly known that fathers would spend more time with their sons than with their daughters and treat them in gender stereotyped ways. This is not true for mothers as they are observed to treat children in much more equal ways (Phares, 1993).

There are some intriguing factors thought to be indirectly mediating the relationship between parental involvement and girls' reproduction development. Frisco (2005) found that parental involvement in children's education equips daughters with better decision making for birth control even after they have left their homes. The odds of a young woman using contraception to prevent against premarital pregnancies as well as that of choosing more effective contraceptives are somehow increased for girls whose parents were involved in their education management in their formative adolescence (Frisco, 2005). This relationship is not affected by the child's high school success. Thus, it is independent of the child's natural ability to decision making, but that somehow parental involvement in education promotes "planful competencies and management skills... in young women" (Frisco, 2005, p.117) and equips them to deal with reproductive and contraceptive issues better.

2.4 Father parental influence and reproductive strategies

Above, parental involvement was expounded to appreciate the general role of a father. Since the scope of the current study pertains to fathers' parental accessibility and involvement, here, parental involvement is narrowed to the father's influence on his daughter's reproductive strategies. There is voluminous literature aimed at studying the observed relations between a father's parental involvement with different components of female

reproductive strategies such as onset of puberty, sexual partnering, onset of sexual activities, timing of first pregnancies, child bearing and spacing, and parental investment in offspring (Ellis et al., 2006; Kiernan & Hobcraft, 1997; Chisholm et al., 1993; Drapper & Harpending, 1989; Ellis & Garber, 2000; Udry & Cliquet, 1982; Cornwel et al., 2006). Fathers' parental involvement and female reproductive strategies in relation to some components studied before in related studies will be discussed below under the following themes: Father's influence on age at menarche, partnering, first sexual contact, and offspring investment. Furthermore, cultural influences, stepfather versus biological father, mere or physical versus emotional presence, and biological components to the relationship will be looked at.

2.4.1 Father influence on age at menarche

Reaching menarche is an important milestone which marks a developmental stage that readies a girl for subsequent reproduction paths. A relationship between the ages at menarche, first sex, marriage and first birth has often been established (Udry & Cliquet, 1982). The age at menarche is thought to be a "potent variable discriminating age at marriage and age at first birth" (p. 62). Having conducted a cross racial and religious study, Udry and Cliquet (1982) found that age at menarche is a discriminating variable for subsequent reproductive strategies, and that this was true across cultures. They used samples of females across cultures specifically from United States, Belgium, Pakistan, Malaysia, and China. They reasoned that there are some biological and social explanations that link these reproductive developments. Biologically, it is alleged that hormones released during puberty are responsible for increasing libido, hence earlier puberty may lead to sexual intercourse, which may result in earlier pregnancies, and eventually earlier marriages. In addition, early pubertal development makes the girls more fecund earlier than peers and hence they are at greater odds of falling pregnant. Early puberty comes with development of secondary sexual characteristics which plays a role in luring males' attention is a factor leading to early intercourse (Udry & Cliquet, 1982). If menarche timing is proven to set off a certain sequential timing of other reproductive strategies, it is therefore important to understand the associations involved as well as factors at play in relation to its timing.

Biosocial explanations of early menarche posit that poor parenting quality may lead to stress and elevated levels of cortisol in children that in turn may be responsible for earlier sexual maturity (Ellis & Gabber, 2000). Culpin, Heron, Araya and Joinson (2015) conducted a study of links between age at menarche, father absence in early childhood and depressive

symptoms. They found that early age at menarche was one of the 'pathways linking early childhood father absence and depressive symptoms in mid-adolescence' (p.921). Additional support to the biological explanation is offered by the pheromone theory. Women's reproductive functioning can be regulated by pheromones (Stern & McClintock, 1998 in Ellis & Garber, 2000). Where there is no father and the mother partners with unrelated male figures (e.g., stepfathers and mother's dating partners), pheromones of these men are likely play a role in accelerating the girl's reproductive development in order to make her ready for reproduction. This is viewed as a better explanation of earlier experiences of menarche observed in daughters where the biological father is absent, rather than the suggested notion of mere father presence or absence effect on menarche onset. Stepfather presence predicts earlier onset of menarche as compared to biological father's absence (Ellis & Garber, 2000). The length of the period of stepfather involvement correlates with earlier onset of menarches (Mendle et al., 2006). (The stepfather's role in the relations being studied will be expounded in a later section of this thesis). Even so, it is worth noting that in some cases, early menarche has not only been associated with absence of a father figure in early childhood, but also with absence of younger siblings, obesity, as well as the mother's age at menarche (Cornwell et al., 2006, p. 2145). In fact, the mother's age at menarche has been strongly presented as a better predictor of menarche onset as compared to other confounding factors such as socioeconomic factors (Cornwell et al., 2006).

Although biological assertions as well as genes are also said to have some effects on timing of this reproductive stage, some other studies have shown that the environment like family composition has a significant influence as well. One of the environmental influences given much attention in literature, which is also the main variable in the current study, is paternal availability in a girl child's early life. Paternal absence has been associated with earlier age at menarche in girls (e.g. Ellis & Garber, 2000; Ellis, McFadyen-Ketchum, Dodge, Pettit, & Bates, 1999; Udry & Cliquet, 1982).

In a study that examined female reproductive development, Quinlan (2003) obtained results that are not consistent with other findings. Females who were brought up solely by their divorced fathers reached menarche earlier than those brought up by both parents. Similar to females brought up by sole divorced fathers, those brought up by single female parents also reached menarche earlier. This implies that a biological father did not play any role in slowing their girl's reproductive development as there was no significant difference in

daughters timing of menarche, whether they be raised by sole biological father parent or sole biological mother. This account may be supported with Ellis and Garber's (2000) explanation that: it is not merely father's presence that accounts for delayed reproductive development, rather there are other underlying mitigating factors. Possibly these factors may be emerging from dual parenting. Further contradictions to mere father presence as important in predicting early menarche were noted as Quinlan (2003) also found that stepfather presence was not associated with or significantly predictive of accelerated reproductive development. Another study that considered household structures' effects on reproductive strategies revealed little influence of the father on subsequent reproduction; however, household wealth was significantly linked to age of first birth in girls (Quinlan, 2001).

2.4.2 Fathers' parental involvement and daughters' first sexual contact/first coitus

Adolescence is viewed as a sensitive period of development as it is the time at which reproductive strategies begin to surface out. It is believed that sexual debut is a doorstep separating adolescence and adulthood (Pearson, Muller, & Frisco, 2006). Early sexual debut is widely not socially acceptable. It leads to a series of problematic sexual behaviors and outcomes. For instance, adolescents who start sexual engagement early are disadvantaged by their maturity level and are unable to make sound decisions for contraceptives use against both pregnancies and sexually transmitted diseases. Therefore, chances are greater that they are caught up in teenage pregnancies and its associated risks. Furthermore, the younger a mother is for her first child, the more likely she will have unplanned subsequent pregnancies (Polit & Kahn, 1986 as cited in Dittus, Jaccard, & Gordon, 1997). These hastened reproductive development stages may be disturbances to the young generations of women who in their teenage years are trying to establish their careers.

The relationship between sexual debut and parenting styles has been established in past research. Significantly related to the current study objective, daughters' sexual debut has often been related to both parental involvement and also specially to father parental involvement as well as accessibility. For instance, Ryan (2015) studied siblings discordant for age at father departure and found that early father departure led girls to earlier sexual debut while the same was not true for boys. They also proposed that age at first sex was not linked to genetics but rather possibly a link to emotional distress and parental monitoring. By using siblings, their study was meant to probe into the mechanisms responsible for any differences

in the sexual strategy development as in this way; genetics and other environmental covariates were being controlled for. Parental monitoring was pointed as a probable cause of the observed earlier age at first sex. Their study was also designed to attempt explaining mechanisms involved in the link. This was done by 'comparing effects across age at father departure from home' and 'comparing effects across sexual outcomes' (p. 220). Still, there was no clear mechanism that could explain the impact of father absence on sexual debut (Ryan, 2015).

In a broader context on family relationships and how they affect adolescents' sexual decision making, positive parenting is seen as encouraging pro-social behaviors including healthy sexual outcomes. Pearson, Muller and Frisco (2006) approached parental involvement's effects on sexuality using four facets of involvement; (1) shared dinnertime, (2) parent-teen relationships, (3) participation in shared activities, and (4) communication about sexuality. They predicted that families that practice the above mentioned facets were more likely to bring about delayed sexual debut. They also predicted that traditional nuclear families with both biological parents involved were more likely to influence a delayed first sexual experience. They used USA nationally representative data that was surveyed from students in grade 7 through 12 drawn randomly from high schools. The study revealed that living with both biological parents posed less chance for an adolescent to initiate first sex. Concerning the four facets of parental involvement explored, adolescents from white families who had more shared dinnertime with parents had delayed first sex. They attributed these outcomes of delayed first sex engagement to the kind of needed structure to the household that is experienced through shared dinnertimes. However, this facet of parental involvement style was found to be unlinked to sexual debut in African Americans, thus the parental involvement influence outcome here is observed as culturally affected. Also supporting their hypothesis, parent-teen relations were seen as factors that significantly reduce chances for sexual initiation in whites. Pearson, Muller and Frisco (2006) explained that the positive parent-teen relationships influence adolescents to view their parent's beliefs as important; hence they adhere to follow the same. Communication about sexuality was not associated with a decrease in sex initiation, tentative reasons to this outcome were that parents who actually engage in communication about sexuality may have been prompted by some sensing that their teenagers have already started engaging in sex, hence those who engage in the this kind of communication were not found at the better odds of not engaging in sex earlier than

their counterparts. Overall, besides these aspects differing by gender and ethnicity or racially, they reveal a positive aspect that comes along with positive parenting.

Refocusing to studies similar to the current study objectives, Ellis et al. (2003, p.801) conducted a longitudinal study on “the impact of father absence on early sexual activity and teenage pregnancy.” They followed a cohort of girls from age five to 18 years in two countries and observed some strong evidence that father absence had more effects on earlier sexual activity as well as teenage pregnancy than on other behavioral, mental health problems, and educational achievement. The strength of their findings lay in having data from diverse nations, and having performed independent tests to their hypotheses, making the findings more generalizable. Some of the theories under test here were the life-course adversity, evolutionary, and social learning models. Their findings revealed that the effects of father absence on daughters “operates independently of life course adversity as well as go beyond mere continuation of early conduct problems” (Ellis et al., 2003, p.815).

To offer a psychological explanation to the observed phenomenon, Ellis et al. (2003) assert that when a father is absent, this could possibly lead to daughters becoming acquainted with their mother's partnering and dating behaviors which in turn may possibly influence the daughter's sexual behaviors leading to early sexual experiences, teenage pregnancy, and promiscuous behaviors. Furthermore, it is possible that the quality of a father's investment may consequently have some implications on daughter's sexuality. A father may be responsible for some relevant processes that occur in families, associated with girl child's reproductive development. Explaining this evolutionarily, girls who experience father absence may develop distrust in men, thinking them as unpredictable and unimportant. This may possibly lead them to develop “manners that accelerates onset of sexual activity and reproduction, reduces reticence in forming sexual relationships, and orients the individual towards relatively unstable pair bonds” (Ellis et al., 2000 p.817). In a similar study, Ellis and his colleagues (1999) had earlier found that father-daughter relationship was more predictive of physical maturation than the mother-daughter relationship.

Flouri and Buchanan (2003) also observed a significant relationship between father involvement and early sexual activities but not on later mental health. Early sexual experiences were observed to be affected by paternal presence or absence timing in daughter's development. Still on paternal involvement timing, Hetherington (1972) was one

of the first to observe that females who did not have their fathers present from birth to age five were more likely to initiate male contact and attention than those whose fathers were not present later in life. Father parental separation period between age one and five has been noted as crucial in reproductive development of girls, a later separation in adolescence has been often endorsed as a predictor of number of sexual partnering (Quinlan, 2003; Drapper & Harpending, 1982).

Van Brummen-Girigori and Buunk (2015) also conducted a study that examined the consequences of father abandonment on Curacao girls' reproductive strategies. The sample was split into early father absence (from age 0 to 5), and late father absence (from age 6 to 13). Results from this study were consistent with the Drapper and Harpending (1982) study as it showed that early father abandonment consequently predicted early sex debut while late father abandonment and father presence did not have any significant effects on sexual debut. Furthermore, these early father abandoned girls had less interest in getting married as well as having grandchildren when asked. These findings were important in such that they showed similar results to studies across other cultures like the USA. Moreover, other possible confounding variables such as educational level and parents' occupational levels were ruled out as potential influences. By ruling out financial stability in the home as well as educational level, early sexual debut was seen as the result of father absence, making the study a significant contribution to the life history theory as it showed father absence cues for accelerated strategies. Another study that showed importance of timing of father absence was done by Quinlan (2003). Separation of daughters and fathers from birth to age five was found to be a significant predictor of reproductive development particularly age at menarche, first sex, first child and duration in marriages. However, some studies do not show any significant effect of the time at which fathers leave homes to girl's sexual behaviors (e.g. McLanahan, 1999).

There are deviant findings to the parental influences on sexual debut, attributing sexual behaviors to the mother's parenting style rather than the father absence. This was found in populations of African Americans and Latino adolescents compared to their white counterparts (Miller, Benson, & Galbraith, 2001, as cited in Pearson et al., 2006).

2.4.3 Fathers' involvement and availability and ages at pregnancy and childbirth

Ellis et al. (2003) found that father absence placed the father's girl child at higher risks for teenage pregnancies. Their study was conducted in two different nations, the US and New Zealand and this was true for both these cultures. The girls were categorised into 3 different sets of father absence; early father absence, late father absent, and father present girls. As anticipated, the results revealed that early father absence put girls at a higher risk for both early sex activities and teenage pregnancies: followed by late onset of father presence and with lesser effects on father present girls. In terms of rates of teenage pregnancies, for early father absent girls, the rates of early teenage pregnancies were predicted at 7 to 8 times more than for father present girls, while for late father absence, they were 2 to 3 times higher than for father present girls. These rates predicting teenage pregnancies for these 3 different categories of father absence were thought as important as they indicated the importance of fathers in predicting teenage pregnancies. According to Quinlan (2003), Ellis et al.'s 2003 study findings were consistent with hypotheses that reproductive development would differ due to differing levels of parental care received from single parenting and dual parenting. Other hypotheses stated that "social learning may account for developmental differences as father absent girls model their mothers' sexual behaviors" and also that "reproductive strategies may be inheritable" (Quinlan, 2003, p.385). Quinlan (2003) also found that parental separation in early childhood was predictive of early pregnancies and other reproductive paths timing. They prove that this relationship was not mitigated by other potential covariates such as disadvantaged family environments

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2.4.4 Fathers' involvement and availability and sexual partnering

Responsible sexual behaviors in female adolescents are linked to their relationships with their fathers (Bowling & Werner-Wilson, 2000). Father parental involvement, father-daughter communications on issues of sexuality and marriage, as well as encouraging androgynous behaviors in daughters, placed adolescents at more responsible sexual behaviors (Bowling & Werner-Wilson, 2000). Men are said to be more interested in casual sex than females (Oliver & Hyder, 1993 as referred by Mikach & Bailey, 1999). As a way of finding out why some women engage in casual sex, Mikach & Bailey (1999) conducted a study on women's sexuality in order to find out if women who are socio-sexually unrestricted, that is those who engage in casual sex, do so due to past stressful familial environments, or because they have low mate value, or because they possess some male characteristics. They found that women who preferred a more casual approach to sex had elevated masculinity but were not in any

way significantly different in mate value as well as recalling upbringing in a disadvantageous family background.

2.5 Different dimensions of father-absence and their effects on females' reproductive strategies

Father absence can arise in many ways such as the death of a father, divorced parents, labor migrant fathers, and others. These father-absence reasons are often cited as having significant differing effect on the child. For instance, Hainline and Feig (1978) found that daughters whose fathers were absent due to death had different views on the acceptability of sexual behaviors in that they had stricter views as compared to those whose fathers were absent due to divorce. Daughters from divorced families are more likely to engage in first sex earlier (Kiernan & Hobcraft, 1997).

2.5.1 Father absence due to death or divorce

In replicating the Hetherington's 1972 study on 'effects of father absence on personality development in adolescent daughters, Hainline and Feig (1978) conducted a similar study with minimal differences to the former in terms of design. A sample of college-aged women with either early or late father-absence due to reasons of either death or divorce showed few differences in terms of personality as compared to the control group from intact families. These father-absent college-aged women showed no significant difference to the control in terms of how they behave towards males as measured during interviews with males. Hainline and Feig (1978) also mentioned that their study was not only incongruent with Hetherington's 1972 study but also with other findings in the literature. They mentioned several reasons that may account to the incongruences such as the age of participants, their race, different locations as well as cultural and religious effects.

2.5.2 Stepfather in the household

Girls who live with a step father are at risk of early indulgence in sexual activities as well as, consequently, early pregnancies according to Ryan (2015). When Ryan (2015) studied father abandoned girls who either had a stepfather or not, her findings revealed that stepfather presence has some effects on the reproductive timing of the girls, particularly the age at first sex engagement. Father abandoned girls who had no stepfathers in-residence were slightly more likely to engage in first sex earlier than those exposed to stepfathers. They explained

that the stepfather may be responsible for monitoring the child hence the significantly increased age at first sex. It is worth noting that the only significant difference in sexual strategies between these two groups of girls was noted for age at first sex, while other sexual strategies, specifically the age at menarche, sexual partnering, desire to get married and desire to have grandchildren showed no significant differences (Ryan, 2015).

Upon testing the evolutionary model of individual differences in pubertal timing, proposed by Belsky et al. (1999), Ellis and Garber (2000) examined “antecedents of variation in pubertal timing among adolescent girls” (p. 458). Their study supported the model which posits that a mother's psychopathological history predicts pubertal timing and that discordant families and father absence as well as stepfather presence is a mediator to this relationship. Intriguingly, the study findings revealed that a mother's involvement with an unrelated male mediated dyadic stress and pubertal timing “such that greater dyadic stress predicted earlier pubertal maturation” (p. 497). However, in cases where the biological father was the mother's romantic partner, dyadic stress was unrelated to pubertal timing.

Furthermore, the timing at which a mother's male romantic partner unrelated to the daughter moved into the daughter's life was more predictive of early pubertal maturation than the actual timing for the biological father's departure. This shows a potential maturation regulation from an unrelated male than from a biological father. This observation can also be seen in other animal mammalian species where unrelated male species' pheromones are the explanation for hastened maturation. In such cases, this hastened maturation is thought to be directed to preparing the younger female to mating with these unrelated males. This could also be a possible reason as to why divorces accelerate pubertal maturation. When the biological father leaves, the daughter remains potentially exposed to pheromones of their mother's partners who are unrelated males, explained by the pheromone theory (Ellis & Garber, 2000).

When stepfathers are thought to influence a hastened pubertal timing, we expect that there will be an automatic follow-up of accelerated reproductive strategies such as earlier initiation of sex, earlier births, high number of offspring, and possibly unstable partnering facilitated by the features associated with early pubertal maturation. This may serve as a handy reason to assume that age at menarche is somehow a factor controlling the subsequent reproductive

strategies. Early menarches will likely lead to earlier dating and eventually earlier sexual initiation.

2.5.3 Physical presence versus emotional and financial presence

Fathers' physical presence or absence in the household has been largely studied. However, some approaches to father-girl child dyad investigate fathers' emotional presence or absence. Shavelsky (2008, p.89) investigated "the impact of paternal emotional absence as perceived by daughters from intact families on the past and present sexual behaviors of females between the ages of 18 and 23". Results revealed a significant difference between females with emotionally involved fathers and emotionally uninvolved fathers. Those with emotionally uninvolved fathers were more likely to engage in earlier risky sexual behaviors as compared to those whose fathers were emotionally involved.

In a longitudinal study by Ellis et al. (1999) where they tested the evolutionary model posited by Belsky, Steinberg, and Drapper (1991), it was found that a father's mere presence had varying dimensions that yielded different predictions of the girl child's pubertal maturation. They measured relationships such as the quality of the family unit relationship, parental investment, mother effects and father effects in relation to the daughter's menarche age. The results showed that beyond the mere presence of a father predicting a later pubertal timing onset as often observed in other studies lie more dimensions such as positive family environment explicated by supportive parenting, more father-daughter affection, and more mother-daughter affection. The quality of family relationships, which is lacking in the absence of a father, is sometimes viewed as a factor at play when girls reach their menarche. What is often referred to in literature as 'effects' of father- absence may not be precise as these may only be correlates of father absence (Hainline & Feig, 1978).

2.6 Cultural influences

Some studies suggest that culture could influence reproduction (e.g. Quinlan, 2003). Also, culture has often been used to explain the increased hazards of first sex and first pregnancy in African American as compared to their counterparts which was presented in a study where Quinlan (2003) was investigating female's reproductive development in United States of America. Parental separation was related to reproductive development. African Americans

were observed to have increased hazards of first pregnancy and sex as compared to whites and Hispanics.

In a study that explored connections among race, pubertal timing, and sex in teenage mothers' offspring, a significant three way interaction on the effects of race, sex and pubertal timing on early sexual intercourse was found. Early sexual engagement in girls was seen to be inversely related to pubertal development. However, a significantly decreased risk in timing of pubertal maturation was only observed in black female offspring. Early maturing in whites was observed to be a significantly higher risk factor of earlier sexual activities as compared to early maturing in Blacks. Thus pubertal maturation was endorsed as a better predictor on timing of sexual activities in white girls than in blacks. There is a possible reproductive pathway that is influenced by intergenerational risk. Teenage mothers' offspring are at a risk of early reproductive development imitating their mothers' habits (De Genna, Larkby & Cornelius, 2011).

2.7 Biological explanations

In offering an alternate explanation to Belsky et al.'s (1991) evolutionary theory of socialization which explains the father absence and effects on daughter's age at menarche, Comings et al. (2002) proposed a genetic explanation. The contention behind the study was on the lack for mechanism that explains how age at menarche could be affected by a father absent environment, which seems more sophisticated than other accelerated reproductive strategies such as multiple partnering, onsets of sexual intercourse, and child spacing which seemed more behavioral. Furthermore, these father absence's associated outcomes in daughters, which are reproductive in nature do not present in sons. These findings therefore offer some grounds for thinking of the relationship in terms of X-linked genetics. Comings et al. (2002) posit that fathers who are most likely to leave their families as well as those who create a negative family environment possess an X-linked gene called the AG gene. The AG gene is thought to be only passed to their daughters but not sons. This gene was found present in men with behaviors that are more consistent with the negative behaviors which include but are not limited to tendencies to be absent from their families and if present, creating a negative family environment such as fighting and abuse. Where the AG gene was found in females, they were more likely to have experienced early maturation, especially onset of puberty. This makes a strong linkage of this gene to the father-daughter relationship and its

effects on the reproductive strategies. Possibly, the AG gene presence or its absence could offer explanations to most of the observed relationship between paternal involvement and reproductive strategies if not for all of the reproductive strategies 'chosen'. The AG gene and its potential effects on reproductive strategies could also be used to explain why Quinlan's 2003 study did not yield consistent results with other findings. Quinlan (2003) had found that biological paternal presence of a divorced father was not marked with later pubertal maturation in their daughters. Using the x-linked AG gene explanation, it could be that divorced fathers are so divorced because they are more likely to possess the AG gene, consequently having negatively affected their romantic relationships. They pass this gene to their daughters hence their daughters develop reproductive strategies similar to girls with absent fathers.

Furthermore, other studies such as twin studies provide stronger evidence for genetics having control over age at menarche (Rowe, 2000 as cited by Comings et al., 2002). When a father is absent due to death, the expected maturation outcomes in the affected daughters are not observed as consistent with those whose fathers are absent. This provides substantial evidence to assume that maturation is more genetically influenced, especially X-linked, rather than thought of as part of the unexplained effects of father absence on the daughter (Comings et al., 2002).

3 Theoretical framework

3.1 Life History Theory

3.2 Trade-off between present and future reproduction

An organism may choose to expend energy in current survival by engaging in life sustaining activities such as concentrating on feeding for repair, and self-protection from predators etc. “Through *maintenance*, organisms repair somatic tissue, allocate energy to immune function, engage in further energy production, and so on” (Kaplan & Gangsted, 2005 p.6). Thus reproduction is spared for the future, growth is maximized and the organism remains fit for future reproduction. Alternatively, an organism may choose to expend energy in reproducing earlier which diverts its fitness to offspring production. If there are higher risks of death or unpredictability of life, the benefit of reproducing later is diminished as self-maintenance will lead to a waste. These two extremes of present versus future reproduction are a continuum and often explained using the Differential-K continuum to be discussed later. If one ‘chooses’ to reproduce early, the chances of self-maintenance and reproducing later are minimized (Kaplan & Gangsted, 2005).

3.3 Trade-off between quality and quantity

This is a trade-off between numbers of offspring and having a few quality offspring. Since resources are finite, budgeting for resources expenditure directs one to either have a small number of offspring where high quality care or parental effort can be accomplished, or more offspring or high quantity where quality will be compromised. Each additional offspring means fewer resources are available for sharing amongst them; hence the quality of parental investment is compromised. In essence, the fewer the offspring produced, the better the quality of care employed to them and the higher their survival chance; and the more the offspring produced, that is the larger the quantity, the less the parental investment as each benefit comes from the limited amount of resources, and also the less the quality of parental investment employed (Kaplan & Gangsted, 2005). However, reaching a balance here is seemingly dependent on how predictable the environment is as well as life expectancy. Having a small number of kin in an unpredictable environment or when life expectancy is short is obviously not a wise trade-off or allocation of resources.

3.4 The trade-off between mating effort and parental effort

Investment in mating lessens the energy an organism can invest in parenting. For instance, mating efforts include costly displays that will limit time and resources needed for parental investment. Females are more likely to mate with 'quality genes'. Those who engage in mating expend much time and resources in it, and less in parental efforts (Kaplan & Gangsted, 2005).

3.4.1 The rK continuum

The rK-continuum is proposed in Life History Theory. This represents strategies continuum ranging from the extreme r to the extreme K which attempts to explain reproductive patterns. The r-selection and K-selection were first coined by McAurthur and Wilson (1967) in species selection within temperate and tropical setting, however, it has been applied to understanding a wide range of developmental differences between species as well as to within species differences (e.g. Figueredo A. J., Vásquez, Brumbach, Sefcek, Kirsner, & Jacobs, 2005). Either end of the strategies in this continuum is not species specific; hence we cannot expect to find a clear cut strategy that fits one particular species. As a result, even in humans, who are more K-selected, a further continuum is defined by the Differential-K. The r-selection is concerned about production whereas K-selection is concerned about efficiency. The r-selection can be likened to quantitative and the K-selection to qualitative (Pianka, 1970).

The r-selection is explained as a strategy whereby energy and matter are channeled to reproduction over bodily maintenance. Consequently, resources are shared by a large number of offspring since numerous offspring are produced. Everything else being equal, the extremes of r-selection normally correlate with the following; an unpredictable or uncertain environment, non-directed and catastrophic deaths, rapid development, early reproduction, small body size, and a production of several offspring in a single reproduction event (Pianka, 1970).

The K-selection strategy is used when an environment is saturated with kin. This is because limited resources will be best distributed within a small number of kin for optimum fitness that will favor future reproduction. Therefore, the overall strategy used for fitness is to produce and maintain a small number of fit offspring, so as to increase chances of survival. The K-selection is more favored by natural selection, the extremes of K-selection often

correlates with the following: a fairly predictable or certain environment, mortality is more density dependent, the organisms are usually engaged in intra and inter specific competition, slow development, delayed reproduction, and larger body size (Pianka, 1970).

The r-K continuum is normally used in comparing species reproductive strategies. Some species are more K-selected and others are more r-selected. However, differing continuum in strategies for fitness is also observed within species. In humans, Figueredo (a) et al. (2005) identified a latent single common factor denoted as K factor which they discovered from individual differences using the life history strategies. The K factor appears to be of great importance in terms of variations in human development. The K-factor was identified as underpinning a variety of parameters of life history.

Humans are said to be highly K-selected as they exhibit slow maturation, they usually give birth to mostly one offspring at a time that have a higher chance of survival. However, within humans, there is substantial variation in reproductive strategies that cannot be ignored. 'Differential-K' was coined to expound these variations (Figueredo, Sefcek, Vasquez, Brumbach, King, & Jacobs, (2005). For example, variations in strategies adopted for reproduction can range from a lower end of the Differential-K to the extreme end. Clustering toward the lower end of the Differential-K will be characterized by choice of short term gains over long term gains. The lower end is clustered with multiple partnering, low parental investments on the kin, early maturity etc. It has been observed that there are also some psychosocial characteristics that manifest in the low Differential-K which are explicated by short term planning, impulsivity, promiscuity, delinquency, extensive risk taking, low female parental support and little paternal support (Figueredo (b) et al., 2005). At the other extreme of the Differential-K, there is long term consideration, selective mating and high parental investment in the kin. Some psychosocial characteristics clustering around this include "extensive parental investment, substantial social support structures, adherence to social rules and careful consideration of risks" (p.246). Modern societies appear to embrace the higher-K strategies as acceptable and lower-K as not desirable. Perhaps this is so because the correlates clustering at the higher-K end which are more long term considered and carefully thought, rendering them more efficient and favored by natural selection than the lower-K.

3.5 Expected results in light with the theory

In view of the Life History Theory, an overall proposition put forward that: father parental involvement will affect how females 'select' a reproductive strategy following the Differential-K. Females who experienced none or low paternal involvement in their upbringing are expected to display reproductive strategies consistent with the lower-K selection, whereas their counterparts will display reproductive strategies consistent with the higher-K selection. Given that the extreme lower end of the Differential-K is consistent with strategies selected by an unpredictable environment, an uninvolved paternal figure is hypothesized to potentially create such an environment that will affect a girl's future reproductive strategies such as age at menarche, partnering, mating, and parental effort. A disparaged or belittled strategy to reproduction can be viewed as a response or adaptation to a lived reality of male unpredictability imprinted in a female's past childhood. Below are some propositions that were derived from the Life History Theory which forms the basis for the current study.

3.5.1.1 Proposition 1-The overall rate and phases of sexual maturation in females will be critically linked to father's parental involvement.

That is, we expect fast life history especially reproduction for females who have experienced less paternal involvement and accessibility, and a slowed reproduction for those who have had higher paternal involvement and accessibility. The way they allocate resources will be cued on the predictability of the environment imprinted in the childhood experiences explained by father availability and involvement.

3.5.1.2 Proposition 2 –Age at menarche is related to father parental involvement. The lesser the father parental involvement, the more likely the girl child will reach menarche earlier. Also, where a father is absent, early menarche is more likely.

Previous studies revealed that females with uninvolved fathers reach maturity earlier than their father-involved counterparts (Ellis *et al.*, 2003; Drapper & Harpending, 1982). This makes them ready for reproduction sooner than their peers brought up in father involved households. Although it cannot be clearly accounted for, Life History Theory also predicts a fast life history for a female who did not experience paternal involvement. The body is readied for fast reproduction so as to attain maximum fitness. When a father is uninvolved or

absent, the daughters cue for male of the species being unpredictable. The male figure's availability throughout the lifespan for mating and expending parental effort is seemingly unpredictable. Therefore, rapid development is 'chosen' as the energy is channeled to current reproduction over bodily maintenances and thus we expect earlier menarche.

3.5.1.3 Proposition 3 –Sexual debut is related to total father parental involvement. The lesser the father parental involvement, the more likely the female child will start sex earlier than their counterparts. Also, females with absent fathers are likely to engage in earlier onset of sexual activities than those brought up with fathers present.

We predicted that females who were reared in families that did not experience paternal involvement would engage in earlier onset of sexual activities, also extending from the expected fast life history. The absence of or less paternal involvement in upbringing is an unpredictable environment with regards to a male's availability. This may influence a girl child to develop reproductive cues that are consistent with accelerating reproduction. They trade off future reproduction to current reproduction as the future seems unpredictable to invest in. This comes through discounting from future fitness and expending energies to current reproduction as it seems more a sound allocation of resources.

3.5.1.4 Proposition 4–Age at first pregnancy and first child bearing is related to total father parental involvement. The lesser the father parental involvement, the more likely the female offspring will have earlier first pregnancies and the younger they will be at the birth of their first child than their counterparts. Also, females with absent fathers are likely to engage in earlier onset of sexual activities than those brought up with fathers present.

Similarly, presented with a trade-off between reproductions versus self-maintenance, females who did not experience paternal involvement will be expected to reproduce earlier than their counterparts as they trade off their bodily maintenance to reproduction. This is a fitness cue imprinted by their past experience of absent fathers. They are likely to view suitors as unpredictable, and that suitors may leave at any point. Therefore, they invest in reproducing earlier rather than in self-maintenance for future reproductions.

3.5.1.5 *Proposition 5 –Sexual partnering is related to total father parental involvement. The lesser the father parental involvement, the more likely the female offspring will engage with multiple sex partners as compared to their father-involved counterparts. Also, females with absent fathers are more likely to engage in sexual relations with multiple sexual partners than those brought up with their fathers present.*

When girls grow up with just one parent, girls develop cues that make them consider male availability as unpredictable. Thus, at pair bonding stage they will likely not commit in their sexual relationships, rather they would engage in multiple partnering. In this way, they are strategically allocating their energies to attachment with several sexual partners, since men are very unpredictable according to their views. Girls possibly also watch their mothers pairing habits and internalize this as the 'way' to pair bonding hence they end up in multiple partnering relationships.

3.5.1.6 *Proposition 6 –Female parental effort is related to their total father parental involvement. The lesser the father's parental involvement, the more likely his female offspring will have many more offspring than their father-involved counterparts. But their investment in each child will be smaller than that of father-involved daughters. Also, females with absent fathers are likely to have several offspring as compared to those brought up in father-present homes.*

This is explicated by a trade-off between mating efforts and parental efforts. Available resources are diverted to luring males. This expenditure discounts from the same source, which means that resources diverted to mating creates a deficit for investing in parental efforts. Here parental effort can be measured in terms of length in breastfeeding and child spacing and the total number of children born. A typical example is observed in the choice between longer breastfeeding periods versus early weaning. Longer breastfeeding periods characterize maximum parental effort on one kin at a time and shorter breastfeeding periods characterize diverting resources to mating and consequently more offspring and less parental care.

3.5.2 Conceptual map of the study

Figure 1 is a conceptualization of the current study using the Life History Theory. The Differential- K is shown from the lower left end where we have low parental involvement or father absence. The higher right hand is characterized by father presence and high paternal involvement. The left hand side is characterized with accelerated reproductive strategies while the right hand is characterized by slowed reproductive strategies.

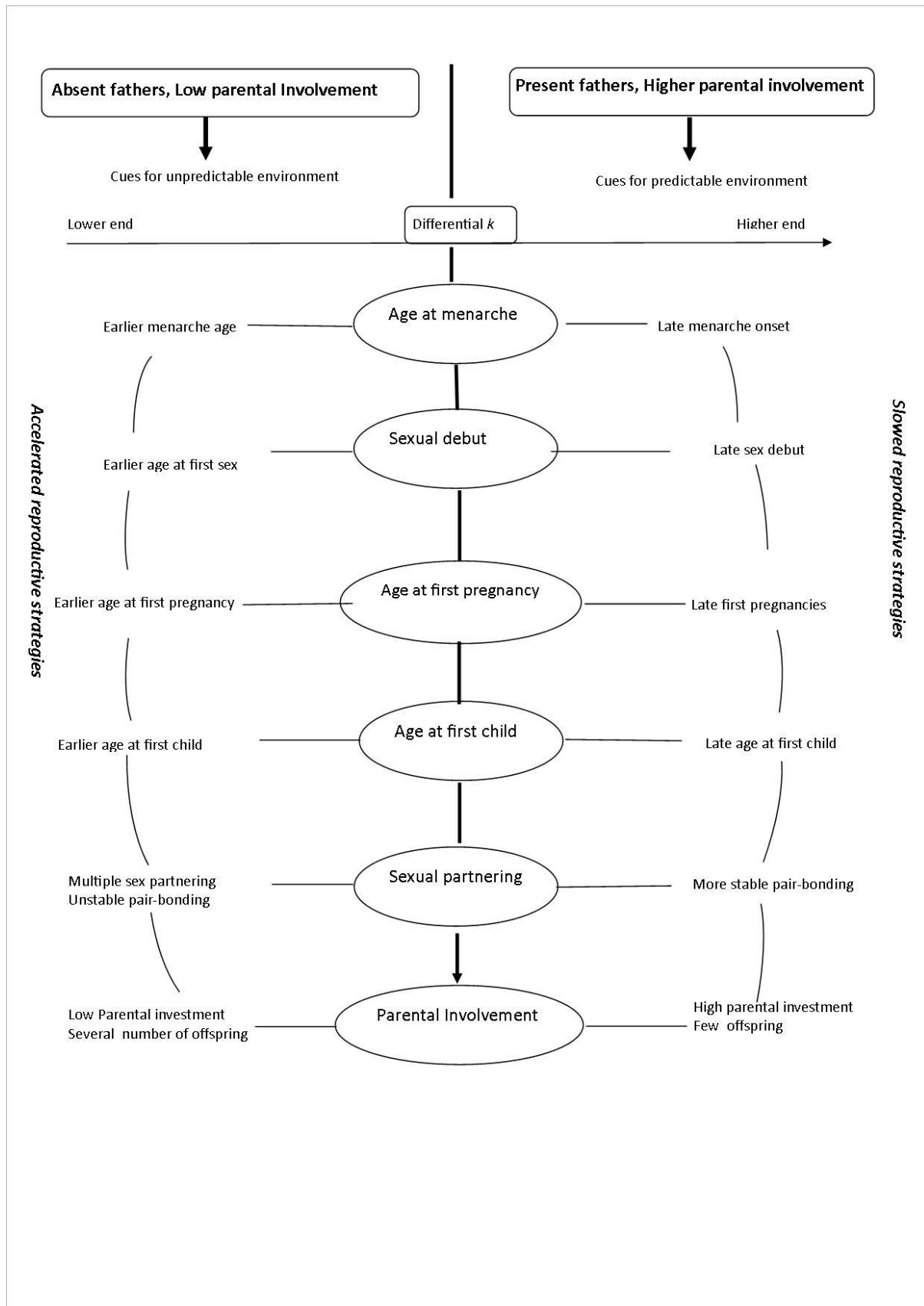


Figure 1: Conceptual map of the study.

4 Methodology

4.1 Introduction

This chapter will narrate how this study was conducted. Participant sampling will be explained as well as their demographics. The research design, how data was collected, and the independent and dependent variables will be explained. Furthermore, the measure used to collect data and how it was constructed will also be explained. The study analysis plan will be laid out, for both the descriptive measures and inferential measures used to test the study hypotheses.

4.2 Objectives of the study

Families are dynamic. There are changes in fertility rates as families become smaller in sizes and compositions, new parenthood timing has changed, women have joined the workforce and divorce rates have also escalated (Parke, 2004). Gender roles are constantly being redefined, Westernization of African families is sometimes observed. Botswana is not an exception to these 'shifts'. These 'shifts' offer opportunities for researchers to explore new adaptations of family systems as well as staying up to date with current affairs of the family systems. Most studies of the father-daughter-relationship and of the impact of father absence on reproductive strategies were conducted in Western cultures. The often studied Western families may not necessarily be similar to the African ones, particularly the Botswana setting. Hence, this study was conducted in Botswana in order to find out if there is any difference in the way a father's parental involvement may affect the daughter's reproductive strategies.

The main objectives of this study are:

3. To explore possible female reproductive pathways or strategies in Botswana.
4. To investigate whether fathers' parental involvement affects females' reproductive strategies as predicted by the Life-history model. Fathers' parental involvement was operationalized in terms of support, monitoring, control, and resources rendered by a father to a child. The female reproductive strategies were defined in terms of onset of reproduction, mating choices and parental investment efforts.

4.3 Main research questions

The following were the main research questions that guided the study:

1. What are the female reproductive strategies trends observed in Botswana?
2. Does a father's absence have effect on a daughter's reproductive strategy?
3. How do the different forms of father parental involvement (monitoring and control, support and material resources) relate with the different of female reproductive strategies categories (mating choice, onset of reproduction and parental effort)?

4.4 Study design

The current study employed a quantitative approach. In answering the research questions, a few of exploratory question on reproductive strategy routes in Botswana were posed. In particular, age at menarche, age at first sex, sexual partnering, age at first pregnancy and first birth, child spacing, parental investment in terms of length of breastfeeding time were explored. In another way the samples of females obtained were allocated into categories; those whose fathers were present during childhood and those whose fathers were absent at childhood. Comparisons were made on these groupings with respect to age at menarche, mating choice, onset of reproduction and parental efforts (length in breastfeeding). In another approach, the study did not only look at father accessibility by marking them as present or absent only. Comparisons also tapped into total father parental involvement measured in a multiple item scale named the Father Parental Involvement Scale, which was part of the questionnaire (See Appendix 1). This scale measured father parental support, monitoring, resources, and control. These forms of father parental involvement were tested to see if they could predict and reproductive strategies such as age at menarche, sex debut, partnering, age at first pregnancy and at first birth and parental investment. More father-daughter relationships such as the biological versus stepfather presence, other present male figures in childhood other than father and the three components of reproductive strategies were also scrutinized.

4.5 Sample

A total of 252 women participated in the current study. However, only 209 questionnaire responses were used for analysis. A total of 42(16.7%) questionnaires were excluded as they were either not filled out or had many missing responses. There were two ways in which the questionnaire could be filled. These were either by pencil and paper or completed online from

a link that was sent to participants. A particular case was omitted from analysis because there was only one case filling in the category (question 3, adoptive father category), and posed as an outlier. That category will have to await analysis when a larger data set is available.

From these 252 women, 174 filled it in by pencil and paper; however, only 169 questionnaires were used from this particular group. A total of 76 females attempted the survey using computerized self-administered questionnaires which were online. Out of the 76 participants who attempted to fill the questionnaire online, there were only 41 (54%) completed the set of questionnaires. The high number of incomplete questionnaires may have arisen from respondents who were either just curious but could not proceed to responses, or who left an undesirably large amount of questions empty. A low response rate of 54% was observed from the computerized self-administered questionnaires as compared to 97.23% obtained from the hand scored ones. The total response rate combined from the paper and pencil as well as the online link was 83.3%.

All respondents were Batswana nationals sampled mainly in Gaborone, the capital city of Botswana. However, there were other Batswana who responded to the online questionnaire from other places in Botswana as well as other countries. There were 4 participants whose responses online showed they were outside Botswana, yet Batswana. The respondents' ages ranged between 18 years to 55 years, with a mean age of 39 years. Within this sample, there were 37.9% married respondents, 53.4% were never married, 5.3% were cohabiting, and 3.4% were widowed and divorced.

Participation was fully voluntary and respondents were informed clearly of the study and what is expected from them through the informed consent (Appendix 1), which they had to sign before responding to the questions. There were no incentives offered for taking part in the study. These Respondents were selected using a blend of both the purposive and convenient sampling methods since the study was aimed at investigating a homogenous group of females. Purposive and convenient samplings were also considered as they are time efficient methods considering the limited amount of time given to complete this study.

Measures were taken to ensure good representation of economic and social classes and demographic diversity as an inclusion criterion. Therefore, participants were recruited in three different settings where such diversity could be sourced and achieved. There were those recruited online using computerized self-administered questionnaires. Through the use of

Facebook, 'closed groups' with women only were targeted and a short message containing the link to the survey was posted (See Appendix 2). From such a setting, it could be assumed that a mix of middle to high income class could be reached because Facebook usage is much more common among middle and higher income person. Settings where women could be grouped together to complete the survey by paper and pencil were also targeted. A postgraduate class (middle-upper class) and female cleaners (working class) from University of Botswana formed part of the participants. More participants were also obtained from the women who had brought children for post-natal classes to clinics in the greater Gaborone area. These were included to represent a mix of low to medium income sector of the society. Relevant authorities were involved and gatekeeper's permissions sought for surveying women in clinics as well as postgraduate classes and University of Botswana cleaners and postgraduate classes (See appendices 3 and 4).

4.6 Measures

The data reported here was collected using the survey method in the form of questionnaires. Surveys are used to identify the "extent and nature of any association or correlation" between variables of study (Haslam & McGarty, 2003 pp. 54). Questionnaires were also chosen for use in data collection as they are time efficient and have reasonable administration costs. Questionnaires are also easy to administer anywhere, making it possible to employ assistants without tampering with the validity of the data as compared to other forms of data collection like interviews (Haslam & McGarty, 2003). Data collected through use of questionnaires is thought to be more reliable, as participants respond anonymously. They are likely to respond honestly, with a minimized pressure to impress (Haslam & McGarty, 2003). The author constructed a self-report questionnaire (Appendix 1) aimed at assessing fathers' parental involvement as well as females' history of reproductive strategies. There were 36 questions of which 33 were close ended and 3 were open ended.

The questionnaire was translated into *Setswana* (Appendix 5), a local spoken language, to ensure that respondents who may have limited English language understanding were catered for. Back translation was used, whereby the questionnaire was translated into *Setswana* and then back into English to ensure that the meaning of items remains the same. To ensure that this instrument was valid, it was given to five postgraduate students, purposely selected for their level of understanding of research, to screen out for any ambiguous items, to correct

timing, as well as getting feedback on the clarity of questionnaire. To ensure construct validity, the questionnaire was given to the study supervisor and one other expert in the field of psychology within the Discipline of Psychology at UKZN for reading and comments.

4.6.1 Independent variables

There were two main independent variables in the current study. One looked at father presence or absences while the other addressed father's parental involvement in a daughter's life. Other related variables also tapped into were meant to clearly define father figures in order to include children who have never had a biological father figure, but rather other males considered as father figure such as the uncle and grandfathers in their lives. Stepfather-presence was also included.

4.6.1.1 *Father presence or absence*

There were four items aimed at carefully determining father's or male figure's presence in the female child's upbringing as well as an estimation of duration or length of exposure or presence experienced. Considering that the targeted Batswana population of the study had been previously reported by other researchers (e.g. Garey & Townsend, 1996) to have high percentages of up to 45 % of female single headed families, there were questions aimed at describing the kind of sample we have in terms of its true paternal involvement, and also to find out if the former statistics were still reflected in the current study or sample.

In order to categorize the respondents into "father present" and "father absent" during upbringing, the respondents were asked if they were raised in female single headed families and were asked to indicate an estimation of time in these three ways; a) almost all the time, b) some of the time, c) not at all. The estimated duration of father presence was asked as prior researches have noted its importance. Furthermore, families are not necessarily always in the same order in terms of member compositions over the years. There are different family setups, therefore, some questions aimed at clearly defining the kind of families or backgrounds from which the participants were reared. As a follow up to the former question, upbringing under both mother and father was probed and the same answer categories that estimate duration into a) almost all the time, b) some of the time, and c) not at all, were used. Some families have a male figure who is not necessarily the biological father but who plays the father parental role. This could be any of the male relatives such as the uncle, grandfather, or other males who are not the biological father such as a stepfather, or an adoptive father. Prior research has also shown differing effects that comes with the types of male presence in

the family, i.e. the stepfather. A question was posed to clearly define the kind of a male who played the significant role of a father in their lives. The estimation of the amount of time that the male father figure was present in their upbringing was left to the participants to categorize as either a) almost all the time, b) some of the time, and c) not at all.

4.6.1.2 *Father parental involvement*

There are many ways to measure fathers' parental involvement. For example, a father's parental role is often considered in terms of control, monitoring, material resources and support (De Graaf, Vanweesenbeek, Woertman, & Meeus, 2011). Similarly, in the current study, we looked at monitoring or control, material resources and support. Father parental involvement, which is the main independent variable of this study, was operationalized by monitoring or control, material resources, and support. A scale that measured father parental involvement was constructed (See Appendix 1, Question 5 to 14). It had 10 questions formulated by the researcher, guided by literature on father parental involvement. Thus, the ways in which father parental involvement is generally operationalized in other literatures was used as guide. It is worth noting that this scale on father parental involvement was measuring parental involvement of any of the males who played the role of a father in the respondents' upbringing.

4.6.1.3 *The Total Father Parental Involvement Scale*

This scale within the author-constructed questionnaire was made up of 10 questions (question 5 through 13 in Appendix 2 with the answer categories as follows; a) Always, b) Sometimes, c) Never, and d) Not applicable. These items were formulated. These answer categories which were initially coded as from 1 to 4 respectively were re-coded as follows; 0-Not at all, 3-Always, 2-Sometimes, and 1-Never. The higher the total sum of the scores would mean higher father parental involvement while the less the sum of the scores would mean less father parental involvement. When correlated with each other, these items were highly correlated with inter item correlations ranges between $\tau = 0.597$ and $\tau = 0.898$. To ensure that the scale was reliable, the scale's internal consistency was evaluated by checking for the alpha α level. An excellent coefficient alpha of $\alpha = 0.970$ was obtained.

4.6.1.3.1 Monitoring/control

A total of five questions were formulated to measure monitoring/control. These questions were part of the father parental involvement scale. They probed whether the father figure helped with schoolwork, whether he cared to know the daughter's whereabouts, whether he was interested in the daughter's general or social life matters, whether he could discipline the daughter for known wrongdoings, and whether he cared about whatever the daughter did. All these had a range of responses that could categorize the respondents into having had a father figure who could be "Mostly in control or monitoring the daughter" or "Moderately in control or monitoring the daughter", or "Not in control or monitoring the daughter" or inapplicable in cases where there was a sole female single-parent.

4.6.1.3.2 Material resources and support

Here, a total of four questions were also used to measure a father figure's involvement through support and material resources. They also formed part of the father parental involvement scale. These questions probed how often the father figure paid attention to their daughter's grievances, how often the daughter was rewarded for behaving well, how often the daughter was supported financially, how often the daughter was neglected financially (which was reverse coded at data entry). These items had a range of responses that could categorize the respondents into having had a father figure who could be classified as a "very supportive father" or "Moderately supportive father", or "Non-supportive father" or inapplicable in cases where there was a sole female single-parent.

There was a question that explicitly asked respondents to rate how often they felt their father's love into either all the times, some of the times or not at all.

There were other independent variables apart from those probing paternal parental involvement. These were potential confounding variables or variables pointed out before as having effects on the reproductive strategies. Such variables included marital status of parents, the age difference between their mothers and their first-born children and the number of siblings they had.

4.6.2 The dependent variables

The questionnaire had a section that explored female reproductive strategies, which was the main dependent variable. The female's reproductive strategies were formed from retrospective data drawn from participants' reproductive history. Reproductive strategies were assessed from several questions that the author formulated to operationalize the physiological and psychological traits with reference to sexual maturation, mating patterns, and parental investment.

The ages in years at which each participant experienced their first menstrual periods, the age at first sex, the desired number of sexual partners at a time, whether one has had more than one sexual partner at a time or not were asked. Names and identifying information was not collected either on the paper questionnaire or through the online questionnaire. Reproductive strategies related to reproducing and offspring investments were also probed. These included how many children each one has, age at first pregnancy and first childbirth, children spacing in years, and length in breastfeeding each child as well as whether the respondent's children had the same father or not.

4.6.3 Demographics

A few demographic questions were included toward the end of the measure which asked for age, marital status, place of upbringing, and level of education.

4.7 Analysis

The current study was aimed at finding if any of the female participants' retrospective data on reproductive strategies displayed any patterns and testing whether these patterns are the results of sampling error or could be predicted by paternal parental involvement, absence, or presence. Father parental involvement which was initially planned to be assessed in four sub-categories being; support, monitoring, resources, and control was later on combined into two; control/monitoring and support/material resources. These formed the independent variables. The dependent variable had three main categories which were; (1) onset of reproduction, which was operationalised by age at menarche, age at first sexual contact, age at first pregnancy and first child, (2) mating choices which were operationalised by actual and desired numbers of sexual partner, and (3) parental effort which was operationalised by number of children, child spacing, and length of breastfeeding.

A description of the sample under study was done by running descriptive statistics for demographic data. Then, both the independent and dependent variable characteristics were assessed and their descriptive statistics recorded too. Furthermore, hypotheses were tested using inferential statistics.

The analysis of different categories of father accessibility, that is whether present or not, as well as the Father Parental Involvement Scale with the reproduction strategies was done in stages with different statistical tests explained in results section. All statistical tests' assumptions were considered.

Using the Life-History model, it was hypothesized that female's reproduction strategies would be predicted by father parental involvement as well as father accessibility (presence/absence). Simple regression was used where the independent variable was continuous and was used to predict one other dependent variable. Where two or more continuous IVs were used to predict a continuous DV, multiple regression was used for prediction. Where the dependent variable was categorical or had presence or absence of a feature, logistic regression was carried out accordingly to test each of the hypotheses. Generally, logistic regression was applied when the dependent variable is categorical (Howell, 2002, Peng et al., 2002).

4.8 Procedures and ethics

4.8.1 Ethical review and gatekeepers' permissions

After the proposal had been reviewed and passed by the Ethics Committee of the University of KwaZulu-Natal (Appendix 6), it was reviewed and passed by the Ethics Review Board under the Ministry of Health in Botswana (Appendix 7). Gatekeepers' permission for data collection in different settings where data was collected was sought before administration. The University of Botswana gave permission for data collection from their employees and the postgraduate students. The Gaborone District Health Management Team gave permission to collect data from their premises (child welfare clinics) from volunteering participants who would be bringing their children from monthly child welfare check-ups (see appendices 3 and 4).

4.8.2 Pencil and paper administration

This study was conducted in three different settings. In one instance, a group of university of Botswana cleaners were organized into a room where they were handed the questionnaires and shown a box for dropping the completed questionnaire in. In the same manner, the masters' students also sought from University of Botswana were asked to fill the questionnaires in their respective classroom settings, before their lectures. At the community child welfare clinic, respondents were asked to fill in the questionnaire as they came and were informed to drop them into a box provided upon completion.

Respondents acted out of self-will and none was coerced by remuneration. They showed their willingness by signing the informed consent form attached at the beginning of the questionnaire. The informed consent form (Appendix 1) briefly introduced the respondents to the study and assured confidentiality and anonymity. Names and identifying information was not collected. The informed consent form gave information about what the study was about, therefore, the participants were told that they could withdraw their participation in the study at any time.

During the administration four respondents withdrew from participating in the study pointing out that they felt the questions were too personal. In the event where a participant could experience any negative psychological effects due to taking part in the study, counselling arrangements had been made with Emang Basadi Women's Association in Gaborone (see Appendix 8 for the letter of agreement) to take on any of such participant for counselling. However, none reported any problems that could be associated with participating in this study.

The researcher had decided on the types of settings for administration for the following reasons. It is common that pencil and paper self-reports, especially on sensitive nature can attract social desirability. The measure used could be classified as evoking reasonably low discomforts towards the participants. The nature of some of the information sought had a potential of yielding some undesirable retrospective data. It was anticipated that self-reporting in 'hand and paper' participation was possibly going to illicit social desirability whereby participants would either deny the undesirable behaviors one has engaged in or admit to the socially appealing ones. Hence, social desirability was curbed in two ways. In one way, as already described before, the questionnaires were administered to women in

groups' settings where they were handed in one sitting; all women filled them in and dropped them into a box. This set-up assured confidentiality and was anticipated to make respondents at ease as chances of matching respondent with the response sheet would be reduced. As this was explained at the beginning, this was thought as a means to curb impression management. The other means to reduce social desirability was through computer aided data collection technique. The Fluid Survey programme was used in sending out links (See Appendix 2) to Facebook groups with females. Fluid survey is an online survey tool that was paid for a period of a month to host the study. The argument posed was that if a respondent marks answers directly into a printed questionnaire and is aware that there is a possibility of the researcher matching her with the answers, she will more likely answer in a socially desirable manner, however, if the questionnaire is filled and submitted in a computer, tracing and matching responses with participants would be harder. In doing so, participants will be further assured on confidentiality. Participants who received the link could click onto it and read the informed consent and check in the box as a way of signing in an agreement to participate. If there was a failure to check in, the programme was set to not allow any proceedings into the questionnaires. At the end of the one month period, the data was transformed into MS excel, and later on transferred to SPSS and merged together with the pencil and paper scored ones for analysis.

5 Results

5.1 Overview

This chapter will present results in the following order: first, results under descriptive statistics are presented to give a general view of the kind of sample used. These include demographics that were reported and descriptions of both the independent and dependent variables. Thereafter the inferential statistical results are presented, whereby previously formulated hypotheses are tested using appropriate statistical tests taking into consideration each of their assumptions.

5.2 Descriptive statistics

5.2.1 Sample characteristics

5.2.1.1 Age

A total of 209 questionnaires filled by females who participated in this study were used for analysis. As displayed in *Figure 2*, their ages ranged from 18 to 55 with a mean age of 31 and a mode age of 28 (SD=6.76). However, 14(6.67%) participants did not list their ages. The age frequency polygon showed a rather positively skewed age distribution, possibly owing to the cut off age of 18 years.

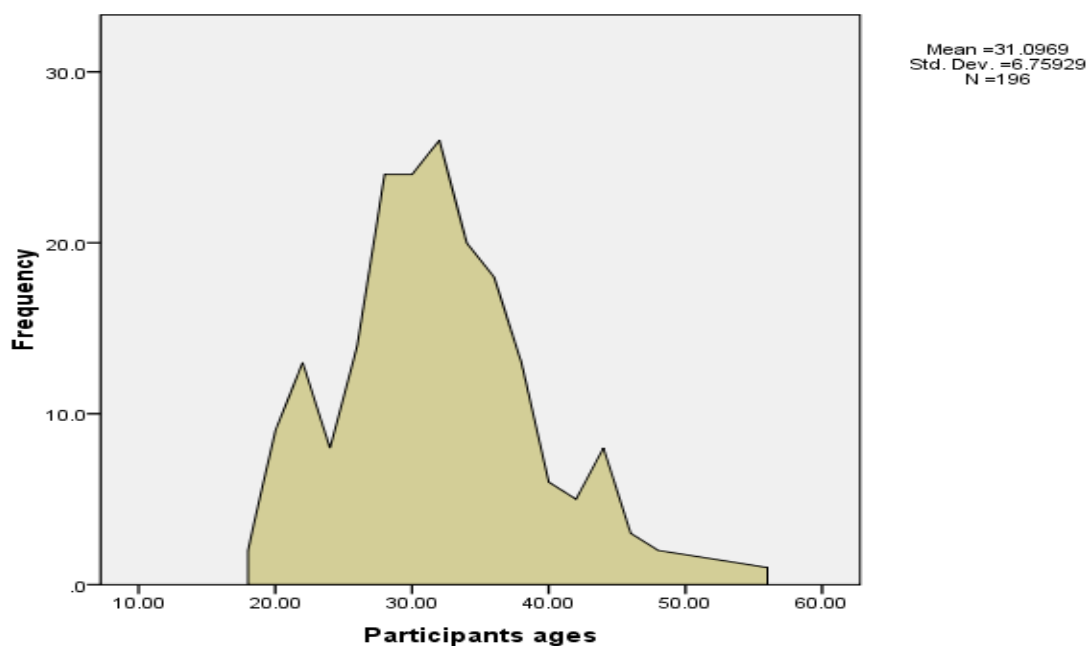


Figure 2: Age distribution of participants

5.2.1.2 *Place of upbringing*

As depicted in *Figure 3*, a majority of 53.1% respondents grew up in villages followed by cities (25.6%) and towns (16.4%) respectively. Small sectors of 4.8% were raised in farms, also commonly known as lands and cattle posts.

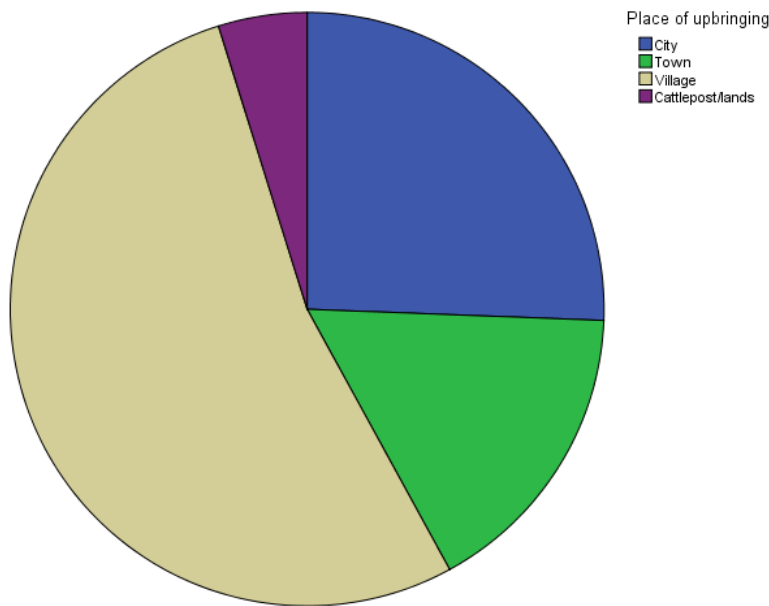


Figure 3: Place of upbringing

5.2.1.3 *Marital status*

As shown in *Figure 4*, a majority of 53.3% participants had never been married. There were 37.1% married participants, 5.2% participants were cohabiting, and 1% was divorced and another percent was separated, widows were less than a percent. Considering the sampling technique used, these marital status proportions may not depict the marital status quo in Botswana. According to the “Botswana Core Welfare Indicators Survey” (2009/10), 26.9% were married, 20.4% were cohabitating, and 37.2% were never married.

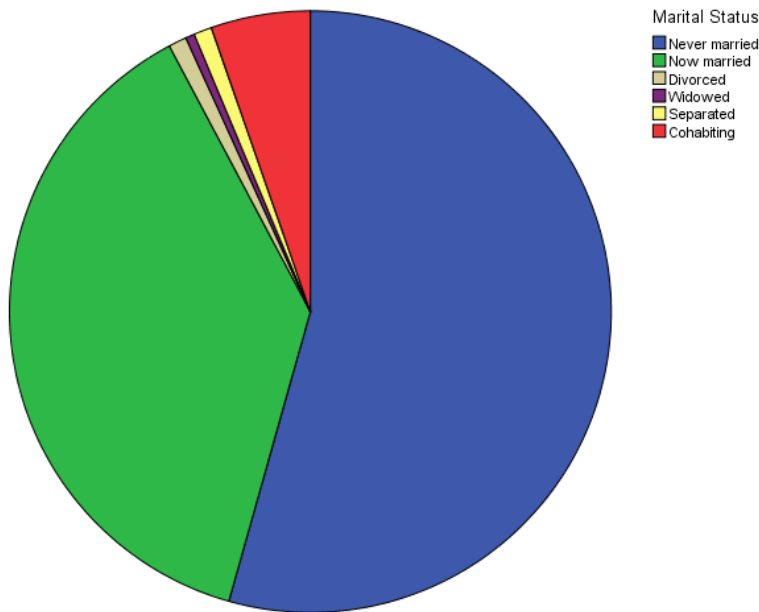


Figure 4: Marital status

5.2.1.4 Level of education

Figure 5 shows that there were 40.5% participants who indicated their level of education as secondary school, a small percentage of 5.3% either never went to school or had been through primary education. A total of 24.8% held bachelor's degree while 10.5 % had masters or beyond masters' level of education. The proportion of level of education here may as well not relate to the population proportions as the sampling method used was non-random and purposive. For instance, a class of postgraduate masters students was targeted for participation so that there could be diversity in terms of educational and economical level.

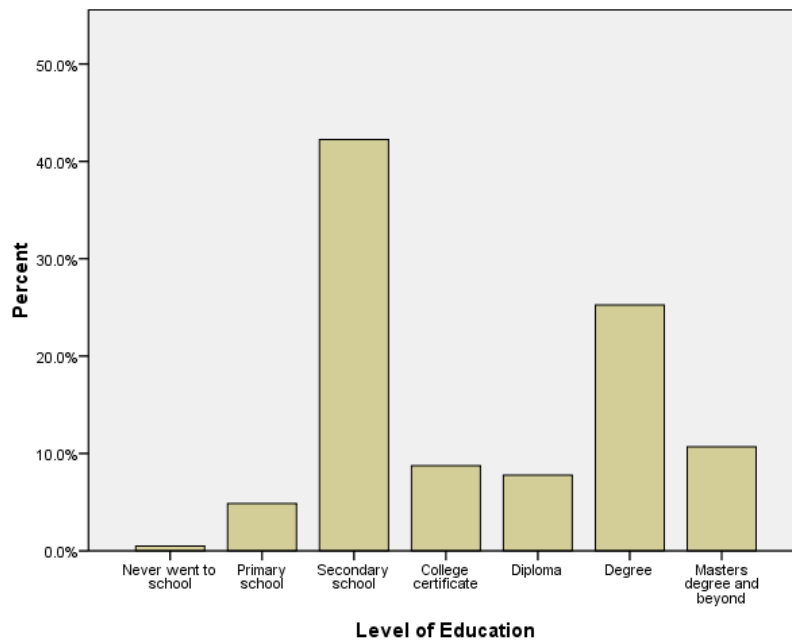


Figure 5: Level of Education

5.2.2 Fathers' parental involvement and upbringing characteristics

As an indirect question, participants were asked whether they were raised in female single parent only households. This was supposed to be estimated into duration time frames of almost all the time, some of the time, or not at all. As shown in *Table 1*, a majority of 54.3% participants were not at all raised in female single headed households. Just below 15 % were raised in female single headed families some of the times while 31% reported to have been raised in female single handed households almost all the time. Participants were also asked to indicate if they were raised by both their mothers and fathers, and in responding, they had to indicate by estimating the duration. There were 54.4% participants who indicated that they were raised by both mother and father almost all the time, this figure is close to the 54.3% of the total participants who had responded that they were never raised in a single headed family. There were 17.5% participants who indicated that they were raised by both mother and father some of the times, this figure was also close to the just below 15% of those who had indicated that they were raised in female single headed household some of the times. There were also 28.2% respondent who indicated not having been raised by both mother and father, similarly, a figure quite close to the 31% who had indicated having had been in female single headed household. A majority of 56.2% indicated that a biological father was the male figure who played the father role in their lives, 12.9% indicated stepfathers as father role, 15.8% indicated that they had other male relative who played the father role while 13.9%

indicated that they had never had any one playing a father role in their lives. When asked to estimate the indicated father figure's presence in their upbringing, the indicated father figure was present in 56.7% participants' upbringing almost all the time. There were 24.8 % participants who indicated living with a father figure some of the time and 16.5 % indicated that they never had a father figure in their upbringing.

There are some similarities as well as slight differences worth noting, in all the questions probing the father presences or absence and estimated duration of presence. The responses show some level of agreement. Just around 55% of the participants were raised by their biological father within the household most of the time. When grouping those who were raised by female single parents almost all the time and some of the time, the sample constituted around 45% of this category. This is also reflected the four other questions probing father presence and absence. The 45% of the participants is shared by sole female single parents and other non-biological fathers. For instance, when asked whether they were raised by both mother and father, a total of 54.5% indicated that they were raised by both parents almost all the time.

Table 1

Sample Characteristics

Characteristic	Frequencies	Percentages (%)
Raised in female single headed household		
Almost all the time	65	31
Some of the time	31	14.8
Not at all	114	54.3
Raised by both parents		
Almost all the time	112	54.4
Some of the time	36	17.5
Not at all	58	28.2
The person who played the role of a father.		
Biological father	118	56.9
Stepfather	27	12.9
Other male figure	135	15.8
No male figure	28	13.9
Estimated length of stay with the father figure indicated		
Almost all the time	119	56.7
Some of the time	51	24.8
Not at all	34	16.5

5.2.2.1 Family composition background

Previous research (e.g. Amato, 2000) has shown that daughters copy their mothers' reproductive tendencies, hence a question probing the mother's age at her first child bearing was asked. *Figure 6* below shows that a modal age differences between a participant's

mother and her first child was 20 years, with a range of 11 years to 48 years. The mean age difference between participants' mothers and themselves was 21 (SD=4.97).

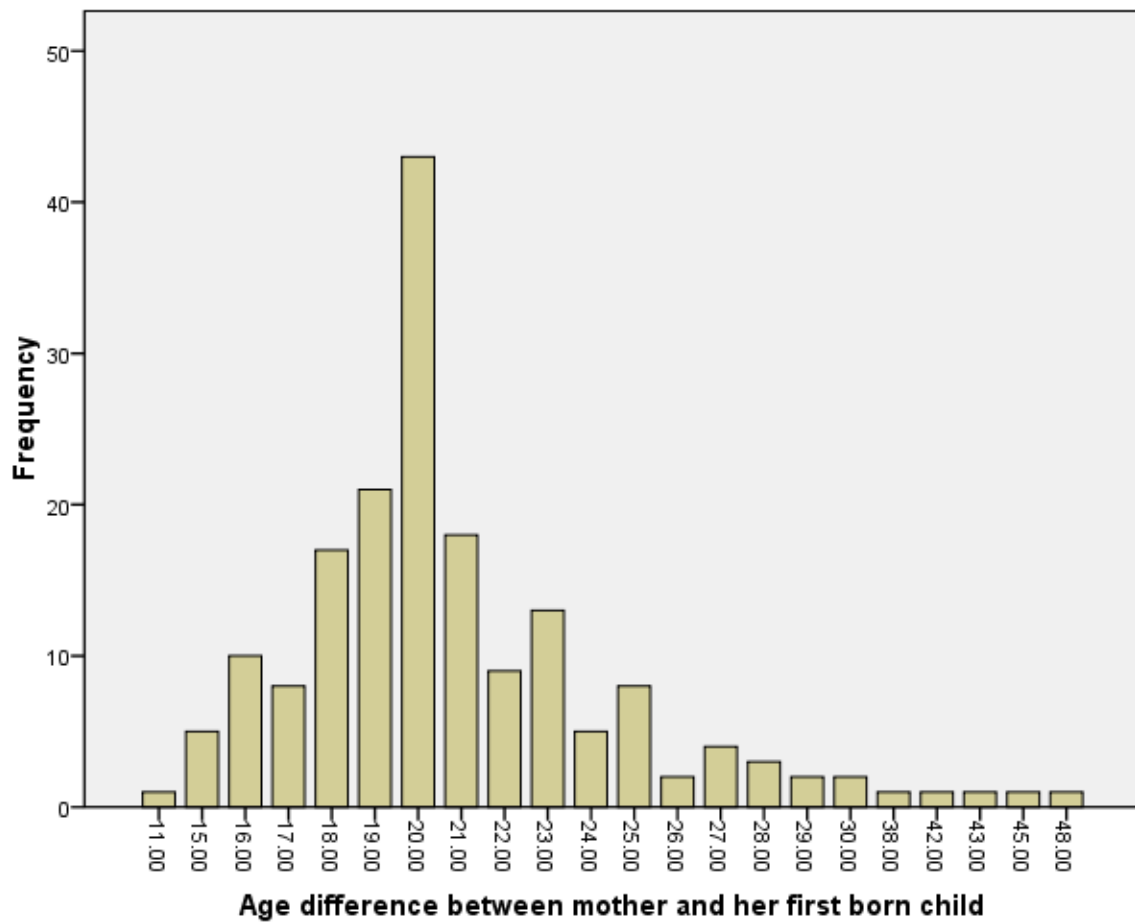


Figure 6: Bar chart showing the age differences between participant's mother and their first born child.

5.2.3 Participants' reported number siblings

The number of participants' siblings ranged from none to 17 siblings. And most participants had two siblings.

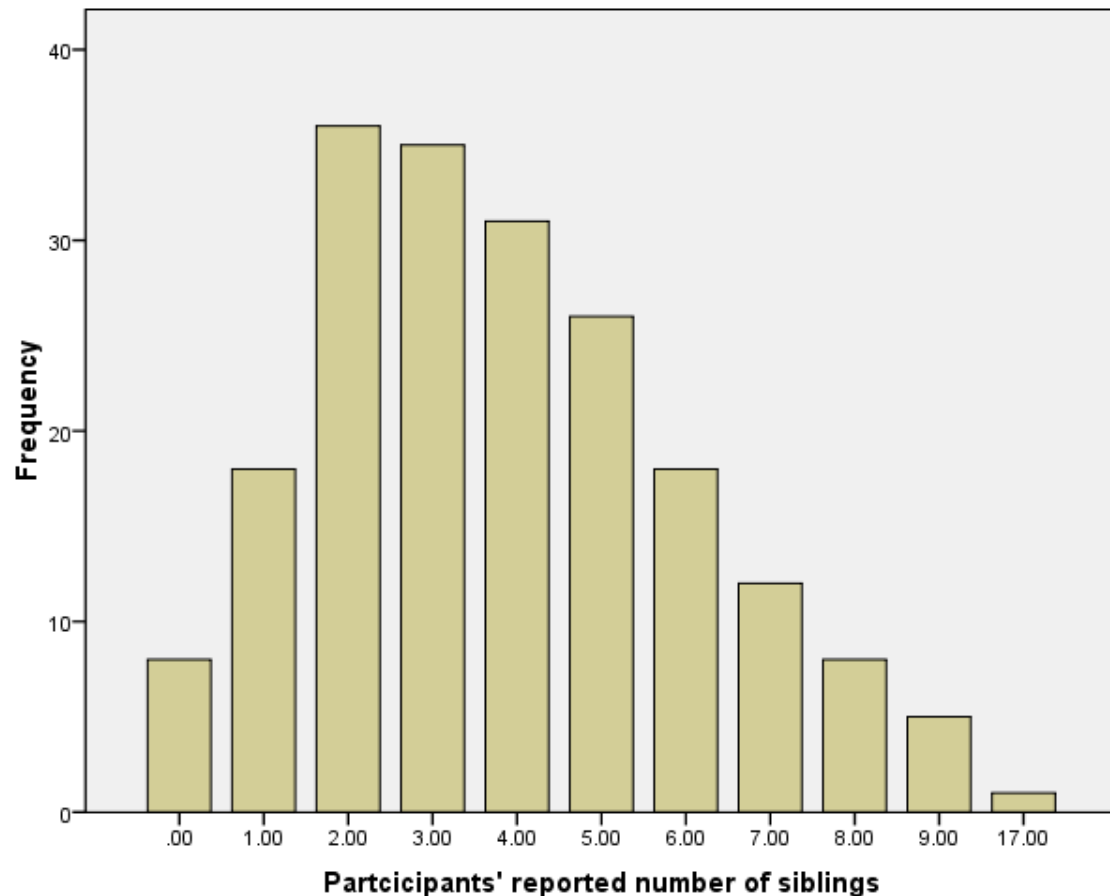


Figure 7: Bar chart showing participants' number of siblings.

5.3 Dependent variables

This section was aimed at answering the first main research objective that aimed at reporting reproductive strategy trend in Botswana. This was addressed by several variables which acted as the dependent variables. These variables which were sexual reproductive strategies, included age at menarche, age at first sex, actual and desired number of sexual partners, age at first pregnancy and at first birth, number of children, child spacing, length of breastfeeding, and whether the participants' children had the same father or not.

5.3.1 Age at menarche

Shown in *Table 2*, the reported age at which the participants reached menarche ranged from 12 to 23 years. There were 10 participants ($n=209$) who did not list their ages. The sample mean age at first menarche was 15.1, the median age was 15 and the modal age was 16. There were a few extremes of up to 23 years.

Table 2

Age at Menarche

Age in years	Frequencies	Percentages (%)
12	9	4.9
13	39	19.5
14	29	14.5
15	40	20.0
16	41	20.5
17	19	9.5
18	16	8.0
19	4	2.0
20	1	0.5
22	1	0.5
23	1	0.5

5.3.2 Age at first sex, sexual engagement, and partnering

Table 3 shows that a majority of 86.1% of participants had indicated that they had once engaged in sexual activities. Only a percent did not respond to this question. There were 31.7% of the participants who indicated to have had more than 1 sexual partner at a time. A majority of 68.3% of the participants reported that they had never had more than one sexual partner at a time.

As shown in *Figure 8*, participants' reported ages at first sex forms a normal distribution with a mean, mode and median of 19 years. A total of 17 participants did not report their ages at first sex. This could be those who many not have wanted to respond to the question as well as those who may have never engaged in sex. The reported ages at first sex ranges from 7 years to 31 years.

Also in *Table 3*, there were 12.3% of participants who had no children, 36% had one child, 33.5% had two children, 12.6% had three children, while the highest number of children per participant was four from 5.6% of participants. The modal number of children was one child per participant and the median was two children per participant. There were 64.5% of participants who reported that all their children had one father, while 34.6% of participants reported that their children had different fathers. Considering that 42.3 % of the participants had at most one child, the reported 34.6 % participants who had children with different fathers was a part of the 57.7%. Therefore, a majority 34.6% out of 57.7% of women with more than one child had different fathers to their children.

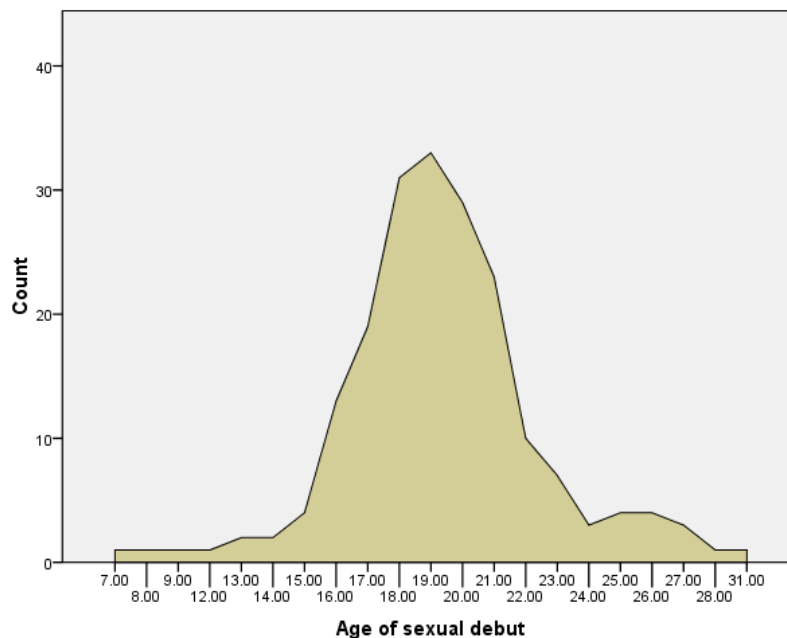


Figure 8: Frequency polygon showing participants' reported age at first sex

Table 3

Listing Sexual Engagement Characteristics, Partnering, and Number of Children

Characteristics	Frequencies	Percentages (%)
Had ever engaged in sexual activities before	179	86.1
Yes	19	13.9
No		
Had more than one sexual partner at a time		4.9
Yes	63	31.7
No	136	68.3
Number of children		
0	25	12.3
1	73	36.0
2	68	33.5
3	26	12.8
4	11	5.6
Do children have the same father		
Yes	89	65.4
No	47	34.6

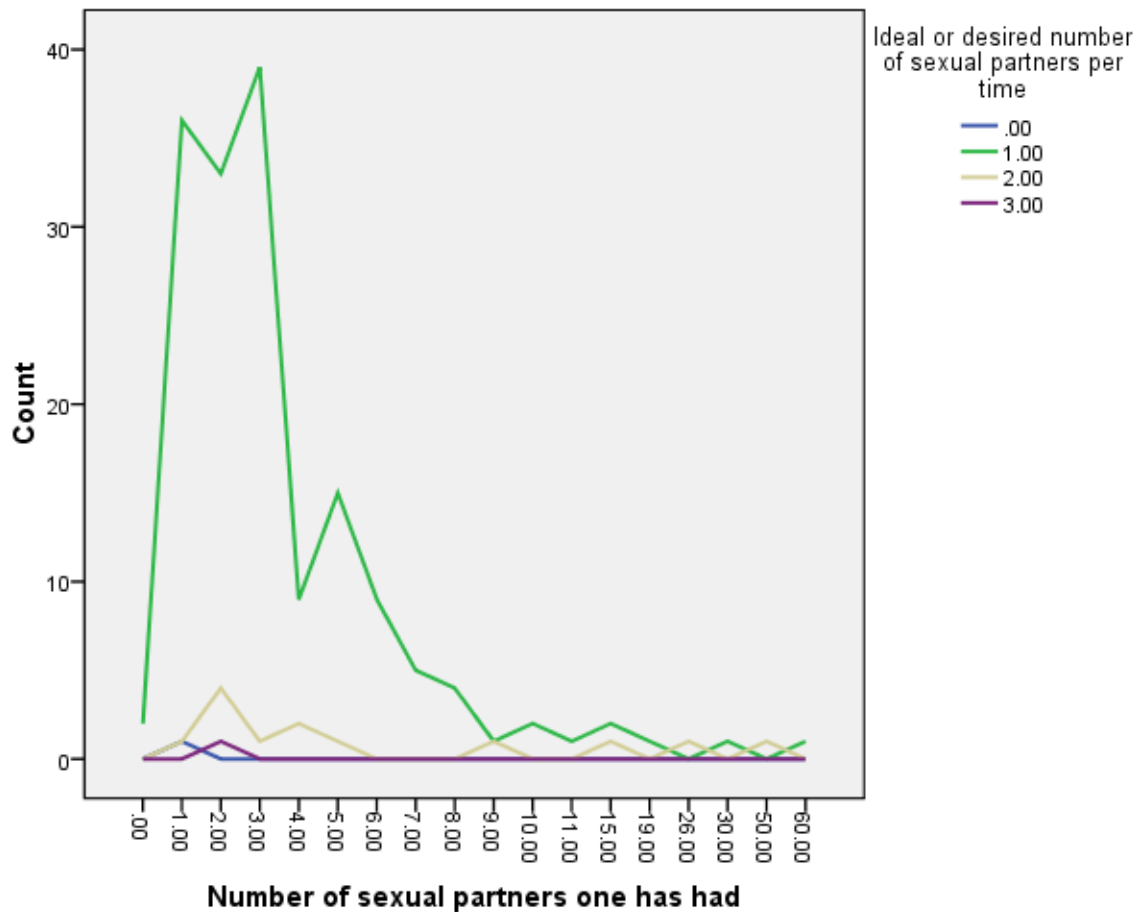


Figure 9: Reported ideal number of sexual partners and number of sexual partners one has had.

5.3.3 Sexual partnering

As seen in Figure 9, participants were asked to list the number of sexual partners they have ever had and these ranged from none to 60 sexual partners. Most participants (91.5%) recorded that the ideal number of sexual partner was one, a few (less than a percent) preferred no sexual partner at all, about 7% preferred two sexual partners per time, and a percent preferred three sexual partners per time. There were 25 respondents who did not respond to this question. The mean number of sexual partners one ever had ever had was 4.19; the median was three and a mode of one. It is worth noting that the extremes such as the participant who reported to have had 60 sexual partners before, noted their ideal number of sexual partners as one per time. Also those few who had indicated that they had two sexual partners per time indicated that their preferred sexual partners per time was three. Figure 4 shows that the actual number of sexual partners one has had was higher than one's ideal or desired number of sexual partner. Of the 209 participants, 21 of them did not respond to the

question on the ideal number of sexual partners at a time. The average number of sexual partners was 4. However, it is worth noting that there were extremes which may have affected the mean

5.3.4 Ages at first birth and first pregnancy

Age at first pregnancy Stem-and-Leaf Plot

Frequency	Stem & Leaf
2.00	15. 00
2.00	16. 00
5.00	17. 00000
12.00	18. 0000000000000
15.00	19. 000000000000000
29.00	20. 0000000000000000000000000000000
18.00	21. 000000000000000000
11.00	22. 000000000000
14.00	23. 000000000000000
11.00	24. 000000000000
11.00	25. 000000000000
9.00	26. 000000000
11.00	27. 000000000000
6.00	28. 000000
3.00	29. 000
4.00	30. 0000
4.00	31. 0000
4.00	32. 0000
2.00	Extremes (>=33.0)

Stem width: 1.00
Each leaf: 1 case(s)

Figure 10: Stem-and-leaf plot for ages at first pregnancy

The earliest first pregnancy age reported was 15 years. About 15.2% of the sample's reported age at first pregnancy falls into teenage pregnancies. The modal age at first pregnancy was 20 years. The mean age at first pregnancy was recorded at 22.7.

Age at first child Stem-and-Leaf Plot

Frequency	Stem & Leaf
1.00	15. 0
2.00	16. 00
2.00	17. 00
11.00	18. 000000000000
15.00	19. 000000000000000
24.00	20. 000000000000000000000000
21.00	21. 000000000000000000000000
13.00	22. 00000000000000
13.00	23. 00000000000000
13.00	24. 00000000000000
8.00	25. 00000000
10.00	26. 0000000000
12.00	27. 000000000000
7.00	28. 0000000
5.00	29. 00000
5.00	30. 00000
4.00	31. 0000
5.00	32. 00000
.00	33.
1.00	34. 0
1.00	Extremes (>=40.0)

Stem width: 1.00
Each leaf: 1 case(s)

Figure 11: Stem-and-leaf graph for ages at first child birth.

The earliest age at first child reported was 15 years. Corresponding with age at first pregnancy, the modal age at first child was also 20 years. The mean age at first child birth was recorded at 23.2 years.

5.3.5 Parental investment

5.3.5.1.1 Child spacing and length of breastfeeding

According to *Table 4* below, there were only about half (106) of the sample that recorded the age differences in years of their first and second child, the mean age difference here was 5.32 years and modal age difference obtained was 2 years. Age difference between first and second child ranged up to 19 years. Child spacing between second and third child was only recorded by 41 participants. The average age difference was 5.39 with a modal age difference of 2. Worth noting, the spacing difference average age decreases by about a year for subsequent children after 1st child and second child age difference.

There were 169 participants who responded to the question on breastfeeding. The average length of breastfeeding in months was recorded as 10.6 months and the most frequently appearing length of breastfeeding was 12 months. The average length of breastfeeding increases with subsequent child by about a month each. The longest period of breastfeeding was 38 months.

Table 4

Summary of Child Spacing and Breastfeeding Duration Recorded.

	N	Mean	Mode	SD	Range
	Valid				
1st and 2nd child spacing	106	5.32	2	4.09	19
2nd and 3rd child spacing	41	5.39	2.00a	3.64	17
3rd and 4th child spacing	17	4.35	2.00a	3.66	12
4th and 5th child spacing	6	4.83	3	6.55	18
First child length of breastfeeding in months	169	10.63	12	7.15	36
Second child length of breastfeeding in months	97	11.66	12	7.41	29
Third child length of breastfeeding in months	36	12.14	.00a	9.80	38
Fourth child length of breastfeeding in months	13	11.85	.00a	9.92	28
fifth child length of breastfeeding in months	2	4.50	.00a	6.36	9

5.4 The Total Father Parental Involvement Scale

A portrayed on *Table 5*, a self-constructed scale measuring total father parental involvement was created and the inter-correlations of the items ranged from $\tau = 0.597$ and $\tau = 0.898$. Internal consistency checked by Cronbach's alpha yielded an excellent coefficient alpha of $\alpha = 0.970$.

Table 5

Correlation matrix for the Total Father Parental Involvement Scale

	1	2	3	4	5	6	7	8	9	10
My father helped me with my schoolwork.	-									
My father would pay attention to my grievances.	.783**	-								
I felt my father's love.	.741**	.872**	-							
My father cared to know my whereabouts.	.760**	.817**	.898**	-						
My father had interest in my general or social life	.754**	.840**	.870**	.862**	-					
Whenever I was wrong in my father's disciplined	.636**	.715**	.814**	.818**	.813**	-				
My father cared about whatever i did.	.719**	.827**	.888**	.887**	.859**	.808**	-			
My father rewarded me whenever i behaved well.	.722**	.791**	.859**	.822**	.796**	.783**	.830**	-		
									-	
My father supported me financially.	.726**	.818**	.867**	.871**	.835**	.809**	.886**	.815**		
My father financially neglected me.	.597**	.669**	.746**	.752**	.744**	.706**	.747**	.638**	.809**	-1

** . Correlation is significant at the 0.01 level (2-tailed).

5.5 Hypotheses testing (inferential statistics)

5.5.1 Effects of father absence on daughter's reproductive strategies

This section was aimed at responding to some of the main research objectives by answering the questions listed below. Some statistical tests were employed to test the hypotheses posed.

Research Questions posed:

1. Does a father's absence have effect on a daughter's reproductive strategy?
2. How do the different forms of father parental involvement (monitoring and control, support and material resources) relate with the different forms of female reproductive strategies categories (mating choice, onset of reproduction and parental effort)?

The current study had propositions guided by the Life History Theory which were tested using different statistical tests. As noted below, each of the propositions was tested taking account of statistical assumptions for each of the tests used. SPSS version 17 was used to perform the statistical tests.

Proposition 1-The overall rate and phases of sexual maturation in females will be critically linked to father's parental involvement.

Using the Life History Theory, a faster life history for females who have experienced less or no paternal involvement was anticipated and slower life history for those who have had paternal involvement was expected. Thus, the following sexual strategies categories were predicted with either father parental involvement or presence/absence.

5.5.1.1 Age at menarche

Proposition 2 –Age at menarche is related to father parental involvement. The lesser the father parental involvement, the more likely the girl child will reach menarche earlier. Also, where a father is absent, early menarche is more likely.

To test this proposition, differing statistical approaches were used. Firstly, simple linear regression was used to predict age at menarche using Father Parental involvement scale. Here, age at menarche was taken as a continuous variable as well the Father Parental Involvement Scale scores. The proposition suggested that females who received less total

father parental involvement, as indicated by the Total Father Parental Involvement Scale scores, would reach age at menarche earlier than those who received higher father parental involvement as indicated on Father Parental Involvement Scale. Results showed a low R^2 and insignificant regression only about a percent (adjusted $R^2 = .013$, $F = 3.422$, $p = .066$) of the variance in age at menarche can be explained by the Total Father Parental Involvement Scale. This regression model therefore did not significantly predict age at menarche which is the outcome variable.

Secondly, analysis was conducted to test if age at menarche is related to father parental involvement by predicting age at menarche using grouped age categories. Here the dichotomized age at menarche was predicted by a number of predictor variables as listed in *Table 6*. The predictors were derived from the questions 1 to 4 (Appendix 1) on father role players, father presence and availability, and they had multiple responses. From these dummy coding was performed on the multiple responses in such a way that father absence was marked '1' while presence was '0'.

These predictors as shown in *Table 6* included: 'father role-stepfather', 'father role-other related male', 'father role-father absent', (where biological father presence acted as reference category. Then followed responses for 'upbringing female headed all times', 'upbringing female headed sometimes', (where 'upbringing female headed not at all' acted as a reference category). 'Upbringing both parents sometimes', 'upbringing both parents not at all', (where 'upbringing both parents all the time' acted as reference category). 'Father figure present at home sometimes', 'father figure present at home never', (where 'father figure present at home all the time' acted as a reference category). 'Parents not married' where 'parents married' was the reference category. All the reference categories, which were referring to biological father accessibility/involvement were dummy coded '0' where the opposite categories were dummy coded in such a way that a '1' meant presence of the desired variable, in this study, this was for father absence or low to no involvement.

Age at menarche was grouped into two categories. These categories were meant to separate participants into early age at menarche and late age at menarche. Whereby the presence of the variable of interest (early menarche) was dummy coded as '1' and the absence as '0'. The ranges from earliest age at menarche reported to age 13 was categorized as early menarche and dummy coded '1' while all ages from 14 and above were categorized late menarche onset

and dummy coded '0' (age at menarche ranged from 12 to 23). The age cutoff point into early or late menarche was set to be 13 as it is the common average age at menarche reported in literature (Culpin et al., 2015). Thus a dichotomous dependent variable was created and hence logistic regression was used to make predictions meeting one of the assumptions of logistic regression. There were several predictors which were either continuous or dichotomous. These variables, according to the Life History Theory, would predict a faster or accelerated reproductive strategy as they include, absence of a father, or compromised father accessibility, as well as low father parental involvement. In all variables, father presence option acted as the reference category. Results revealed that the influence of a combination of Father Parental Involvement Scale, upbringing by a stepfather, upbringing by other male relative (such as grandfather, uncle etc.), father absence, growing in female single headed family, growing in a family sometimes led by female, having had no father figure at all, having had a father figure some of the times produced significant prediction of whether a female reaches menarche early or not ($p < 0.05$). The amount of variance explained by the model ranged between 10.9 and 17.3 per cent. As shown in Table 6, the most important predictor for age at menarche in this model was having been brought up by a stepfather, significant at ($p = .004$), followed by having both parents available sometimes and having been in a female single headed family sometimes respectively. The odds ratio for the variables is considered to offer better explanation of the coefficients. "A significant odds ratio with a value below 1 indicates that the independent variable reduces the odds of the dependent variable having a value of 1, and an odds ratio greater than 1 indicates an increase in these odds. Subtracting 1 from the ratio and multiplying by 100 gives the percentage change in the odds of the dependent variable having a value of 1" (Crosnoe, Mistry, & Elder, 2002). Therefore in the model entered, the variable 'females with stepfathers as father role players' has a significant odds ratio of .570 which suggests that stepfather presence reduces the odds for age at menarche. Switching from Biological father to stepfather increased the odds of early menarche by 43%.

The second most important significant predictor of age at menarche was 'not having been raised by both parents at all' ($B = -1.276$, $p < 0.5$). Having not been raised up by both parents at all reduces the odds of age of menarche.

Table 6:

Results from Logistic Regression Predicting Early or Late Menarche

	Unstandardized Coefficients (SE)
Father role-Stepfather (1)	-1.843 ** (.570)
Father role-other related male(1)	-.577 (.071)
Father role-Father absent(1)	.554 (.960)
Upbringing Female headed All times(1)	.936 (.755)
Upbringing Female headed Sometimes(1)	1.478 (.818)
Upbringing Both parents sometimes (1)	-1.863 (.754)
Upbringing Both parents Not at all(1)	-1.276 * (.948)
Father figure present at home sometimes(1)	.691 (.537)
Father figure present at home never(1)	-.007 (.695)
Parents not married (1)	-.377 (.535)
Constant	.456 (1.183)

** Significant at $P < .01$ *significant at $p < .05$

5.5.1.2 *First sex timing or sexual debut*

Proposition 3 – Sexual debut is related to total father parental involvement. The lesser the father parental involvement, the more likely the female child will start sex earlier than their counterparts. Also, females with absent fathers are likely to engage in earlier onset of sexual activities than those brought up with fathers present.

A prediction was made that females who had their fathers absent or less present during upbringing as well as those who scored low in the Total Father Parental Involvement scale would engage in earlier onset of sexual activities, also extending from the expected fast life history. The absence of a father or less paternal involvement in upbringing cues for an

unpredictable environment in a girl child with regards to a male's availability in helping to rear children. This may influence a girl child to develop reproductive cues that are consistent with accelerating reproduction. This results from discounting in future fitness by expending energies to current reproduction as it is supposed as a better allocation of resources.

The dependent variable here was also dichotomized into early onset of sexual activities and not early onset of sexual activity. In Botswana, any child below the age of 16 is considered a minor and therefore not mature enough to be considered informed to consent for sexual intercourse (in Fox, Ferguson, Ajose, Singh, Marum, & Baggaley, 2013). This legal age for consent for sex was used as our cut off point where onset of sexual activities recorded as below 16 was categorized as early onset of sexual activities and above 16 as not early onset of sexual activity. Logistic regression was used to test this proposition and the following predictors were entered in this model to predict onset of sexual activities: upbringing by a stepfather, upbringing by a other male relative (such as grandfather, uncle etc.), father absence, growing in female single headed family, growing in a family sometimes led by female, having had no father figure at all, having had a father figure some of the times, and having had unmarried parents. These were dummy coded in the same manner as variables entered in the model for age at menarche. Where '1' meant true for the variable and '0' meant absence of the named variable, for example, where a response was marked as 'brought up by a stepfather' the dummy code would be '1' for the variable 'upbringing by a stepfather' and if the variable not selected, a dummy code of '0' was given. This model was not significant. The Omnibus Test of Model Coefficients were not significant ($p = .353$), therefore, the influence of the predictors listed above did not predict a significantly improved prediction of whether or not the respondent falls into the category of early onset of sexual activity. Only about 10% of the variance can be explained by this model. Therefore, the hypothesis which suggests that females who did not experience father parental involvement are likely to engage in earlier onset of sexual activities than their counterparts was not proved.

5.5.2 Offspring reproduction and parental investment

Proposition 4— Age at first pregnancy and first child bearing is related to total father parental involvement. The lesser the father parental involvement, the more likely the female offspring will have earlier first pregnancies and the younger they will be at the birth of their first child than their counterparts.

Similarly, presented with a trade-off between reproduction versus self-maintenance, females who did not experience paternal involvement were expected to have reproduced earlier than their counterparts as they trade off their bodily maintenance for reproduction, a fitness cue imprinted by their past experience about potential suitor's predictability. With age as a continuous variable, multiple regression was used to test if a number of predictors would significantly predict age at first pregnancy. The following predictors were entered; upbringing by a stepfather, upbringing by other male relative, father absence, growing in female single headed family, growing in a family sometimes led by female, having had no father figure at all, having had a father figure some of the times, and having had unmarried parents. The results were not significant and hence the hypothesis stating that females who did not experience father parental involvement are likely to experience earlier pregnancies than their counterparts was not proved.

Proposition 5 – Sexual partnering is related to total father parental involvement. The lesser the father parental involvement, the more likely the female offspring will engage with multiple sex partners as compared to their father-involved counterparts. Also, females with absent fathers are more likely to engage in sexual relations with multiple sexual partners than those brought up with their fathers present.

According to the Life History Theory, females with absent or uninvolved fathers will view male availability as unpredictable; therefore, at pair bonding stage, they are likely to engage in multiple partnering. To test this hypothesis, multiple regressions were used to predict sexual partnering. The results showed that the predictors (total father parental involvement, upbringing by a stepfather, upbringing by a other male relative, father absence, growing in female single headed family, growing in a family sometimes led by female, having had no father figure at all, having had a father figure some of the times, and having had unmarried parents) could only explain less than a percent of the variance and the results were not significant ($R^2 = .005$, $F = 1.078$, $p > .01$). Therefore, whether a female child grew up without a father or whether their fathers were involved or not did not affect their outcomes in terms of sexual partnering patterns. However, looking at the coefficients for individual predictors, the Total Father Parental Involvement Scale emerged as the most important and significant predictor of sexual partnering ($b = -.329$, $p = .01$).

Table 7:

Results from Multiple Regressions Predicting Sexual Partnering.

	Unstandardized Coefficients (SE)
NS Total	-.329** (.138)
Father role-Stepfather (1)	1.372 (1.895)
Father role-other related male(1)	1.628 (2.209)
Father role-Father absent(1)	-2.600 (3.329)
Upbringing Female headed All times(1)	.301 (2.408)
Upbringing Female headed Sometimes(1)	-1.333 (2.394)
Upbringing Both parents sometimes (1)	-1.185 (.2.637)
Upbringing Both parents Not at all(1)	-1.373 (2.941)
Father figure present at home sometimes(1)	.130 (1.533)
Father figure present at home never(1)	-4.338 (2.450)
Parent not married 1)	-1.470 (1.517)
Constant	12.436 (3.457)

** Significant at .01

Proposition 6 –Female parental effort is related to total father parental involvement. The lesser the father parental involvement, the more likely female offspring will have many more offspring than their father-involved counterparts. Also, females with absent fathers are likely to have several offspring as compared to those brought up in father-present homes

This is explicated by a trade-off between mating and parental efforts. The uncertainties arising from low paternal investment mean that the daughter views the world as uncertain and dangerous, and thus needs to produce more offspring (in order to resist chance deaths). But producing more offspring must necessarily reduce the amount the mother can invest in any particular child.

Here parental effort was measured in terms of number of offspring, length in breastfeeding and child spacing. A typical example is observed in the choice between longer breastfeeding periods versus early weaning. Longer breastfeeding periods characterize maximum parental effort on one child at a time and shorter breastfeeding periods characterize diverting resources to mating and consequently more offspring and less parental care. Breastfeeding also makes it less likely that a woman will conceive another child, and prolonging breastfeeding was used as a contraceptive by some traditional African societies. However breastfeeding is also resisted by many women in modern times being seen as rather primitive and as limiting what a woman can do (L. Lachenicht, personal communication, June 17, 2015). Child spacing and length of breastfeeding was not significantly predicted by either total father parental involvement as well as father accessibility.

As projected on *Table 8*, multiple regression was used to test if father parental involvement as well as father accessibility could predict number of offspring. The following predictors were entered; total father parental involvement (NS Scale), upbringing by a stepfather, upbringing by other male relative, father absence, growing in female single headed family, growing in a family sometimes led by female, having had no father figure at all, having had a father figure some of the times, and having had unmarried parents. The result of the regression showed that the eight predictors explained between 5% and 11% of the variance. This model was significant at $p = .048$ Growing up with absolutely no father figure was the strongest predictor of number of offspring ($B = 1.00$, $p = .002$) followed by having a father figure present some of the times ($B = .531$, $p = .014$).

Table 8:

Results from Multiple Regressions Predicting Number of Offspring.

	Unstandardized
	Coefficients
	(SE)
NS Total	.006
	(.019)
Father role-Stepfather	-.027
	(.271)
Father role-other related male	-.501
	(.323)
Father role-Father absent	-.304
	(.483)
Upbringing Female headed All times	-.142
	(.342)
Upbringing Female headed Sometimes	.250
	(.337)
Upbringing Both parents sometimes	-.429
	(.365)
Upbringing Both parents Not at all(1)	-.185
	(.424)
Father figure present at home	.531**
sometimes	(.213)
Father figure present at home never	1.009***
	(.328)
Parent not married	-.163
	(.217)
Constant	

***significant at .005

**Significant at .01

5.5.2.1 *Effects of monitoring/control and material resources/support resources subscales*

As paternal parental involvement can take many forms, there were two other subscales of Father Parental Involvement Scale that measured a father's involvement by monitoring/control and material resources/support. When used to predict the different reproductive strategies, none of the dimensions was found to be a significant predictor.

6 Discussions

6.1 Overview

This chapter discusses the findings of the current study and how they relate to other similar studies conducted before. The Life History Theory as proposed is also tested as well. The implications of the results are discussed. A critique of the design is also offered. Recommendations for both policy makers as well as for future studies are also proposed.

The discussions were approached in the following format; first, the sample's general trends of family set-up in terms of father accessibility as well as paternal parental involvement are discussed. Then follows the general trends of reproductive strategies. Thirdly, the propositions presented before are also discussed and a conclusion is drawn.

The main aim of the current study was to investigate the role of father parental involvement on female reproductive strategies. The study hypotheses were derived from a body of literature that supported a link between father parental involvement and accessibility in cuing for different reproductive strategies. The hypotheses were also generated from the Life History Theory which speaks for father parental investment as one of the main cues for reproductive strategies choice. Using the Life History Theory, father availability and high paternal parental involvement was expected to significantly cue for later menarche, later sex debut, later first pregnancies, later first child, stable sexual pair-bonding, fewer offspring as well as and high parental investment in females.

Overall, Life History Theory was not supported. Father parental involvement did not significantly predict reproductive strategies in total, rather, a few individual reproductive strategies. Early or late onset of menarche is predicted by father parental involvement as well as accessibility. Sex debut, age at first pregnancy, age at first child, and parental investment is not significantly predicted by father parental involvement as well as accessibility. Sexual partnering is significantly predicted by total father parental involvement. Number of offspring was also significantly predicted by total father parental involvement and availability.

6.2 General trends on father parental involvement

Not so much different from the “Botswana Core Welfare Indicators Survey” (2009/10), and also reported by Garey and Townsend (2006), about 45% of the current sampled population were raised in female single headed families, all the time or at-least a considerable part of their childhood. Statistics for 1993/94 also shows that even then, 45% of the household was female single headed (also from “Botswana Core Welfare Indicators Survey” (2009/10)). This is probably true historically which suggests that Botswana culture generally relies less on male input for security in rearing children than most Western cultures do. If that is the case then paternal investment may well have less impact on high-K reproductive strategies than in Western cultures. This may offer some explanation why the Life History Theory could not be supported. To give a picture of the varieties of family compositions particularly the father's availability, of these 45% of families which are either completely female headed or have a father figure available some of the times, some of them have step fathers as the father figure, while some have other related male playing the father role.

6.2.1 Stepfather presence

Men, unlike women are often inclined to choose mating effort over parenting effort, while women choose vice versa (Trivers, 1972). Thus it is not surprising that Anderson (1998) proved that men will invest more in their current mate's offspring. In the absence of a biological father, another male who comes in as a mother's new partner may actively take the headship of the family as a stepfather. From about 45% of the female single headed families reported, some of these had stepfather at some point in life. As recorded, a considerable percentage of the sample (around 12%, n=209) was raised by step fathers.

6.2.2 Other related male figure in the household

A considerable number (around 16.7%, n=209) of the sampled females had other male relative who played the role of a father in their lives. These could be uncles, grandfathers, and elder bothers. This gives a picture of prominent different kinds of family headship, besides the biological father in Botswana. Like many other developing African countries, Botswana is experiencing a shift in family settings or living arrangements. Traditionally, the extended family was a common living arrangement in Botswana, and this is disintegrating. This may give a plausible explanation as to why the proposed Life History Model does not fit into the Batswana females. A father's role could be cued differently within the Botswana context as

compared to the western culture. As common as it is, experienced over years through lived and observed experiences that most females are heading the household, girls may be cueing fathers' availability as unimportant. Hence, this may not mark any difference in girls 'choice' of reproduction strategies.

6.2.3 Age at menarche

Age at menarche is important as it relates to subsequent sexual developments. The timing may similarly have some effects on the later physical as well as physiological development. For instance, early menarche is a pre-cursor of early menopause as well as increased chances of acquiring some types of cancers like the breast cancer (Kampert, Whittemore, & Paffenbarger, 1988 as cited in Ellis & Garber, 2000). While age at menarche is reported to be significantly declining across cultures, the general age at menarche is reported to be around 13 years. In Western European countries and the US, average age at menarche is around 12 years (Culpin et al., 2015; Parent et al., 2003, as referred by Culpin et al., in 2003, Quinlan had found an average age at menarche to be 13 for a sample drawn from 10 847 women in the US. In the current study sample, the average age at menarche reported was 15.1 years. The age at menarche difference between the sample at study and other samples leaves a lot to be desired. In trying to discern this, what emanates is whether this is the actual average age at menarche for this sample in Botswana or whether there was recall bias at play. It has been noted before that even though recall bias may be an impingement to retrospective data, simple sociodemographic data retrieval has been found to be accurate up to 50 years later (Berney & Blane, 1997, as referred by Quinlan 2003). Even with the confidence in memory retrieval noted by Berney and Blane (1997), a lot of assumptions still remain. For instance, one may argue that age at menarche may not necessarily be such an important date to imprint in memory within the context of Botswana culture. Even so, this age at menarche reflects the age at menarche at roughly 16 years ago. As the sample average age was 31 years, the age at menarche with an average of around 15, implying that this sample's menarche averaged to about 16 year ago. A question remains to whether this is a true reflection of the sample of women in Botswana at that time. There has been significant decline in age at menarche over the past 100 years (Hochberg, Gawlik, & Walker, 2011). This is explained as a response to better nutrition and life expectancy in juveniles in the modern industrialised communities. According to the Life History Theory, late age at menarche exemplifies the higher end of the Differential-K continuum. Using the theory, the expectations are that the age at menarche should be lower than recorded. The current reported living arrangements as well as previous

reports reveal that most households are female single headed, and some of the male household heads are not necessarily the biological father, yet the sample is also exemplifying a higher end of Differential-K in terms of age at menarche. These results are not in line with the Life History Theory's associating fathers' paternal involvement and availability with slowing the reproductive strategies. Here, there could be another potential variable responsible for age at menarche.

6.2.4 Sexual debut

The reported range of age at first sex was 7 to 31 years. A majority of the sample reported age at first sex to be 19 years. Age of consent to sexual activities is set at 16 years in Botswana (Fox *et al.*, 2013). The average age at first sex recorded was higher than the 'allowed' age of consent to sexual activities. When comparing the current results with other Western studies on age at sexual debut, Quinlan (2003) found that average age at first sex was 17 years within a sample of women in the US.

A study on contemporary patterns of adolescent sexuality in Botswana (by Meeker & Ahmed, 2000) shows an early age for sex debut. Males were found to be engaging in sex earlier than female. It was estimated that between the ages of 16-17, out of every seven females, one would be sexually experienced and that at 17 a majority would have had a sexual experience. One of the possible explanation for this finding lies in that if in Botswana, sexual activity in women is laden with social prejudice, it is possible that women in responding to surveys on sexuality may tend to raise their ages at which they experienced their first sex. And while for men, as also exemplified in Meeker and Ahmed's (2000) findings, their (man's) status could be elevated by false reports of early engagement in sexual activities, hence for them ages at first sex experiences may be higher than women of the same age group, which in reality may not be the case.

6.2.5 First pregnancies and childbearing

The mean age at first pregnancy for the current study is 22.8 while for first child birth is 23.2. In the US, around 2003, the age at first birth was averaged around 21. Assumptions made are that due to contraceptive use, young ladies can still engage in sexual activities without getting pregnant until late enough whenever they feel ready to have children. Secondly, although the majority of the participants were brought up in villages, Botswana has had good primary health care, and as early as 1973, the Ministry of Health had introduced family planning

programme which seemed very efficient in reducing births (VanderPost, 1992). Hence, it is not surprising to see a higher mean ages for both first pregnancies and first child bearing as compared to the first world countries like the US. One possible explanation for this is that the population in Botswana could be launching off later than other developed worlds. For instance, Ellis et al. (2003) recorded the 17 years as the average age at completion of the 13 year schooling. If on average, children in Botswana complete their basic 12 year education at around 18 years, and start college studies at around 19 years, they are expected to put off child bearing for later years once they have completed their studies. Or those (Botswana) who do not proceed to college still have options for delayed child birth as well as starting families a little later and older than other Western counterparts who at the equivalent level at college are younger. The obtained age at first pregnancy and childbirth here suggest that the sample used seems to be at the higher end of Differential-K as age at first child is later than other recorded peers.

6.2.6 Female parental investment

About two decades ago, the total fertility rate of Botswana females was at 5 and this was feared to double the population which was improving on mortality rate (VanderPost, 1992). In the current study, the sample fertility rate is at 1.6 with a range of 4. There is a big difference between the current fertility rates found in the study and that reported around 24 year ago. There are two possible explanations to this low fertility rate. Firstly, the mean age for the sample (31 years) can still be considered as just at the prime age for child birth, and that the participants would possibly have more number of children in the future. Secondly, as also mentioned for age at first pregnancy and first child birth, the population of Botswana has long been introduced to effective family planning methods as early as 1973. "Botswana's total fertility rate (TFR) continues to decline from a high of 6.6 children per woman in 1981 to 3.3 in 2001 and to 2.8 children per woman in 2011". There is a notable recorded decrease in fertility in the young ages of 15 and 29 (Bainame & Letamo, 2015, p 37). This too may already suggest that the Botswana population, from which the study was sampled, is at the higher end of the Differential-K. Hence, it is also not surprising to record such a low fertility rate. This study sample was also mainly sourced from the capital city; therefore, a smaller fertility could be expected as there could be low fertility rate in urban based families as compared to females from the rural areas.

6.2.7 Sexual partnering trends

The range of number of sexual partners a female has ever had was none up to 60 partners. The average fell at 4 sexual partners. However, it is worth noting that the average number of partners may be elevated by the extremes. The average lifetime sexual partners averaged to 3 in a sample of women in the US (Quinlan 2003).

6.3 Father parental involvement versus female reproductive strategies

Like many other studies conducted before (e.g. Udry & Cliquet, 1982; Ellis & Garber, 2000), the current study revealed that father absence and father parental involvement does significantly predict earlier age at menarche. Age at menarche was even more significantly predicted by stepfather presence. Females with stepfathers as father role players showed significant odds ratio of .570 which suggests that step father presence reduces the odds for age at menarche. Switching from no male parental figure to stepfather presence decreased the odds of menarche by 43%. Lack of parental accessibility cues girls to reach menarche early. Having had not been raised by both parents raised the odds for early age at menarche. To explain this using the model shown in *Figure 1*, when a father is not involved and not present, the girl child is inclined to follow the lower end of the Differential-K and accelerated reproductive strategy is 'used' as they reach menarche earlier than their peers. Intriguingly, stepfather presence was seen as affecting age at menarche whereby females who were brought up by stepfathers reached menarche significantly earlier. Known to them that their fathers were unavailable, and that other men fathered them, their reproductive strategies are accelerated as they cue men as unreliable. These findings also discredit the notion of dual parenting as advantageous in terms of slowing down reproductive strategies due to its benefits. The pheromones theory has often been used to explain how stepfather presence could affect age at menarche. That is, the stepfather as an unrelated male is thought to be releasing pheromones which may affect the unrelated step-daughter by accelerating maturation so as to ready them for mating. This could be a more feasible explanation to the link between stepfather presence's roles on accelerating menarche.

These results were not consistent with other findings on role of fathers' involvement and availability on menarche timing such as that of Ryan (2015). Ryan (2015) did not find any significant association between father presence and age at menarche among the Caribbean girls of curacao. Also in another study, Sheppard et al. (2014) did not find any significant

effects of father absence in age at menarche. The differences in findings between the current study and others could be due to other factors such as culture and environment.

6.3.1 How father accessibility as well as parental involvement affect sexual debut, ages at first birth pregnancy and first birth.

The Life History Theory also reasons that father absence cues men as unpredictable; gets the girl child to expend efforts on current reproductions. We had anticipated a significant difference between females who had fathers available in their upbringing and those who did not. However, there was no significant relationship found as sexual debut could not be significantly predicted by father parental involvement or father accessibility. The reported average age at first sex was notably higher than previous reports and suggested a slowed reproductive strategy approach or higher-K. Just as shown in the reproductive strategies trends, it is possible that another factor is much more important in cuing for slowed reproductive strategies besides fathers' parental involvement and accessibility. It has been decades since living arrangements in Botswana were recorded with almost half the population without fathers and father figures (Garey & Townsend, 1996; BBotswana Core Welfare Indicators Survey, 2009/10). Therefore, the efficacy of the father's role on daughters' sexual strategy may have evolved as their availability and involvement has been indifferent.

The expectations that father absence as well as parental involvement would significantly cue for earlier age at first pregnancy and at child birth was not met. Here too, like for sex debut, the Life History Theory was not supported as well as several other studies reported.

As observed, the age at first pregnancies notably displayed a higher-K strategy. Father parental involvement is not the only factor that may have a role in timing of birth. A low infant mortality rate as well as higher life expectancy also promotes higher-K strategy. UNICEF Botswana informs that Botswana's infant mortality is estimated to be 17 to 1000 live births (Retrieved from; <https://www.unicef.org/botswana/nutrition.html>). These substantially low infant deaths are possible explanation to the higher-K observed in the current study. Females who live in this kind of environment where children are less likely to die will find it safe to spend in self-maintenance and reproduce later and this is a more plausible explanation than mere father parental involvement and accessibility.

Sexual partnering was significantly predicted by the Total Father Parental Involvement scale. The less the total father parental involvement measured, the likely females would engage in multiple partnering. Unlike the other components of the reproductive strategies (besides age

at menarche) which were explicated by higher-K end, sexual partnering significantly followed the lower-K end when predicted end when predicted with Total Father Parental Scale. In this current study, categories of parental involvement were adapted from Lamb (1986) and these included accessibility of the father (whether father was present or absent), direct interaction of the father with the child and responsibilities of the father.

The number of offspring born to female could be significantly predicted by father availability and involvement. Here again, we observe a support to the Life History Theory whereby the father absence and low paternal involvement follows a lower-K end. However, father parental involvement and accessibility could not predict parental effort explicated by length of breastfeeding and child spacing. Father absence has been linked to shortened length of breastfeeding (Quinlan, Quinlan, & Flinn, 2002). However, there was no significant difference in terms of length of breastfeeding observed.

7 Conclusions

This current study investigated the role of fathers' parental involvement and availability on females' reproductive strategies. Where previous reports reveal high percentages of households that run without father figures in Botswana over decades, it was then hypothesized that father absence would play a role in predicting a disparaged approach that is characterized by lower-K end. Explained by the Life History Theory, father absence and lack of involvement was expected to promote an accelerated reproductive strategy in females. This is because females with absent and uninvolved fathers cue their environment (particularly men in the scope of this thesis) as unpredictable and therefore they engage in several trade-offs. Self-maintenance is traded-off to early reproduction, future reproduction is traded-off to present reproduction, quality offspring is traded-off to quantity, and parental effort traded off to mating effort.

However, several observations were made with this study. The sample displayed trends of reproductive strategies that are more inclined towards the higher-K end of the Differential-K. The reported age at menarche was higher than for previously recorded in other studies, average age at sex-debut was also late. Average ages at first pregnancies and first child births were also higher and the average number of offspring was smaller as compared to other studies. From the Life History Theory derived propositions initially presented, only two of the reproductive strategies could be predicted by fathers' presence and involvement; that is age at menarche and number of offspring. Father parental role and accessibility can predict age at menarche as informed by Life History Theory. Number of offspring is also related to fathers' availability as well as accessibility, much more importantly, total absence of a father in females' childhood significantly raises the number of their offspring. Stepfather presence in females' upbringing was the most important predictor of age at menarche. In conclusion, fathers' parental involvement and accessibility may play a role in cuing for some of the components of reproductive strategies in a sample that is already on the higher-K end. Other factors promoting higher-K end may play much role in the reproductive strategy outcome in females. That is females who live in predictable environments which will promote higher-K end, such as high life expectancies, low infant mortality rates may not necessarily be affected by fathers accessibility and involvement in their strategies route choices.

7.1 Strengths and limitations of the study

The strength of this current study lies in the fact that it was the first of its kind to consider the role of father accessibility and father parental involvement on female reproductive strategies with a sample from Botswana. Therefore, the results of this study may add to the body of knowledge pertaining to this topic.

It is evident from literature that the timing of father absence is an important factor in predicting sexual strategies, however, we did not cater for such categories and this may have affected the outcome of the results. Asking for father presence as well as involvement before the age of 5 would have proved a difficult task to the sampled participants as this was based on retrospective memory.

It is also worth noting that although most of the results reported did not show much significant differences between females brought up with an accessible father or not, as well as with a parentally involved father or not, there were often almost significant. Thus, we propose that retrospective memory was a possible factor nullifying the results where possibly estimates were noted rather than actual trends. Another nullifying factor at play could be the lie factor. As mentioned, there were some potential participants who turned down the questionnaire due to the acclaimed confidential nature of the questions. Possibly, a significant number of participants may have adjusted their answering towards a much more socially acceptable form. If this is the case, it is not surprising to obtain significant results for predicting age at menarche with father parental involvement and non-significant results, although almost significant for other reproductive strategies. A respondent may easily and truly record their age at menarche, although memory may also work against this. This is because age at menarche is not really much laden with social expectations as compared to the subsequent reproductive strategies. In responding to sex debut, age at first pregnancy, age at first child and sexual partnering behaviors, impression management may have played a role. Although the authors had considered social desirability, the results which are almost always almost significant may imply that stricter measures against social desirability should have been taken into consideration. The author had attempted to curb social desirability by administering the questionnaires in groups, whereby, the idea was to nullify response-responder matching, at least in the eyes of the responder as they had to drop them into the box at the end of the study. However, spacing in between the seated respondents was not

carefully decided. Anyone who may have felt their responses may be visibly viewed by the neighbor may have been compelled to impress.

7.1.1 Recommendations

7.1.1.1 For future studies

Possible amendments that could improve this study include carrying out a longitudinal study to assess father accessibility as well as father parental involvement in the in progress. Thus longitudinal design will improve on the possible truth lost due to retrospective data, and would also make it possible to follow the family environment and changes across time from young ages. At a later age in life, people may have forgotten their exact ages at menarche, their first sex etc. However, if this data is collected in progress in longitudinal study, such will be corrected.

It is important to note that self-scoring for father parental involvement is an objective measure and may be affected by several things. One subject may consider their father parental involvement in relation to their societal or cultural views and expatiations of a father. If for instance a female is asked to rate their father's parental involvement, and the society she grows up with is characterized by a common father absence phenomenon, the outcome scores measured may not necessarily mean the same thing with a different culture/society. In the current study we assume that a typical Botswana father would need to play marginal role in the upbringing of their children in order to be termed involved and accessible.

Father absence is also a phenomenon common in lower socio-economic classes. Poverty is also often associated with having effect on reproductive strategies. However, poverty does not only affect reproductive strategies but many other aspects of life (Ellis et al., 2003).

The observed relationships between father presence and accessibility are also deemed unclear since homes with absent fathers also tend to be poor homes (Parke, 2004). A single female-headed family often means lesser financial income for the family and this also imply that time and resources are limited (Quinlan, 2001). For future studies, it would be important to control for poverty when investigating the relationship between father parental involvement and accessibility on females' reproductive strategy.

7.1.1.2 *Policy Implications*

Although this study is partially inconclusive about the role of father parental involvement on reproductive strategies, the instances where females with absent fathers were seen to be significantly cued to accelerated strategies do suggest that father accessibility and father parental involvement is crucial in the upbringing of a female child. The chances for early menarche are increased for females brought up by fathers displaying low parental involvement and also stepfather presence. Earlier menarche is a precursor to negative physiological outcome; medically it increases odds for one getting cervical cancers (Louie et al., 2009). Culpin, Heron, Araya and Joinson, (2015) had also concluded that early menarche is a mediating factor between father absence and depressive symptoms. Also, since it is also thought to be the calibrator of subsequent reproductive strategies, its early onset should be discouraged where possible. Policy makers are thus encouraged to draw up policies that will promote dual parenting. Although it may seem a small matter to consider, in a broader context, the implications for earlier menarche may be more adverse than thought. Botswana is considered to be one of the countries with a population that is seriously challenged by HIV/AIDS. Any little loophole that may be a pathway for HIV/AIDS must be sealed in order to succeed with winning the pandemic. Whatever the explanation and the subsequent reproductive routes, several others and theorist (e.g. Udry & Cliquet, 1982) agree that earlier menarche sets girls/women on the path to an accelerated reproductive strategy. If early menarche makes children fecund and thus sets them ready for sexual debut earlier than they can make responsible choices for sexual partnering, let alone for contraception use, these females, who mature earlier will find themselves in such position. Hence, father parental involvement and accessibility should be rallied for in policy making and implementations

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Appendix 1



Dear Participant,

Re: Research on how fathers impact their daughters

I am a student enrolled in Masters in Research Psychology. I am studying how fathers affect their daughters' lives. Please volunteer to answer the attached questionnaire. It will take you about 15 minutes. **Your participation is voluntary and confidential;** you are not expected to write your names anywhere. No harm should come from answering this questionnaire; however, if you feel somehow disturbed by answering these questions, you are free to stop answering **without any consequences**. If you feel that you need some help, we have arranged for counselling with Emang Basadi Women's Association (Tel: 3909335) and we will pay your transportation fees.

There is no payment for participating; but you will help me and also increase knowledge about fathers and daughters in the society. We are planning to have a feedback session where we will tell you the results and you tell us your opinion. The results of this study will be sent to a scientific journal where other researchers can access them. Your name or contacts is not stored with any of the forms and no one will be able to match your responses with your filled form.

My supervisor is more than willing to answer any additional questions.

Thank you for your assistance.

Tlotlo Cousy Thutoemang

Tel: 72973456/ +27 0780269746

Supervisor: Prof L. Lachenicht

Tel: +27 (0)33 260 1111

Email: lachenicht@ukzn.ac.za

P/Bag X01 Scottsville

Pietermaritzburg, 3209

South Africa

I have read, understood and consent with the above information. Therefore, I **voluntarily** agree to take part in this survey, I understand that I am free to cease participating at any time after the study has started.

Participant's signature

Date

Please write your contacts below if you would like to take part in the feedback session so that we contact you. Tear off on the line above and hand separately to the researcher.

Cell phone: _____

Email address: _____

Please answer the following questions by making a tick (✓) in the box next to the answer that best reflects on you.

SECTION A

The following questions are about you and your father.

1. I was raised in a female single headed family (e.g. mother only, other female relatives).
 - a) ☐ Almost all the time
 - b) ☐ Some of the time
 - c) ☐ Not at all
2. I was raised by both parents (mother and father).
 - a) ☐ Almost all the time
 - b) ☐ Some of the time
 - c) ☐ Not at all
3. The person who played the role of a father in my life was?
 - a) ☐ My biological father
 - b) ☐ My stepfather
 - c) ☐ My adoptive father
 - d) ☐ Other male relative (e.g Grandfather)
 - e) ☐ I never had a male figure in my life.
4. I grew up with the father figure I indicated in question 3 living in the same home with me.
 - a) ☐ Almost all the time
 - b) ☐ Some of the time
 - c) ☐ Not at all

Questions 5 to 14 are about you and the person who played the role of a father that you have indicated in question 3.

For example, if you indicated that your father figure was your grandfather, your responses about your 'father' in question will be about you grandfather. If you were raised by a single female parent, indicate -not applicable

5. My father helped me with my schoolwork.

- a) ☐ Always
 - b) ☐ Sometimes
 - c) ☐ Never
 - d) ☐ Not applicable
6. My father would pay attention to my grievances.
- a) ☐ Always
 - b) ☐ Sometimes
 - c) ☐ Never
 - d) ☐ Not applicable
7. I felt my father's love.
- a) ☐ Always
 - b) ☐ Sometimes
 - c) ☐ Never
 - d) ☐ Not applicable
8. My father cared to know my whereabouts, (Where I would be at any given time).
- a) ☐ Always
 - b) ☐ Sometimes
 - c) ☐ Never
 - d) ☐ Not applicable
9. My father had interest in my general or social life matters.
- a) ☐ Always
 - b) ☐ Sometimes
 - c) ☐ Never
 - d) ☐ Not applicable
10. Whenever I was wrong in my father's presence, he would discipline me.
- a) ☐ Always
 - b) ☐ Sometimes
 - c) ☐ Never
 - d) ☐ Not applicable
11. My father cared about whatever I did.
- a) ☐ Always
 - b) ☐ Sometimes
 - c) ☐ Never
 - d) ☐ Not applicable
12. My father rewarded me whenever I behaved well.
- a) ☐ Always
 - b) ☐ Sometimes
 - c) ☐ Never
 - d) ☐ Not applicable
13. My father supported me financially (e.g. bought school uniforms, bought food at home).
- a) ☐ Always

- b) ☐ Sometimes
- c) ☐ Never
- d) ☐ Not applicable

14. My father financially neglected me.

- a) ☐ Always
- b) ☐ Sometimes
- c) ☐ Never
- d) ☐ Not applicable

15. My mother and father were married.

- a) ☐ Yes
- b) ☐ No

SECTION B

16. How old were you when you experienced your first menstrual periods?

17. Have you ever engaged in sexual activities?

- a) ☐ Yes
- b) ☐ No

Please go to question 29 if you responded (NO) to question number 17.

18. How old were you when you had your first sexual contact?

19. How many sexual partners have you had?

20. What is your ideal or desired number of sexual partners at a time?

21. Have you ever had more than one sexual partner at the same time?

- a) ☐ Yes
- b) ☐ No

22. How many children do you have if any?

Please skip question 22 to 26 if you do not have a child.

23. How old were you (in years) when you had your first pregnancy?

24. How old were you (in years) when you had your first Child?

25. How are your children spaced in terms of age? You may extend the rows if you have more than 5 children.

	Difference in age (Number of years)
1 st and 2 nd born	
2 nd and 3 rd born	
3 rd and 4 th born	
4 th and 5 th born	

26. How long (in months) did you breastfeed each of your children?

	Number of months the child was breastfed
1 st child	
2 nd child	
3 rd child	
4 th child	

27. Do your children have the same father?

a) ☐ Yes

b) ☐ No

28. How many siblings do you have (brothers and sisters)?

29. What is the age difference between your mother and her first born?

30. What is your age in numbers?

31. Where did you mainly grow up?

a) ☐ City

b) ☐ Town

c) ☐ Village

d) ☐ Cattle Post/lands

32. What is your marital status?

a) ☐ Never married

b) ☐ Now Married

c) ☐ Divorced

d) ☐ Widowed

e) ☐ Separated

f) ☐ Cohabiting

33. What is your highest degree or level of education?

a) ☐ Never went to school

b) ☐ Primary school

- c) ☐ Secondary school
- d) ☐ College certificate
- e) ☐ Diploma
- f) ☐ Degree
- g) ☐ Master's degree

34. Write a sentence describing your relationship with your biological father.

35. Write a sentence describing your relationship with your mother.

36. Write a sentence describing your relationships with men.

Thank you for your assistance

Appendix 2

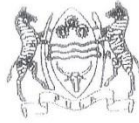
<http://fluidsurveys.com/surveys/cousy/research-on-how-fathers-impact-their-daughters/>

Appendix 3

TELEPHONE: (267) 3133658

FAX: (267) 3907950

REFERENCE: DHMT



REPUBLIC OF BOTSWANA

Gaborone District Health Management
P.O.Box 258
GABORONE
BOTSWANA



DATE: 21/11/13

To:

Nurse Incharge

Bonteng Village / E812

RE: PERMISSION FOR PLACEMENT OF STUDENTS

This serves to inform you that permission has been granted for *Thato Cosy Mubemang*
to be attached to your clinic for practicing as part of curriculum requirements. Their
attachment will be from *25/11/13* to *06/12/13*.

M M Mathuba / For DHMT Coordinator

Appendix

4



Office of the Deputy Vice Chancellor (Academic Affairs)

Office of Research and Development

Corner of Notwane and Mobuto Road, Gaborone, Botswana
 Pvt Bag 00708 Gaborone, Botswana
 Tel: [267] 355 2900 Fax: [267] 395 7573
 E-mail: research@mopipi.ub.bw

Ref: UBR/RES/ETHI/081
 X-REF: UB/RES/ETHI/07

27th November 2013

Tlotlo.Cousy.Thutoemang
 School of Applied Human Science
 Discipline of Psychology
 University of KwaZulu-Natal

RE: "PERMISSION TO CONDUCT RESEARCH WITHIN UB AND EXEMPTION OF RESEARCH PROJECT FROM RESEARCH PERMIT REQUIREMENTS"

Project Title : **"The Role Of Father's Parental Involvement In Female Reproductive**

Strategies: The Case Of Botswana."

Researcher(s): Tlotlo. Cousy. Thutoemang

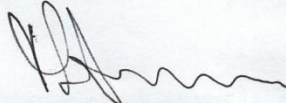
I am glad to advise that approval has been granted for the above study to be conducted at UB. Since the study is to be conducted within the confines of UB, the study has accordingly been exempted from Government Research Permit requirements. In reaching the above decisions, it was noted that the above study involves minimal risk and is being conducted as part of Research Methodology training efforts. Before proceeding with the study, the student is required to ensure the following:

- **The study will only be conducted within the confines of UB following the approved proposal version.**
- **No interviews will be conducted with any official or individual outside UB as part of the study.**
- **Informed consent will be sought from all respondents**
- **Permission will be sought from UB authorities as necessary.**
- **APPROVAL DATE** : 27th November 2013
- **EXPIRATION DATE** : This approval expires on 27th November 2014
 After this date, this project may only continue upon renewal. For purposes of renewal, a progress report should be submitted to ORD one month before the expiration date.
- **REPORTING OF SERIOUS PROBLEMS:** All serious problems impacting on study quality and progress (whether expected or unexpected) must be reported to ORD within 10 days.
- **MODIFICATIONS:** Prior approval is required before implementing any significant changes to the protocol.
- **TERMINATION OF STUDY:** On termination of this study, a report has to be submitted to ORD.

www.ub.bw

- **QUESTIONS:** Please contact Office of Research Development ext 2911 or 2900.
- **Other:**
 - **The researcher may accordingly proceed with the above study after fulfilling the above requirements.**

Kind regards.



Prof Isaac.N. Mazonde

Director, Office of Research and Development



Appendix 5



Motsaya karolo

Patlisiso ka kamano ya rrangwana le ngwana wa gagwe wa mosetsana.

Ke moithuti wa Masters in Research psychology. Ke dira ditshekatsheko tsa ka fa rrangwana aka amang botshelo jwa ngwana wa gagwe wa mosetsana ka teng. Ke kopa thuso ya gago go tlatsa pampitshana ya dipotso e e latelang. Go ka tsaya lobaka lwa metsotso ele lesome le botlhano go e tlatsa. Go tsaya karolo mo ke ga boitlhaopo, ebile dikarabo tsa gago di tlaa nna sephiri sa gago ka osa letlelelwe go kwala leina la gago gope. Ga re solofele fa go ka nna le bothata bope bo bo ka bakiwang ke go araba dipotso tse. Lefa go ntse jalo, fa go ka diragala gore o tshwenngwe ke dingwe tas dikarabo, re dirile dithulaganyo le ba Emang Basadi (mogala: 3909335) kwa o ka boning thuso gone. Re tlaa go thus aka madi a sepalamo.

Ga gona dikatso dipe fa o itlhaopile go araba. Lefa go ntse jalo, dikarabo tsa gago di tlaa nthusa ebile di thuse go oketsa kitso ka borre le bana ba basetsana mo sechabeng. Re eletsa go ka nna le bokopano jo re tlaa bo re buisana ka ditshedimosetso tsa patlisisos e, mme re ka eletsa go tsaya maikutlo a gago ka se re tlaa bo re se sedimosetswa ke patlisiso e. Maduo a patlisiso e a tlaa gatisiwa mo dibukeng tsa dipatisiso kwa basekaseking ba bangwe ba ka a bonang gone. Maina le dinomoro tsa gago tsa megala ga di bewa gammogo le panpiri ya dipotso, ka jalo, ga gona ope yo o ka itseng dikarabo tsa gago.

Mookamedi wame o iketleeditse go ka araba dipotso tsotlhe ka ga patlisiso e.

Re lebogela thuso ya gago.

Tlotlo Cousy Thutoemang

Tel: 72973456/ +27 0780269746

Mookamedi: Prof L. Lachenicht

Tel: +27 (0)33 260 1111

Email: lachenicht@ukzn.ac.za

P/Bag X01 Scottsville

Pietermaritzburg, 3209

South Africa

Ka go baya setlanyo,

Ke badile, kea tlhaloganya ebile ke dumalana le se se kwadilweng fa godimo. Ka go rialo, ke dumalana le go itlaopa go tsaya karolo mo patlisisong e. Ke tlhaloganya gore ken a le tetla ya go ka emisa go tlatsa pampitshana e mo lebakeng lepe fa ke eletsa.

Setlanyo sa motsaya karolo

letsatsi

O ka kwala dinomoro tsa megala kgotsa enthanete gore re tle re kgone go buisanya le wena ka bokopano bo re tla a bo re bua ka maduo a tshekatsheko e fa o eletsa go nna teng. Kgagola fa moralong o o fa godimo o bo o di busa difarologanye.

Mogala: _____

Email address: _____

Tswee tswee araba dipotso tse dilatelang ka go tshwaya (v) mo lebokosong le le bapileng le karabo ya gago.

Karolo A-Dipotso tse di latelang ke tse di mabapi le wena le rre rrago.

37. Ke godisitswe ke mme a le esi (Kgotsa mongwe wa losika wa mme jaaka mmangwane).
- a) ☐ Bontsi jwa dinako
 - b) ☐ Nako tse dingwe
 - c) ☐ Nyaya
38. Ke godisitswe ke batsadi bame botlhe (mme le ntate)
- a) ☐ Bontsi jwa dinako
 - b) ☐ Nako tse dingwe
 - c) ☐ Nyaa
39. Motho yo o nkgodisitseng jaaka motsadi wa rre ke_____.
- a) ☐ Ntate wa matsalo (biological father)
 - b) ☐ Ntate yo eseng wa matsalo (step- father)
 - c) ☐ Ntate yo o nkgodisitseng (Adoptive father)
 - d) ☐ Rre mongwe wa losika (jaaka ntatemogolo, malome)
 - e) ☐ Ke goletse mo lelwapemng le le senang motsadi wa rre.
40. Ke godisitswe ke motsadi wa rre yo ke mo tshwaileng mo **potso 3** a nna le nna.
- a) ☐ Bontsi jwa dinako
 - b) ☐ Nako tse dingwe
 - c) ☐ Nyaa, o ne a sa nne le nna

Dipotso 5 go ya kwa go 14 ke tsa botsalano jwa gago le le rre yo o mo tshwaileng mo potso 3 fa ele ene motsadi wa rre yo a go godisitseng.

Fa o godisitswe ke motsadi wa mme a le mongwe, araba-ga ke a nna le motsadi wa rre.

41. Ntate one a nthusa go dira tiro ya sekolo.
- a) ☐ Bontsi jwa dinako
 - b) ☐ Nako tse dingwe
 - c) ☐ Nyaa
 - d) ☐ Ga ke a nna le ntate
42. Ntate one a reetsa matshwenyego ame.
- a) ☐ Bontsi jwa dinako
 - b) ☐ Nako tse dingwe
 - c) ☐ Nyaa
 - d) ☐ Ga ke a nna le ntate
7. Ke itse gore ntate o ne a nthata.
- a) ☐ Bontsi jwa dinako
 - b) ☐ Nako tse dingwe
 - c) ☐ Nyaa
 - d) ☐ Ga ke a nna le ntate
8. Ntate one a rata go itse kwa ke leng teng .
- a) ☐ Bontsi jwa dinako
 - b) ☐ Nako tse dingwe
 - c) ☐ Nyaa

- d) ☐ Ga ke a nna le ntate
9. Ntate one a kgatlhegela go itse ka botshelo jwa me le gore ke tsalana le bo mang.
- a) ☐ Bontsi jwa dinako
- b) ☐ Nako tse dingwe
- c) ☐ Nyaa
- d) ☐ Ga ke a nna le ntate
10. Ene ere fa ke dirile phoso, ntate one a nkgalemela (nkotlhaya).
- a) ☐ Bontsi jwa dinako
- b) ☐ Nako tse dingwe
- c) ☐ Nyaa
- d) ☐ Ga ke a nna le ntate
11. Ntate one a kgathale ka tse ke di dirang.
- a) ☐ Bontsi jwa dinako
- b) ☐ Nako tse dingwe
- c) ☐ Nyaa
- d) ☐ Ga ke a nna le ntate
12. Ntate o ne a nkakgola fa ke dirile sentle.
- a) ☐ Bontsi jwa dinako
- b) ☐ Nako tse dingwe
- c) ☐ Nyaa
- d) ☐ Ga ke a nna le ntate
13. Ntate o o ne a ntlhokomela ka go mpha madi. (jaaka go reka paka ya sekolo, go reka dijo mo lwapeng).
- a) ☐ Bontsi jwa dinako
- b) ☐ Nako tse dingwe
- c) ☐ Nyaa
- d) ☐ Ga ke a nna le ntate
14. Ntate one a sa mphe madi.
- a) ☐ Ee o ne a sa mphe madi
- b) ☐ Nako tse dingwe
- c) ☐ Nyaa , one a mpha madi
- d) ☐ Ga ke a nna le ntate
15. Ntate le mme ba ne ba nyalane fa ke gola.
- c) ☐ Ee
- d) ☐ Nyaa

Karolo B

16. O ne o le dingwaga tse kae fa o simolola go bona setswalo (menstruation)?
- _____
17. Aa o kile wa tlhakanela dikobo?
- a) ☐ Ee
- b) ☐ Nyaya
- Fa o arabile ore 'nyaya' mo potsong e e fa godimo (potso 17), tlolela ko go potso 28 mme o simolole go araba teng.***
18. O ne o le dingwaga di le kae fa o tlhakanela dikobo la ntlha?

19. O tlhakanetse dikobo le batho ba ba farologanyeng ba le kae mo lebakeng le le fetileng?

20. Go ya ka wena, mo nakong ele nngwe, o ka eletsa go nna le bakapelo ba le kae?

21. Aa o kile wa nna le bakapelo ba feta bongwe ka nako ele nngwe?

a) ☐ Ee

b) ☐ Nyaya

22. O na le bana ba le kae?

Tlola potso 23 go ya kwa go 27 fa o sena bana.

23. O ne o le dingwaga di le kae fa o ima kgotsa o itsholofela lantlha?

24. O ne o le dingwaga tse kae fa o nna le ngwana wa ntlha?

25. Bongwanake ba faroganye ka dingwaga ka mo go latelang. O ka oketsa lebokoso fa ba feta botlhano.

Pharologanyo magare ga ngwana-	Pharologanyo ya dingwaga
Wa ntlha le wabobedi	
Wabobedi le waboraro	
Waboraro le wabone	
Wabone le wa botlhano	

26. O amusitse bana ba gago sebaka se se kae. Kwala dikgwedi.

	Sebaka se ngwana a amuleng lebele (ka dikgwedi)
Ngwana wa ntlha	
Ngwana wa bobedi	
Ngwana wa boraro	
Ngwana wa bone	
Ngwana wa botlhano	

27. Aa bana ba gago ba na le rraabone a le mongwe?

a) ☐ Ee

b) ☐ Nnyaya

28. O na le bomonao le bomogoloo ba le kae ka palo?

29. Mme mmago le ngwana wa gagwe wa ntlha ba farologana ka dingwaga di le kae?

30. O dingwaga di le kae?

31. O goletse kae bontsi jwa nako?

- a) ☐ Toropo (jaaka Gaborone, Francistown)
- b) ☐ motse setoropo (jaaka Jwaneng, Selibe Phikwe)
- c) ☐ Motse (jaaka Kanye, Maun)
- d) ☐ Masimo kgotsa moraka

32. Seemo sa gago sa lenyalo ke sefe?

- a) ☐ Ga ke ise ke nyalwe
- b) ☐ Ke nyetswe mo sebakeng seno
- c) ☐ Ke tladile/tladilwe
- d) ☐ Ke moswagadi
- e) ☐ Ke kgaoganye le monna yo re nyalaneng mme ga re a tthalana
- f) ☐ Re nna mmogo mme ga re a nyalana

33. Dithuto tsa gago tse di kwa godimo ke dife?

- a) ☐ Ga ke a tsena sekolo
- b) ☐ Sekolo se se potlana
- c) ☐ Sekolo se segolwane
- d) ☐ College certificate
- e) ☐ Diploma
- f) ☐ Degree
- g) ☐ Master's degree
- h) ☐ Doctoral degree

34. Kwala seele o tthalose ka fa o tsalanang ka teng le rre rrago wa matsalo (biological father). (Fa ele gore o tlhokafetse, le ne le tsalana jang fa a santse a tshela?)

35. Kwala seele o tthalose ka fa o tsalanang ka teng le mme mmago. (Fa ele gore o tlhokafetse, le ne le tsalana jang fa a santse a tshela?)

36. Kwala seele o tthalose ka fa o tsalanang ka teng le borre.

Re lebogela thuso ya gago.

Appendix 6



29 January 2014

Ms Tlotlo C Thutoemang (213569746)
School of Applied Human Sciences - Psychology
Pietermaritzburg Campus

Protocol reference number: HSS/0474/013M

Project title: The role of father's parental involvement in female reproductive strategies. The case of Botswana

Dear Ms Thutoemang,

Full Approval – Expedited

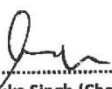
In response to your application dated 20 March 2013, the Humanities & Social Sciences Research Ethics Committee has considered the abovementioned application and the protocol have been granted **FULL APPROVAL**.

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number.

Please note: Research data should be securely stored in the discipline/department for a period of 5 years.

I take this opportunity of wishing you everything of the best with your study.

Yours faithfully


.....
Dr Shenuka Singh (Chair)

/ms

Cc Supervisor: Professor Lance Lachenicht
cc Academic Leader Research: Professor D Wassenaar
cc School Administrator: Mr Sbonelo Duma

Humanities & Social Sciences Research Ethics Committee

Dr Shenuka Singh (Chair)

Westville Campus, Govan Mbeki Building

Postal Address: Private Bag X54001, Durban 4000

Telephone: +27 (0) 31 260 3587/8350/4557 Facsimile: +27 (0) 31 260 4609 Email: ximbap@ukzn.ac.za / snymann@ukzn.ac.za / mohunp@ukzn.ac.za

Website: www.ukzn.ac.za



Founding Campuses: Edgewood Howard College Medical School Pietermaritzburg Westville

TELEPHONE: 363 2766
FAX: 391 0647
TELEGRAMS: RABONGAKA
TELEX: 2818 CARE BD



Republic of Botswana

MINISTRY OF HEALTH
PRIVATE BAG 0038
GABORONE

REFERENCE NO: PPME 13/18/1 PS V (249)

9 July 2013

Health Research and Development Division

Notification of IRB Review: New application

Tlotlo Cousy Thutoemang
P.O. Box 45838
Gaborone

Protocol Title: THE ROLE OF FATHER PARENTAL
INVOLVEMENT IN FEMALE REPRODUCTIVE
STRATEGIES: THE CASE OF BOTSWANA

HRU Approval Date: 8 July 2013
HRU Expiration Date: 7 July 2014
HRU Review Type: HRU reviewed
HRU Review Determination: Approved
Risk Determination: Minimal risk

Dear Sir/Madam

Thank you for submitting new application for the above referenced protocol. The permission is granted to conduct the study.

This permit does not however give you authority to collect data from the selected sites without prior approval from the management. Consent from the identified individuals should be obtained at all times.

The research should be conducted as outlined in the approved proposal. Any changes to the approved proposal must be submitted to the Health Research and Development Division in the Ministry of Health for consideration and approval.

Furthermore, you are requested to submit at least one hardcopy and an electronic copy of the report to the Health Research, Ministry of Health within 3 months of completion of the study. Approval is for academic fulfillment only. Copies should also be submitted to all other relevant authorities.

Continuing Review

In order to continue work on this study (including data analysis) beyond the expiry date, submit a Continuing Review Form for Approval at least three (3) months prior to the protocol's expiration date. The Continuing Review Form can be obtained from the Health Research Division Office (HRDD), Office No. 9A 11 or Ministry of Health website: www.moh.gov.bw or can be requested via e-mail from Mr. Kgomotso Motlhanka, e-mail address: kgmmotlhanka@gov.bw. As a courtesy, the HRDD will send you a reminder email about eight (8) weeks before the lapse date, but failure to receive it does not affect your responsibility to submit a timely Continuing Report form.

Amendments

During the approval period, if you propose any change to the protocol such as its funding source, recruiting materials, or consent documents, you must seek HRDC approval before implementing it. Please summarize the proposed change and the rationale for it in the amendment form available from the Health Research Division Office (HRDD), Office No. 7A 7 or Ministry of Health website: www.moh.gov.bw or can be requested via e-mail from Mr. Kgomotso Motlhanka, e-mail address: kgmotlhanka@gov.bw. In addition submit three copies of an updated version of your original protocol application showing all proposed changes in bold or "track changes".

Reporting

Other events which must be reported promptly in writing to the HRDC include:

- Suspension or termination of the protocol by you or the grantor
- Unexpected problems involving risk to subjects or others
- Adverse events, including unanticipated or anticipated but severe physical harm to subjects.

If you have any questions please do not hesitate to contact Mr. P. Khulumani at pkhulumani@gov.bw, Tel +267-3914467 or Lemphi Moremi at lamoremi@gov.bw or Tel: +267-3632754. Thank you for your cooperation and your commitment to the protection of human subjects in research.

Yours faithfully



P. Khulumani

For Permanent Secretary



Appendix 8



WOMEN'S ASSOCIATION

Private Bag 00470, Gaborone, Botswana.
Tel/Fax : (267) 3909335 E-mail: info@emangbasadi.org.bw

27th March, 2013
Kwazulu-Natal
School of Psychology
Private Bag X01 Scottsville
Pietermaritzburg, 3209
South Africa

Attention: Ms Tlotlo Thutoemang


Request for Counseling Assistance

This is to respond to your letter dated 15th March, 2013 in which you were requesting for counseling assistance to some of your participants who may get distressed as a result of responding to items in the questionnaire as it taps on past experience during the study that you intend to carry out

Emang Basadi pledges to assist with counseling assistance, should the need arise

Thank you

Regards


Ida Mokereitane (Ms)
Executive Director