



Original Article

Age and sexual assault during robberies

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Initial receipt 13 October 2010; final revision received 2 April 2011

Abstract

We use data from the National Incident-Based Reporting System to examine the effects of offender and victim age on whether male offenders commit sexual assault while robbing women. Restricting analyses to robberies reveals the offenders' age preferences since it allows one to control for the effects of opportunity. We find that robbers of all ages are most likely to sexually assault women at ages 15–29 years, ages when their reproductive potential is highest. However, in contrast to the idea that rape is a direct adaptation, victims are no more likely to be raped than sexually assaulted at these ages. The age of the offender is also a strong predictor of sexual assault. The likelihood that a robber commits a sexual assault increases from age 12 years until he reaches his early thirties when it begins to decline. This age pattern corresponds, to some extent, to age differences in the male sex drive.

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Keywords: Sexual assault; Rape; Robbery; Evolutionary psychology; National Incident-Based Reporting System; Victims; Age

1. Introduction

Research shows that victims of rape and sexual assault are overwhelmingly young (e.g., Lalumiere, Harris, Quinsey, & Rice, 2005; Thornhill & Thornhill, 1983). Thornhill and Palmer (2000) argue that males target young females because of their reproductive potential (see also, e.g., Ellis, 1989; Malamuth, Huppig, & Bryant, 2005; Symons, 1979). Their choice of young females reflects a reproductive strategy that was successful in ancestral history. However, evolutionary psychologists differ as to whether rape is a direct adaptation or a by-product of other adaptations. According to the direct adaptation hypothesis, rape itself was favored by selection because it increased male reproductive success (Thornhill & Palmer, 2000). Males who raped females increased their likelihood of producing more offspring. As a result, the tendency to rape and target women with the most reproductive potential was encoded in male genes. This adaptation leads them to rape women who are in their years of highest fecundity.

A less controversial argument is that rape and other sexual assaults are by-products of other male psychological

adaptations (Symons, 1979; see also Ellis, 1989; Shields & Shields, 1983; Thornhill & Palmer, 2000; Thornhill & Thornhill, 1983). According to the by-product hypothesis, sex differences in reproductive strategy resulted in a tendency toward promiscuity in males and a tendency toward selectivity in females. While males tend to be indiscriminant, they favor young women because they find them more sexually attractive. Thus, laboratory studies find that heterosexual men show the greatest sexual arousal in response to women between the ages of 18 and 25 years (see Langevin, 1983). Male attraction to young but sexually mature females reflects the association between age and female reproductive potential in ancestral history. From this perspective, male sexuality and standards of female sexual attractiveness are direct adaptations, and sexual assaults on young women are a by-product.

Age patterns, however, may reflect the effects of opportunity (e.g., Kimmel, 2003; Palmer 1991; Travis, 2003). Opportunity is a key factor affecting the risk of crime victimization generally (Felson, 1998). Young people have more contact with offenders because they go out at night more often (e.g., Warr, 1993). In addition, in the early teenage years, they may be more vulnerable because of physical weakness and inexperience. When they become older adults, their physical vulnerability is likely to increase. In this research, we attempt to control for these opportunity

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factors by examining the effects of a female's age on whether she is sexually assaulted during a robbery committed by a male. We also examine whether the robbery offender's age affects the likelihood that he engages in a sexual assault and whether his age affects his age preferences.

A previous study attempted to control for opportunity by examining whether men commit rape during the commission of a robbery (Felson and Krohn, 1990). They used the National Crime Survey (1980–82) to compare the ages of female victims in robbery with the ages of female victims in rapes committed in conjunction with robbery. They found that the mean age of victims of robbery/rape was 27.9, while the mean age of victims of pure robbery was 35.0 years. The 7 year difference was statistically significant. However, the results were based on a small sample (887 robberies), while our analyses is based on over 34,000 robberies. This allows us to examine in detail the age distribution of victims and offenders.

Other research has attempted to control for opportunity by examining whether men commit rape during the commission of a homicide. They found that female homicide victims who had been raped were younger than female homicide victims who had been the victim of theft (Shackelford, 2002; Wilson, Daly, & Scheib, 1997). Also relevant are two studies that compare the age of victims for different crimes. They find that female victims of rape tend to be younger than female victims of homicide, aggravated assault, and property crimes (Ennis, 1967; Thornhill & Thornhill, 1983).

Researchers have paid much less attention to the age of sexual assault offenders. Thornhill and Palmer (2000) suggest that age differences in offending should correspond with age differences in the male sex drive (see also Thornhill & Thornhill, 1992). Thornhill and Thornhill (1983) suggest that “men will be most likely to rape at ages prior to first marriage when competition for females is most intense (p. 148).” These ideas imply that the tendency to commit sexual assault should increase when males reach sexual maturity and that their rates should decline as they age. Young men, however, are more likely to commit crime generally. In fact, Thornhill and Thornhill found that the age distributions for rape, robbery and homicide offenders were similar. They explain the similarity by suggesting that all three crimes reflect sexual competition. Whether this is true or not, the method cannot be used to show that sexual assault is associated with the male sex drive or sexual competition. In addition, it is not clear that the method adequately controls for opportunity factors.

Another important issue is whether older and younger men have different age preferences. From Thornhill and Palmer's perspective, older men and younger men should both prefer young women since both respond to reproductive potential or sexual attractiveness. On the other hand, one may observe age homophily if men are more likely to have contact with women their own age or if older men are more likely than younger men to be attracted to older women.

2. Current study

We examine the ages of victims and offenders of robberies involving male offenders and female victims using data from the National Incident-Based Reporting System (NIBRS). We compare robberies that involve a sexual assault and those that do not in order to find out the age preference of sexual assault offenders. Because we are examining robberies, we know that actual contact between the potential sexual assault offender and victim has already been established. We are, to a considerable degree, equalizing opportunities for an offender to sexually assault victims of different ages. Thus, the comparison allows us to control for age-related opportunity factors.

We suspect that, in most instances, the robbery precedes the sexual assault, but whether it does or not should not affect our results. We also suspect that many robberies do not provide an opportunity for a sexual assault since a sexual assault, particularly when it involves rape, takes additional time. This characteristic should reduce the relationships between age and sexual assault. Thus, we view our analyses as providing a conservative test of hypotheses about age preferences.

We first present graphs showing the effects of the age of robbery victims and offenders on the likelihood of a sexual assault. We predict that robbery victims will be most likely to be sexually assaulted when they are at ages of greatest reproductive potential or fecundity. Fecundity refers to the capacity to produce offspring while fertility refers to the actual number of offspring produced. We emphasize fecundity because it is much less likely than fertility to be affected by cultural factors. Fecundity is at its highest level at ages 15–19 years and then begins a steady decline, with substantial declines not occurring until after age 30 years (Mosher & Pratt, 1985).

We recognize that there is an imperfect fit between these fecundity levels, sexual attractiveness, and the risk of sexual assault. First, determining the exact ages at which females became sexually mature in ancestral history is difficult to determine. The median age of menarche across human populations today ranges from about 12.0 to 18.5 years (Ellis, 2004), and there is a delay before ovulation begins. Second, females in modern societies have the means to make themselves appear more sexually attractive; girls can make themselves look older and older women can make themselves look younger. These efforts may alter the age-related risks. Finally, there may be other evolved characteristics that alter the ages of risk, at least in the case of rape. For example, Ellis, Widmayer and Palmer (2009) suggest that offenders target younger victims to secure long-term mates and that women may have evolved counterstrategies to avoid victimization at ages of fecundity. These complications make it difficult to make precise predictions about age-related risk.

We also predict that robbery offenders will be most likely to engage in sexual assault when they are at ages

with the strongest sex drive. Evidence suggests that libido is related to testosterone and that testosterone levels and libido decline with age (e.g., Booth, Johnson, & Granger, 1999; Dabbs & Morris, 1990; see Sternbach, 1998, for a review). If we use testosterone levels as a guide, we would expect that the tendency to commit sexual assault should increase dramatically from age 12 years to the early twenties and then begin a slow decline. In a third graph, we examine the effects of both age of offender and age of victim. We test the hypothesis that older offenders are more likely than younger offenders to sexually assault older victims. If age homophily is occurring then we should find that the victim's age should be more strongly related to sexual assault among younger offenders.

We then use logistic regression in an attempt to model the effects of age of offender and age of victim on the likelihood that a robbery also involved a sexual assault. These analyses allow us to test for statistical significance and to examine age effects controlling for location, race, weapon use, substance use and the victim's relationship to the offender.

Finally, we examine whether the results are different for rape and other sexual assaults. The direct adaptation hypothesis implies that victim's age should have a stronger effect on rape because it involves a reproductive act. To test the hypothesis, we select only those robberies that involve a sexual assault. We then examine whether the age of the victim predicts the likelihood that the offense involved a rape vs. a sexual assault not involving rape.

3. Methods

The current study uses incident-level data from the NIBRS Extract Files. National Incident-Based Reporting System is part of the Uniform Crime Reporting (UCR) Program, which is administered by the Federal Bureau of Investigation. Much like the UCR, NIBRS compiles data from local law enforcement agencies on details pertaining to offenses that come to the agency's attention. Crimes are included in NIBRS if they are reported and investigated by the reporting law enforcement agency. We preferred NIBRS to UCR because it has more information on each offense. The National Incident-Based Reporting System, however, does not cover the entire nation. The FBI has since updated their site, the sentence should now read as follows: As of 2007, 6,444 law enforcement agencies contributed to NIBRS, representing 25% of the U.S. population (http://www.fbi.gov/about-us/cjis/ucr/frequently-asked-questions/nibrs_faqs). (www.fbi.gov/ucr/faqs.htm).

In an effort to accumulate as many cases as possible, we pool 8 years of data (ranging from 2000 to 2007). We included all cases that involved a robbery committed by a lone male, age 12 years or older, against a lone female. Our analyses of victim ages are based on 44,825 robbery incidents.

Our outcome variable is whether the offender committed a sexual assault during the robbery. Sexual assault included cases that fall into the forcible sex offense category: forcible rape, forcible sodomy, sexual assault with an object and forcible fondling. Our primary predictor variables are the victim's age and the offender's age. In our logistic regression equations we also include measures of the offender's race, the victim's race, weapon use, substance use, location and whether the victim knew the offender. We code race of offender and victim as black–white, black–black, white–black, or white–white (reference category). Weapon use is a series of dummy variables coded as involving a gun, some other weapon or no weapon (the reference category). Substance use is a dichotomous variable coded 1 if the offender was suspected of using either drugs or alcohol during the offense and 0 otherwise. The location of the offense is treated as a series of dummy variables, coded as at a residence, in an isolated outdoor location or elsewhere (the reference category). We choose these locations because they seemed most likely to provide an opportunity for a sexual assault. Finally, offender–victim relationship is a dummy variable coded as either known or stranger.

Our logistic regression equations are based on 34,689 cases. Most of the cases we lose are due to missing data on the offender's age. To avoid losing more cases we include variables that represent missing data codes for weapon use, offender–victim relationship and offender–victim race. In the case of race, we treat other racial combinations as missing data. We obtain similar results when we omit these missing data variables and use list-wise deletion (analyses not presented).

4. Results

Descriptive statistics are presented in Table 1. Only 2% of robberies involved a sexual assault. The mean age for robbery victims was 37.5 years, while the mean age for robbery offenders was 28.1 years. The age categories we present in the table are the ones we will be using in our regression analyses. Victims younger than 10 years old, however, will be excluded because of the limited cell size. Note that the categories are unequal so one cannot compare frequencies across age categories.

Robberies frequently occurred in residences while they rarely occurred in isolated, outdoor locations. About 40% of offenders used a weapon (ignoring the missing data). Only 4.2% were suspected of using drugs or alcohol. Finally, robberies are most likely to involve black offenders and victims and least likely to involve a white offender and a black victim.

In Fig. 1, we show the effect of a robbery victim's age on her risk of sexual assault. The results show that the likelihood of sexual assault increases as victims reach sexual maturity

Table 1
Descriptive statistics

Variable	N	%
Offense type		
Robbery (pure)	43,930	98.00
Robbery/sexual assault	895	2.00
Offender's age		
12–15 years	943	2.63
16–19 years	5154	14.4
20–24 years	9145	25.55
25–29 years	6700	18.72
30–34 years	4990	13.94
35–54 years	8526	23.82
55–98 years	331	0.92
Victim's age		
10–14 years	395	0.89
15–19 years	3926	8.87
20–29 years	13,189	29.81
30–49 years	17,258	39.01
50–98 years	9472	21.41
Location		
Residence	10,484	23.39
Isolated outdoors	281	0.63
Elsewhere	34,060	75.98
Weapon use		
Gun	11,726	26.16
Other weapon	5239	11.69
No weapon	25,756	57.46
Unknown/missing	2104	4.69
Offender substance use		
Using	42,939	95.79
Not using	1886	4.21
Offender–victim relationship		
Known	10,920	24.36
Stranger	20,802	46.41
Unknown/missing	13,103	29.23
Offender–victim race		
White–white	9925	22.57
White–black	885	2.01
Black–white	14,757	33.56
Black–black	16,132	36.69
Other/missing	2275	5.17
Total	44,825	

and it begins to decline in their late twenties. The decline is steady until the late forties, when it drops precipitously. The highest risks are observed at ages 15–29 years.

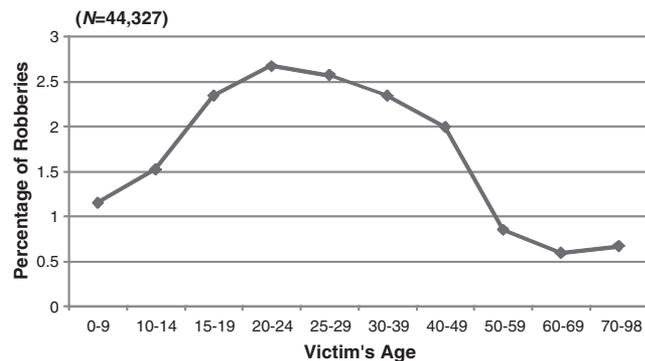


Fig. 1. Victim age and risk of sexual assault during robbery.

In Fig. 2, we present the effect of a robbery offender's age on his likelihood of committing a sexual assault. The results show that the likelihood of sexual assault increases as offenders reach sexual maturity and it begins to decline in the late thirties.

In Fig. 3, we examine whether older men are as likely as young men to prefer young women. The figure shows the effect of a victim's age on her risk of sexual assault for robberies committed by youth (younger than 18 years), young adults (18–29 years) and older adults (30 years and older). For each of these offender age groups, we compute the percentage of sexual assaults that occurred at different victim ages. Converting to percentages facilitates comparison since different offender age groups have different rates of sexual assault (Table 2). The results show that the curves for older and younger adults are fairly similar. Thus, older adults have as strong a preference for young victims as do younger adults. The curve for youth differs slightly due to a tendency for youth to be more likely than adults to sexually assault youth.

In Table 2, we estimate the effects of age of victim and offender on sexual assault during a robbery using logistic regression. We treat the age variables as dummy variables basing our categories on the patterns observed in the figures. For victim age, we used the oldest age category (50+ years) as the reference category while for offender age, we used the youngest age category (12–15 years).

The results show that the patterns observed in Figs. 1 and 2 are observed with controls. Robbery victims' age 10–14 years are at a lower risk of sexual assault than victims at ages 15–29 years. The risk declines when victims reach their thirties and forties, with the largest decline occurring in the late forties. For example, the odds of a sexual assault is almost five times higher if the victim is 16–19 years than if she is 50 years or older. We also confirm the effects of the age of the offender. The likelihood of sexual assault increases until men reach age 30–34 years and then begins to decline. The results show, for example, that the odds that a sexual assault occurs during a robbery are 15.5 times higher if the offender is 30–34 years old than if he is 12–15 years old.

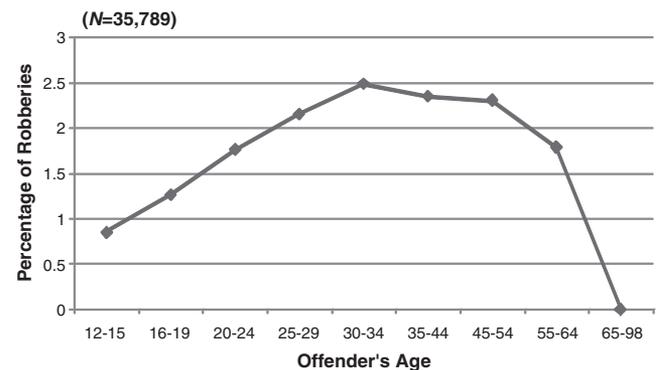


Fig. 2. Offender age and risk of sexual assault during robbery.

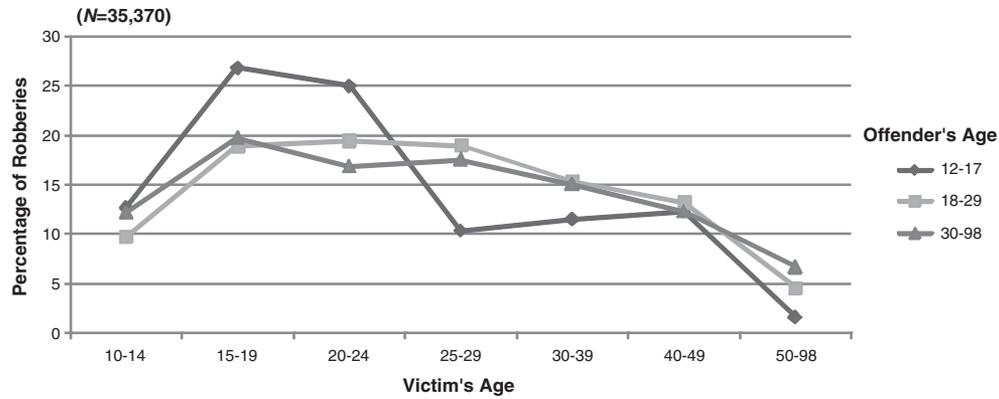


Fig. 3. Percentage of robberies that involve sexual assault for victims and offenders of different ages.

We also see some effects of the control variables. Sexual assaults are more likely when the offender is a stranger, when the offender is suspected of substance use and when the

Table 2
Logistic regression predicting sexual assault during robbery (N=34,689)^a

Variable	b	S.E.	OR
Victim's age			
10-14 years	1.02	0.53	2.77
15-19 years	1.55***	0.18	4.71
20-29 years	1.36***	0.15	3.91
30-49 years	1.07***	0.15	2.90
50-98 years (reference)	-	-	-
Offender's age			
16-19 years	0.38	0.40	1.47
20-24 years	0.74	0.39	2.10
25-29 years	0.92*	0.40	2.51
30-34 years	1.11**	0.40	3.03
35-54 years	1.04**	0.39	2.85
55-98 years	0.83	0.60	2.30
12-15 years (reference)	-	-	-
Offender-victim race			
White-black	-0.06	0.30	0.94
Black-white	0.31**	0.11	1.36
Black-black	0.06	0.11	1.06
White-white (reference)	-	-	-
Location of offense			
Residence	0.91***	0.09	2.48
Isolated outdoors	2.79***	0.18	16.21
Elsewhere (reference)	-	-	-
Weapon use			
Gun	-0.56***	0.11	0.57
Other weapon	0.16	0.11	1.17
No weapon (reference)	-	-	-
Offender-victim relationship			
Known	-0.81***	0.11	0.44
Stranger (reference)	-	-	-
Offender substance use	1.01***	0.12	2.75
Constant	-5.99***		

* p<.05.
** p<.01.
*** p<.001.

^a Logistic regression equation included missing data variables for the following variables: offender-victim race, weapon use and offender-victim relationship.

robbery occurs in a residence or in an isolated outdoor location. Isolated outdoor locations pose the greatest risk. Robberies involving a black offender and a white victim are slightly more likely than a white-on-white offense to involve a sexual assault. Note that South and Felson (1990) did not find significant effects of racial composition in their analysis of race and sexual assault during robbery using National Crime Victimization Survey data.

Finally, we tested the hypothesis that victim's age has a stronger effect on rape than on other sexual assaults (see Table 3). We estimated a logistic regression equation

Table 3
Logistic regression predicting rape versus other sexual assault during a robbery/sexual assault (N=694)^a

Variable	B	S.E.	OR
Victim's age			
0-14 years	-0.46	1.18	0.63
15-29 years	-0.73**	0.24	0.48
30-98 years (reference)	-	-	-
Offender's age			
0.00	0.01	1.00	
Offender-victim race			
White-black	0.13	0.83	1.14
Black-white	0.53	0.28	1.70
Black-black	0.77**	0.30	2.16
White-white (reference)	-	-	-
Location of offense			
Residence	0.09	0.24	1.10
Isolated outdoors	1.31	0.75	3.70
Elsewhere (reference)	-	-	-
Weapon use			
Gun	0.61	0.35	1.84
Other weapon	0.49	0.34	1.63
No weapon (reference)	-	-	-
Offender-victim relationship			
Known	0.18	0.29	1.19
Stranger (reference)	-	-	-
Offender substance use	0.13	0.37	1.13
Constant			1.41**

** p<.01.

^a Logistic regression equation included missing data variables for the following variables: offender-victim race, weapon use and offender-victim relationship.

where we examined the effects of victim age on whether victims of sexual assault/robbery were at greater risk of rape than other sexual assault. We treated age as a three-category variable coded as underage 15 years; 15–29 years, and older than 30 years (reference category). The prediction is that victims in their years of greatest fecundity (15–29 years) are most likely to be raped, so this coefficient should be positive. The results do not support the direct-adaptation hypothesis. The coefficient for the ages 15–29 years has a negative sign: sexual assault victims in their years of greatest fecundity (15–29 years) were significantly less likely to be raped than older victims. In addition, victims 15–29 years are slightly less likely to be raped than victims younger than 15 years.

5. Discussion

Our results provide strong evidence that offenders have a preference for young, sexually mature women. The risk of sexual assault for female robbery victims increases as they reach sexual maturity and begins to decline in the late twenties. Thus, female robbery victims are most likely to be sexually assaulted when they are between the ages of 15 and 29 years. This pattern is fairly consistent with fecundity levels, which peak at ages 15–19 years and begin a substantial decline at age 30 years. Our evidence is therefore consistent with the idea that risk of sexual assault is highly related to age-related sexual attractiveness.

Support for our hypothesis regarding the age of offender was more mixed. On the one hand, we did find a curvilinear relationship between age and offending that is consistent with age variation in the male sex drive. Sexual assault increases from age 12 to 20 years, ages that mirror increases in testosterone levels. In addition, both testosterone levels and the likelihood of sexual assault decline in older adult years. However, testosterone levels peak in the early twenties while sexual assaults peak in the early thirties. In other words, the incidence of sexual assault continues to increase when testosterone levels are decreasing. Our tentative conclusion is that the ages at which males engage in sexual assault generally reflect ages in which the male sex drive is strongest. The conclusion is tentative since we have no measure of testosterone for individual offenders and since the strength of the relationship between male sex drive and testosterone levels is unknown. In addition, it is difficult to know how much precision in age predictions is required.

The fact that older men are just as likely to sexually assault young women as are younger men is interesting. The only homophily we observe is for teenage offenders: They are more likely than adults to target youth. We did not observe either homophily or a male preference for slightly younger women among adult men. These are the patterns one observes in consensual sex, where age patterns reflect the preferences of both parties. Perhaps the preference that

older men have for young women helps explain why offenders in their thirties, forties and fifties, have higher rates of sexual assault than expected, given declines in their sex drive. If older men are attracted to young people but attraction is rarely reciprocated, then most older men only have sexual access to the young if they pay for it or use force. The interest of older men in young women may increase their tendency to engage in sexual assault.

We also tested the direct adaptation hypothesis that men are more likely to rape than engage in other forms of sexual assault when women are at the height of their reproductive potential. We found no support for this hypothesis. In fact, the effects were in the opposite direction. Victims at the height of their reproductive potential (ages 15–29 years) were less likely, not more likely, to be raped than older or younger victims. This evidence is more consistent with the by-product hypothesis. Sex differences in sexuality as well as sex differences in violence play an important role in explaining why men commit sexual assault. Men sexually assault young women because of the association between sexual attractiveness and age.

An alternative interpretation is that men are more likely to sexually assault young women because, for some reason, they have a greater desire to harm them or dominate them. However, analyses not presented show that robbers are not particularly likely to physically injure victims at these ages. It is difficult to imagine a characteristic of young women, other than their sexual attractiveness, that would increase their risk of sexual assault during a robbery but not their risk of physical injury.

In summary, our results are generally consistent with predictions from evolutionary psychology. They suggest that the age of the offender and victim are strong predictors of whether a sexual assault occurs during a robbery involving a male offender and a female victim. Sexual assault is most likely when the men are at ages when their sex drive is strongest and women are at ages when they are most sexually attractive. Men of all ages usually target young but sexually mature females.

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