



signed to motivate rape of reproductive-aged females [see Thornhill and Palmer, 2000; Thornhill and Thornhill, 1983, 1992].

Extending this evolutionary psychological logic, Wilson et al. [1997] hypothesized that younger, reproductive-aged females are overrepresented among the victims of rape-murder. Wilson et al. [1997] documented support for this hypothesis using two national-level homicide databases (Canada and England/Wales) and one city-level homicide database (Chicago). Across all three databases, reproductive-aged women incurred excess risk of rape-murder relative to nonreproductive-aged women.

Younger women may be at excess risk for rape-murder not because of their relatively greater reproductive value (expected future reproduction) [Trivers, 1972] or fertility (current likelihood of conception), as hypothesized by an evolutionary psychological perspective. Instead, according to a "routine activities" perspective [e.g., Mustaine, 1997; Mustaine and Tewksbury, 1999; Ploughman and Stensrud, 1986], younger, reproductive-aged women may incur excess risk of rape-murder because they spend more time around younger men. Younger men, in turn, compose the demographic group that commits the majority of crimes, including rape, murder, and rape-murder [Daly and Wilson, 1988; Thornhill and Palmer, 2000; Wilson et al., 1997].

Wilson et al. [1997] pitted their evolutionary psychological hypothesis of the excess risk of rape-murder incurred by reproductive-aged women against a hypothesis derived from a routine-activities perspective. Wilson et al. [1997] compared the age-dependent risk of rape-murder for females against the age-dependent risk of theft-murder for females. The majority of both types of homicide are committed by young men not previously known to the murdered female [Daly and Wilson, 1988; Wilson et al., 1997]. According to a routine-activities perspective, younger women should incur excess risk of theft-murder for the same reason that they incur excess risk of rape-murder; that is, they more frequently associate with younger men, the primary perpetrators of both crimes. According to an evolutionary psychological perspective, in contrast, there is no reason to expect that younger women will be overrepresented among the victims of theft-murder. To the contrary, because of their lesser strength, for example, older women may be specifically targeted by young men motivated by an interest in stealing valuable goods with minimal cost or risk of injury [Wilson et al, 1997].

Across all three homicide databases, Wilson et al. [1997] documented a very different age-dependent risk pattern for theft-murder relative to the risk pattern for rape-murder. Contrary to the hypothesis derived from a routine-activities perspective, younger women were underrepresented as victims of theft-murder. The greatest risk of theft-murder instead occurred for women older than 65 years. Wilson et al. [1997] concluded that younger women incur excess risk of rape-murder and that this excess risk cannot be attributed solely to the more frequent association of younger women with young men—the demographic group responsible for the majority of crimes, including rape, theft, murder, rape-murder, and theft-murder.

The present study attempted to replicate the findings of Wilson et al. [1997] using the largest national-level homicide database available—the United States Federal Bureau of Investigation's Supplementary Homicide Reports for the years 1976 through 1994. This database provides incident-level information on more than 429,000 homicides. Among the variables coded for each homicide are the victim's age and sex, the offender's age and sex, the relationship of the victim to the offender (e.g., stranger), and the circumstance of the murder (e.g., rape, theft). Using this unparalleled national-level database, I tested the hypothesis that reproductive-aged women incur excess risk of rape-murder that is not solely attributable to younger women's more frequent association with younger, more violent men. To test this hypothesis, I compared the age-dependent rates of male-perpetrated rape-murder of females with the age-dependent rates of male-

perpetrated theft-murder of females. If the evolutionary psychological hypothesis is correct, young, reproductive-aged women would be overrepresented among the victims of rape-murder but would not be overrepresented among the victims of theft-murder. If the routine-activities hypothesis is correct, young women would be overrepresented among the victims of both rape-murder and theft-murder.

## **METHOD**

### **Database**

The United States Federal Bureau of Investigation (FBI) requests information from each state on criminal homicides. Supplementary Homicide Reports (SHRs) include incident-level data on every reported homicide, including the relationship of the victim to the offender, the victim's age and sex, the offender's age and sex, and the circumstance of the homicide. The database analyzed for the present research includes SHRs for the years 1976 through 1994 [Fox, 1996], providing information on 429,729 homicides.

### **Procedures**

According to the FBI [1999, p 405], "forcible rape" against a female is defined as "The carnal knowledge of a female forcibly and against her will." Criminal homicide, in turn, is defined as "the willful (nonnegligent) killing of one human being by another" [FBI, 1999, p 405]. Rape-murder of a female, therefore, occurs when a female murder victim has been raped just before, during, or just after she has been killed. The FBI consistently used this definition of rape-murder in coding cases for the SHRs analyzed in the present research. Cases were coded as rapes (rather than instances of consensual sex) according to information provided by local authorities to the FBI following criminal and forensic investigation of the homicide [FBI, 1999].

Of the homicides recorded in the database, 564 were cases in which a female was raped by a male previously unknown to her. The average age of rape-murder victims was 36.9 years ( $SD = 23.8$  years), ranging from younger than 1 year to 97 years. The average age of rape-murder perpetrators was 26.4 years ( $SD = 7.4$  years), ranging from 14 to 66 years. There were 1289 homicide cases in which a female was the victim of robbery ( $n = 950$ ), burglary ( $n = 307$ ), larceny ( $n = 9$ ), or motor vehicle theft ( $n = 23$ ). For all of these theft-murder cases, the perpetrator was a male previously unknown to her. The average age of theft-murder victims was 51.3 years ( $SD = 22.7$  years), ranging from younger than 1 year to 98 years. The average age of theft-murder perpetrators was 24.7 years ( $SD = 7.9$  years), ranging from 13 to 98 years. I calculated age-dependent rates of rape-murder and theft-murder according to relevant population estimates provided by the United States Census (available from the author on request).

## **RESULTS**

For the years 1976 through 1994, the FBI SHR database included 564 rape-murders and 1289 theft-murders committed by a male previously unknown to the female victim. I first calculated the rate of rape-murders per million females per annum as a function of the age of the female victim. For this and the remaining age variables, the age groupings are presented in 5-year intervals, following Wilson et al. [1997]. Figure 1 shows that younger, reproductive-aged women are overrepresented among the victims of rape-murder. Among women younger than 75 years, the risk of rape-murder peaks in the group aged 20 to 24 years and then generally decreases thereafter. The risk of rape-murder for women aged 20 to 24 years, for example, is about five

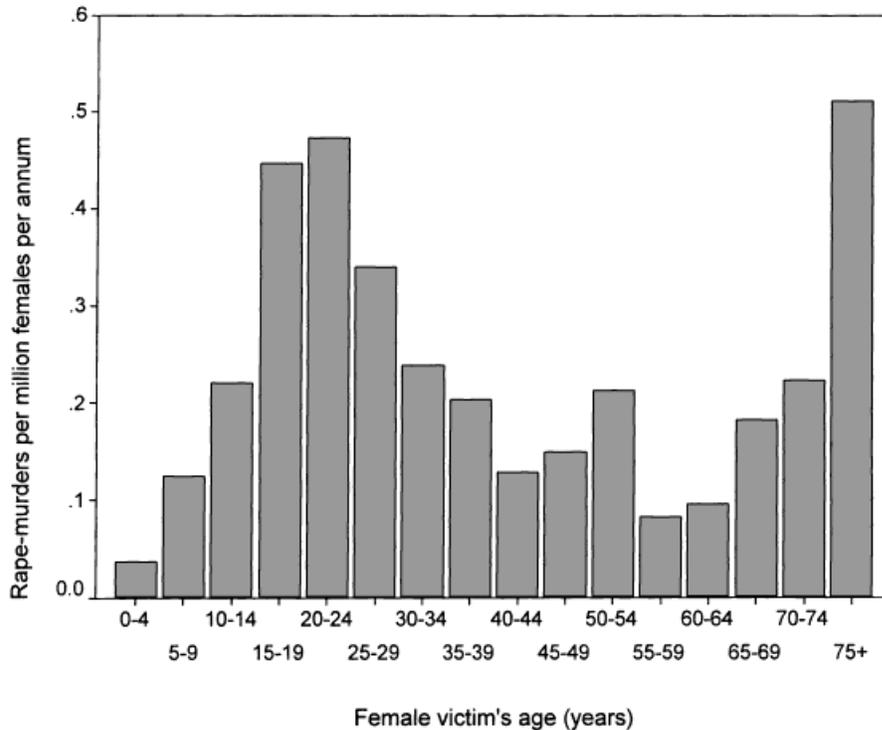


Fig. 1. Rape-murders per million females per annum as a function of female victim's age.

times greater than the risk of rape-murder for females aged 5 to 9 years and for females aged 55 to 59 years. Although the risk of rape-murder increases up to the age group 20 to 24 years and then generally decreases thereafter, there is a sudden and striking increase in the rape-murder rate for women older than 75 years. Women in this oldest age group are just as likely to be raped and murdered as are women aged 20 to 24 years.

Figure 2 displays the rape-murder perpetration rate as a function of the age of the male perpetrator. Young men are clearly overrepresented among the perpetrators of rape-murder. The rate of rape-murder perpetration for men aged 20 to 24 years, for example, is about nine times greater than the rate of rape-murder perpetration for boys aged 10 to 14 years and for men aged 45 years and older.

Figure 3 displays the theft-murder perpetration rate as a function of the age of the female victim. In stark contrast to the risk pattern shown in Fig. 1 for rape-murder, the rate of theft-murder increases with the age of the female victim. Younger, reproductive-aged women incur substantially less risk of theft-murder than do older, postreproductive-aged women. The rate of theft-murder victimization for women aged 20 to 24 years, for example, is about three times less than the rate of theft-murder victimization for women 75 years and older.

Figure 4 displays the theft-murder perpetration rate as a function of the age of the male perpetrator. This pattern of perpetration rates is nearly identical to that shown for male perpetration of rape-murder. Young men are overrepresented among the perpetrators of theft-murder. The rate of theft-murder perpetration for men aged 20 to 24 years, for example, is about 20 times greater than the rate of theft-murder perpetration for boys aged 10 to 14 years and for men aged 45 years and older.

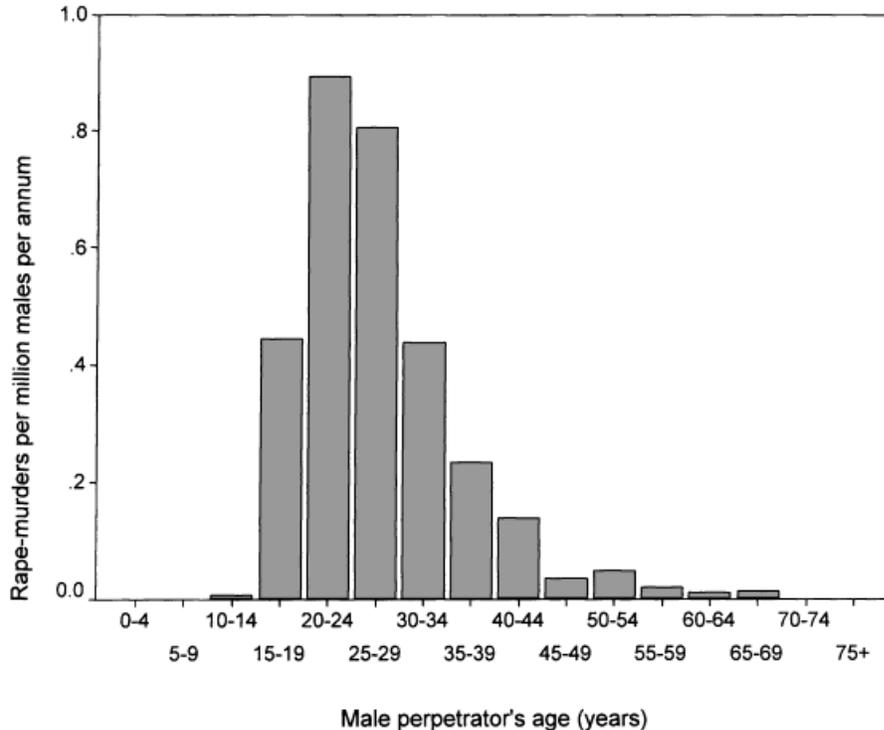


Fig. 2. Rape-murders per million males per annum as a function of male perpetrator's age.

## DISCUSSION

Using the largest available national-level database of homicides, I tested and found support for the evolutionary psychological hypothesis that young, reproductive-aged women are over-represented among the victims of rape-murder and that this overrepresentation is not solely attributable to the greater association of young women with young men—the demographic group responsible for perpetrating the majority of rape-murders. Following Wilson et al. [1997], I documented that young, reproductive-aged women incur excess risk of rape-murder. I also documented that young, reproductive-aged women are underrepresented among victims of theft-murder. Also following Wilson et al. [1997], I documented that the same demographic group is responsible for the majority of rape-murders and theft-murders, namely, young men.

Taken together, these results falsify the hypothesis derived from a routine-activities perspective, which states that reproductive-aged women are overrepresented among victims of rape-murder because they happen to be the demographic group that most frequently associates with young men. If that hypothesis were correct, then young, reproductive-aged women should have been overrepresented among the victims of theft-murder just as they are for rape-murder because the majority of both crimes are perpetrated by the same demographic group—young men. Instead, young women were grossly underrepresented among the victims of theft-murder.

The results of the present study replicate the findings of Wilson et al. [1997] with a larger national-level homicide database. This set of findings now has been replicated in three national-level homicide databases (United States, Canada, and England/Wales) and one city-level homicide database (Chicago). The pattern of findings reported in the present study and by Wilson et

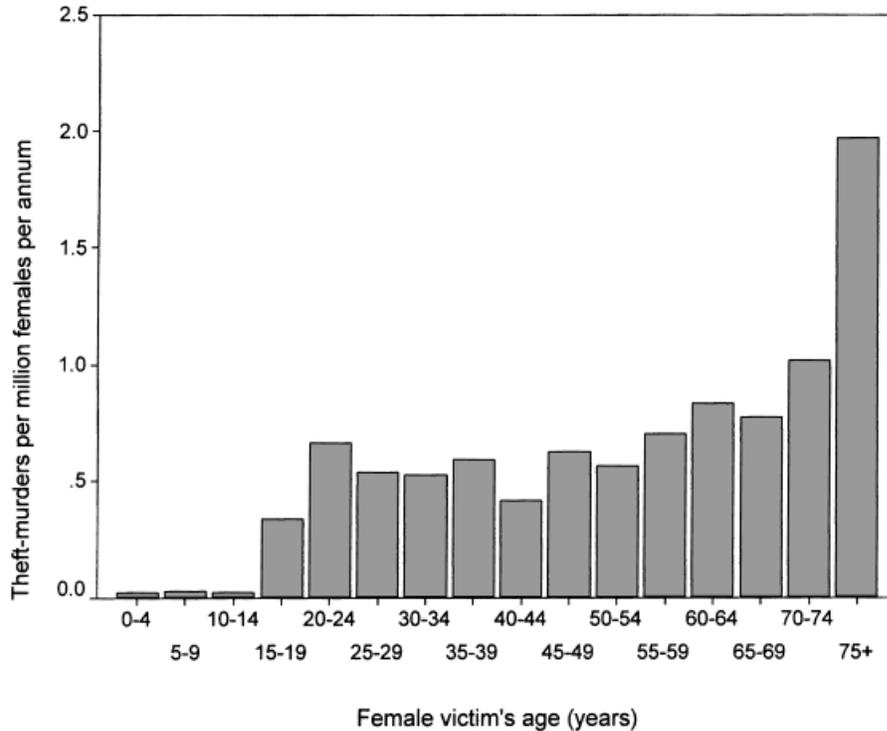


Fig. 3. Theft-murders per million females per annum as a function of female victim's age.

al. [1997], therefore, cannot be attributed to sample quirks, unless one wishes to argue that each of the samples share the same set of quirks, all of which coalesce to produce remarkably similar victimization and perpetration patterns for rape-murder and theft-murder.

Nonreproductive-aged females are raped, although the rates are lower than for reproductive-aged females [Thornhill and Thornhill, 1983]. The present research replicates this pattern for rapes that end in murder [see also Wilson et al., 1997]. Rape of nonreproductive-aged females challenges a simple evolutionary hypothesis that proposes that rape is one strategy for genetic propagation. Previous research informed by an evolutionary perspective has not addressed why nonreproductive-aged females are ever raped. Perhaps nonreproductive-aged females who are raped display cues falsely signaling that they are of reproductive age. Prereproductive-aged females who are raped, for example, might appear to be well developed sexually, displaying cues to fertility such as relatively wide hips [see Symons, 1995, for a review of research on the indicators of female fertility]. Or perhaps men who rape nonreproductive-aged females have differently functioning, evolved psychological mechanisms than do men who rape reproductive-aged females. Finally, although a man might prefer to rape a young, reproductive-aged woman, this class of females may not be accessible or available to him. For some rapists, prereproductive- and postreproductive-aged females may be targeted by default, such as when reproductive-aged females are less prevalent in the local environment.

Particularly striking in the present research is the sudden increase in the risk of rape-murder for women 75 years and older. Postreproductive-aged females who are raped might display cues

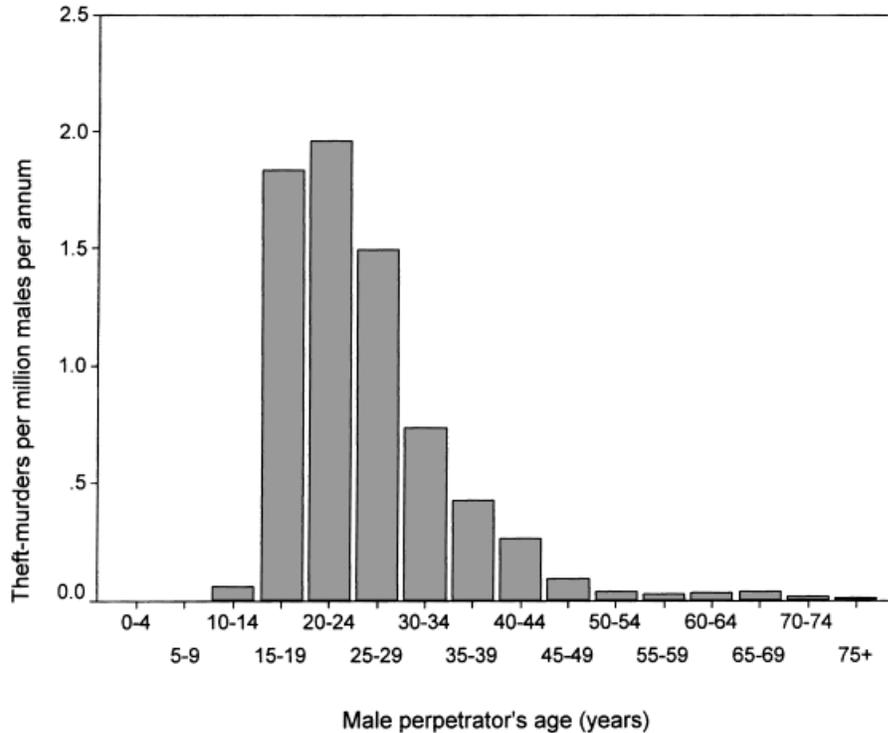


Fig. 4. Theft-murders per million males per annum as a function of male perpetrator's age.

to fertility such as relatively smooth skin and full lips [Symons, 1995]. But this speculation cannot account for the sudden increase in the risk of rape-murder evident only for those women 75 years and older. Furthermore, this sudden increase is not evident in the findings of Wilson et al. [1997], using samples from Canada, England/Wales, and Chicago. Because this sudden increase in the risk of rape-murder for women 75 years and older is not evident in the Chicago database analyzed by Wilson et al. [1997], one cannot easily argue that this sudden increase in the United States FBI SHR database reveals cultural differences in the occurrence or reporting of rape-murder among the oldest women. Perhaps there do exist cultural differences in the occurrence or reporting of rape-murder among the oldest group of women, but these differences are not evident in the much smaller sample of Chicago homicides analyzed by Wilson et al. [1997]. These speculations cannot be tested with the current homicide databases [including the databases analyzed by Wilson et al., 1997]. If the oldest women in the United States do indeed incur a sudden and striking increase in the risk of rape-murder, it is imperative that future research attempt to identify the causes of this increased risk, particularly given the backdrop of a rapidly aging United States population.

In the present sample of theft-murders and in the samples analyzed by Wilson et al. [1997], a female's risk of theft-murder increases with age. Older women are substantially overrepresented among the victims of theft-murder. What might account for this replicable finding? Perhaps older women have more of the resources and material goods that young men want. Citing national-level data from Canada and the United States, Wilson et al. [1997] note that older women

are not wealthier than younger women. Wilson et al. [1997] also note that older women are not likely to be at greater risk for theft-murder by virtue of their routine activities. Wilson et al. [1997] note that the well-documented fear of victimization reported by older women is likely to motivate these women to avoid risky situations, such as visiting places where young men congregate. Wilson et al. [1997, p 455] offer that the most likely explanation for the greater risk of theft-murder incurred by older women is that they “are a relatively vulnerable group, both in the sense of literal fragility, and in that they are perceived by offenders as defenseless and hence low-risk targets.” Wilson et al. [1997, p 455] note that their relative fragility and greater attractiveness as low-risk victims would make older women “maximally vulnerable to sexual assaults, too, if the perpetrators of this crime were indiscriminate with respect to their victims’ ages.”

An important question that cannot be addressed by analyses of the current database is why rape ever ends in murder. On a simple evolutionary account, it does not make sense for a man to rape a woman and then murder her. If he has impregnated her, she will not bear his offspring. Perhaps murders that are accompanied by rape are less likely to be intentional than murders that are not accompanied by rape. Or perhaps the male intentionally murdered his rape victim, having determined that the potential costs of detection outweighed the potential reproductive benefits of an additional offspring. Finally, men who commit rape-murder may be aberrant in many other ways, such that this particular crime requires no special explanation. Men who commit rape-murder, for example, may have particularly poor impulse control and other psychopathic tendencies. According to this account, abnormal men display abnormal behaviors, such as committing rape-murder. The FBI SHR database and the databases analyzed by Wilson et al. [1997] do not provide the data necessary for testing these speculations about why a rape ends in murder.

The present research was designed to replicate using rape-murders the age-dependent risk patterns reported by Thornhill and Thornhill [1983] for rape of females not accompanied by murder. According to Thornhill and Thornhill [1983], young females are at special risk of rape precisely because they are capable of bearing offspring. A reviewer of this article commented that the attempt to extend the Thornhills’ explanation of rapes to rape-murders is problematic because it is unknown whether and to what extent the sequelae of rape are generalizable to that of rape-murder. For example, it is not known whether perpetrators of rape-murders share with perpetrators of rapes not accompanied by murder a particular psychological state or suite of motivational characteristics. The results of the present work suggest some parallel between the two crimes insofar as the age-dependent risk patterns associated with these crimes are similar. Clearly, however, future empirical work is needed to assess the comparability of rapes and rape-murders along the lines of, for example, perpetrator motivation and psychological state.

As with other research investigating deviant behaviors, the results of the present research should not haphazardly be used to infer something about normal psychology and behavior. That some men commit rape-murders and that their victims tend to be young, reproductive-aged women does not imply that all normally functioning men are interested in committing rape-murder, especially against young women. The question is how to generalize the results of research using deviant samples to normal populations. This question has long plagued abnormal and clinical psychology [see, e.g., Davison and Neale, 1990], and I do not intend to answer it here, in the context of rape-murder. Nevertheless, the reader is cautioned that research using deviant samples may not clearly illuminate normal psychology and behavior.

In summary, the current research uses the largest available national-level homicide database to document that reproductive-aged females are overrepresented among the victims of rape-murder and that this overrepresentation cannot be attributed solely to the greater association of

young women with young men—the demographic group responsible for committing the majority of these crimes. These findings replicate the work of Wilson et al. [1997], who tested this hypothesis using two smaller national-level databases and a city-level database. Although consistent with an evolutionary perspective and contrary to a routine-activities perspective, the current results raise questions that challenge a simple evolutionary interpretation. These questions cannot be addressed by analyses of the current data but demand attention by researchers if we hope to reduce the risk of rape and rape-murder for all females.

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