

This article focuses on rape prevalence research and examines the relationship between measurement methods and level of rape detection. After a brief overview of empirical data, the relative threat to the validity of prevalence estimates posed by fabrication versus nondisclosure is weighed. Then various methodological choices and their relationship to the magnitude of prevalence estimates are examined. Addressed are the definitions underlying the studies, the questions used to elicit reports of rape, the context in which rape questioning occurred, the confidentiality of the responses, the method of data collection, and the sample integrity. The conclusions include 10 recommendations for the design of future studies of rape prevalence.

Detecting the Scope of Rape

A Review of Prevalence Research Methods

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"What was the defendant wearing?" That was Mr. Freeman's lawyer.

"I don't know."

"You mean to say this man raped you and you don't know what he was wearing?" He snickered as if I had raped Mr. Freeman.

"Do you know if you were raped?"

—Maya Angelou, *I Know Why the Caged Bird Sings* (1969)

Rape prevalence estimates attempt to document the percentage of women whose lives have been touched and changed by sexual violence. Therefore, they are a vehicle to challenge the illusion that rape is an infrequent crime. But the delineation of the full scope of rape faces many obstacles. This article is a review of rape prevalence estimates and an examination of several methodological features that may have influenced the level of rape that was identified. The literature included in the article are empirical studies of rape or sexual assault prevalence among adolescents and adults including both female and male victims. A review of rape incidence is available elsewhere (Koss, 1992). Excluded from the present review were studies of non-U.S. samples, which were omitted because there are sufficient difficulties reconciling the results in this literature without introducing cultural differences as well (e.g., Brickman & Briere, 1984; Herold, Mantle, & Zemitis, 1979; Zverina, Lachman, Pondelickova, & Vanek, 1987). Also excluded were studies that employed nonprobability samples because it is difficult to evaluate the generalizability of these findings. Most of the studies in this

latter group focused on college students (e.g., Belcastro, 1982; Eskridge, 1989; Kanin & Parcell, 1977; Kiernan & Taylor, 1990; Kirkpatrick & Kanin, 1957; McDermott, Sarvela, & Banracharya, 1988; Sigelman, Berry, & Wiles, 1984; Yegidis, 1986); but some involved community groups or specialized samples of patients (e.g., Brand & Kidd, 1986; Carmen, Rieker, & Mills, 1984; Davidson & Smith, 1990; Divasto et al., 1984; Hanneke, Shields, & McCall, 1986; Herman, 1986).

Definition of Terms

The traditional offense of *common law rape* is defined as "carnal knowledge of a female forcibly and against her will" (Bienen, 1981, p. 174). Carnal knowledge means penile-vaginal penetration. Traditionally included in the crime of rape are attempts to rape that stopped before any penetration took place. Excluded by this definition are sexual offenses other than penile-vaginal penetration, intercourse with girls below the statutory age of consent, rapes where the offender was the legal or common-law spouse of the victim, nonforcible rapes of victims unable to consent by virtue of mental illness, mental retardation, or drugs, and rapes of men.

In recent years reform rape laws have been passed by many states and by the federal government (Searles & Berger, 1987). *Reform statutes rape* typically is defined as nonconsensual sexual penetration of an adolescent or adult obtained by physical force, by threat of bodily harm, or when the victim is incapable of giving consent (Searles & Berger, 1987). *Sexual penetration* means "sexual intercourse, cunnilingus, fellatio, anal intercourse, or any other intrusion, however slight, of any part of a person's body, but emission of semen is not required" (Michigan Stat. Ann., 1980). Reform statutes are written in sex neutral language to allow application of the laws to male rape victims. To place greater emphasis on the behavior of the offender, reformed laws have replaced the word "rape" with other terms such as "sexual assault," "sexual battery," or "criminal sexual conduct." To signify the outrage of this crime, I have retained the traditional word "rape" to refer to the most highly sanctioned penetration offense. Forcible rape of adult women continues to be separated from statutory rape, which is sexual intercourse with children too young to give consent including both forcible and nonforcible incidents (Bienen, 1981). The most usual age of consent is 16 years although it may fall as low as 10 years or rise as high as 18 years (Searles & Berger, 1987).

The term *prevalence* is borrowed from the field of epidemiology where it has a precise meaning in relation to physical disease. As the techniques of epidemiology have been applied more broadly, the meaning of the term has

evolved to include mental health and crime phenomena. Prevalence refers to the number of active cases present during a defined period of time (Kleinbaum, Kupper, & Morgenstern, 1982). Many researchers have asserted that rape's impact remains active for a considerable time, if not indefinitely. Thus they have presented prevalence rates that consider as active cases anyone who has been raped during a lengthy period, sometimes including the entire lifespan.

EMPIRICAL DATA ON RAPE PREVALENCE

The studies of rape prevalence that met the inclusion criteria identified earlier are found in Table 1. Included in this group are studies that have focused on adolescents (Ageton, 1983a, 1983b; Hall & Flannery, 1984; Moore, Nord, & Peterson, 1989); college women (Koss, Gidycz, & Wisniewski, 1987; Koss & Oros, 1982; Miller & Marshall, 1987); adult women (Burt, 1979; Essock-Vitale & McGuire, 1985; Kilpatrick et al., 1985; Kilpatrick, Saunders, Veronen, Best, & Von, 1987; National Victims Center, 1992; Sorenson, Stein, Siegel, Golding, & Burnam, 1987; Winfield, George, Swartz, & Blazer, 1990; Wyatt, 1992); men and adolescent boys (George & Winfield-Laird, 1986; Moore et al., 1989; Sorenson et al., 1987); special populations including the homeless, elderly, nursing home residents, psychiatric patients, medical patients, lesbians, and prisoners (Berrill, 1990; George & Winfield-Laird, 1986; Goodman, 1991; Jacobson & Richardson, 1987; Koss, Woodruff, & Koss, 1991); and ethnic groups including Hispanics (Sorenson & Siegel, 1992; Sorenson et al., 1987) and African-Americans (Wyatt, 1992). The prevalence rates for sexual assault or rape as reported in each of these studies are summarized in Table 1 along with several major methodological characteristics of each project. To simplify the presentation, Table 1 contains data on girls and women only.

It is immediately apparent from Table 1 that there is variation among the figures. Prevalence of completed rape has been estimated at approximately 20% of adult women according to several different sources (24%, Burt, 1979; 23%, Kilpatrick et al., 1987; 21%, Koss, Woodruff, & Koss, 1991; 24%, Russell, 1984; 20% White women, 25% Black women, Wyatt, 1992). However, a group of studies have reported lower prevalences (8%, Essock-Vitale & McGuire, 1985; 9%, Kilpatrick et al., 1985; 14%, National Victims Center, 1992; 2%, Gordon & Riger, 1989; 2%, Riger & Gordon, 1981). Several studies have expanded their focus beyond rape to include lesser degrees of sexual victimization. These global assault figures theoretically should have

TABLE 1: Empirical Studies of Rape Prevalence Among Women

Study	Sample	Data Collection Method	Participation Rate	Type of Screening	Context of Questioning	Measured Phenomena & Prevalence Rate
Adolescent girls Ageton (1983a)	1,716 National	Interview	73%	Single item with word "rape"	Delinquency	Forced sexual behavior 5%-11% per year
Hall & Flannery (1984)	508 Ages 14-17	Telephone	56%	Single item	Sexual aggression	Rape and sexual assault 12% lifetime
Moore, Nord, & Peterson (1989)	565 Ages 18-22 National	Telephone	82% of Wave 2	Single item	Family conflict	Nonvoluntary sexual intercourse 12.7% Whites, 8.0% Blacks lifetime
College women Koss & Oros (1982)	2,106 Kent, OH	In-person survey	Not given	Scenario 13 items	Sexual aggression	Completed rape 12.7% lifetime
Koss, Gidycz, & Wisniewski (1987)	3,187 National	In-person survey	99%	Scenario 10 items	Sexual aggression	Completed rape 15.4% lifetime since age 14
Miller & Marshall (1987)	323 North Carolina	In-person survey	Not given	Scenario 11 items	Sexuality	Coerced or forced intercourse 27% while at university
Yegidis (1986)	348 Tampa, FL	In-person survey	Not given	Not given	Sexual aggression	Forced sexual encounter 22%

(continued)

TABLE 1 Continued

Study	Sample	Data Collection Method	Participation Rate	Type of Screening	Context of Questioning	Measured Phenomena & Prevalence Rate
Adult women Burt (1979)	328 Minnesota	Interview	n.a.	n.a.	Rape attitudes	Completed rape 24% lifetime
Essock-Vitale & McGuire (1985)	300 Ages 35-45 Los Angeles	Interview	66%	Gate	Sexuality/ reproduction	Rape 8% since age 18
Kilpatrick, Best, Veronen, Amick, Villeponteaux, & Ruff (1985)	2,004 Charleston, SC	Telephone	78%	Not given	Crime	Forcible rape including attempts 8.8% lifetime
Kilpatrick, Saunders, Veronen, Best, & Von (1987)	399 Charleston, SC	Interview	20% of 1985 sample	Not given	Crime	Completed rape 23.3% lifetime
Riger & Gordon (1981); Gordon & Riger, 1989)	693 Chicago Philadelphia San Francisco	Telephone interview and telephone (N = 299)	Not given	Single item with "rape"	Crime	Rape or sexual assault 2% telephone sample, 6% of volunteers surveyed by telephone, 11% of volunteers at interview
National Victims Center (1992)	2,008 nationally representative 2,000 oversample Ages 18-34	Random-digit dial telephone	85%	Scenario	Crime	Completed rape lifetime excluding rape when unable to consent 14%
Russell (1984)	930 San Francisco	Interview	50%	Scenario 38 items	Sexual assault	Completed rape 24% lifetime

Sorenson, Stein, Siegel, Golding, & Burnam (1987)	766 Hispanics 678 non-Hispanic Whites	Interview	68%	Gate	Mental illness	Sexual assault 13.5% since age 15
Winfield, George, Swartz, & Blazer (1990)	1,157 North Carolina	Interview	77% of Wave 1	Gate	Mental illness	Sexual assault 5.9% lifetime
Wyatt (1992)	126 Blacks 122 Whites Ages 18-36 Los Angeles	Interview	55%	Scenario 4 items	Sexuality	Completed rape 25% Blacks 20% Whites since age 18
Special groups. Goodman (1991)	50 housed 50 homeless	Interview	65%	Scenario modification of Russell	Violence	Very severe abuse including forcible and nonforcible rapes and attempts 20% homeless 56% housed
Jacobson & Richardson (1987)	50 psychiatric patients	Interview	42%	Not given 15 items	Violence	Sexual abuse 38% since age 16
Koss, Woodruff, & Koss (1991)	2,291 medical patients Cleveland, OH	Mailed survey and interview	45% 18%	Scenario 5 items	Health	Complete rape 21% by survey 30% by interview

been higher than completed rape prevalence, but they were not (6%, Winfield et al., 1990; 17%, Sorenson et al., 1987).

Less variation is seen among the estimates for adolescent girls and special populations. A prevalence of sexual assault of approximately 12% for girls up to age 18 is typical (Ageton, 1983a; Hall & Flannery, 1984; Moore et al., 1989). Prevalence percentages of sexual assault among female psychiatric inpatients varied from 38% (Jacobson & Richardson, 1987) to 49% (George & Winfield-Laird, 1986). Among incarcerated female prisoners, the prevalence of sexual assault including both preincarceration and incarceration experiences was reported to reach 100% (George & Winfield-Laird, 1986).

The rates of sexual assault prevalence among men and adolescent boys (not shown in Table 1) are consistently lower than the rates for women and girls with the exception of gay men and lesbian women. Lesbian women report rates of sexual assault that are only about half as high as gay men experience (Berrill, 1990). In general, in adult male samples collapsed across sexual orientation, sexual assault prevalence rates vary from 0.6% (George & Winfield-Laird, 1986) to 7% (Sorenson et al., 1987). Neither of these sources provided a disaggregated rate for rape of men. Rates of involuntary sexual contact among adolescent boys are reported to be 2% for Whites and 6% for Blacks (Moore et al., 1989). Among male psychiatric inpatients the prevalences of sexual assault histories have been reported as 0% (George & Winfield-Laird, 1986) and 4% (Jacobson & Richardson, 1987). Sexual assault prevalence among male incarcerated prisoners has been reported to be 8% (George & Winfield-Laird, 1986).

METHODOLOGICAL CHOICES THAT MAY INFLUENCE RAPE DETECTION

The search for the causes of variation among prevalence estimates logically begins with a description of the processes that must occur for an instance of rape to be captured in the findings of a victimization study (Sparks, 1982). First, an incident must occur to the respondent and she or he must perceive the event and label it in some way. Unlike crime statistics where a report may result if a bystander or police officer observes a crime, the respondent is the only person who determines whether an incident will be recorded on a victimization survey. But, she or he cannot reveal the crime unless they are included in the sample that is studied. Even if selected as a participant, a person cannot volunteer the experience if the screening questions use different labels from those of the respondent and thus fail to jog memories for relevant experiences. And, even if the respondent does recall the incident and

retrospectively defines it as one of the kind that the interviewer seeks, she or he must be willing to reveal the incident to the interviewer. If revealed, the interviewer must correctly record the incident. Finally, the data must be accurately and appropriately edited, coded, keypunched, and statistically analyzed.

Prevalence estimates are vulnerable to two potentially serious threats to validity: fabrication and nondisclosure (Skogan, 1981; Sparks, 1982). Fabrication refers to a respondent's tendency, for whatever reason, to make up false reports of victimization. Although concerns about the potential for overreporting of victimization have been expressed (Levine, 1976), it is generally believed that extensive fabrication is unlikely. This conclusion is partially based on the intuitive belief that positive responses to screening questions initiate a long series of follow-up questions that would be difficult, if not impossible, to make up realistically and consistently (Sparks, 1982). In addition, studies of self-reported burglary, robbery, and assault have revealed no substantial evidence that people simply fabricate incidents (Sparks, 1982). No evidence for fabrication of rape was found by Koss and Gidycz (1985) in a study of 68 women who disclosed rape to an interviewer, were asked to provide a brief narrative description of their experience, and were subjected to lengthy detailed questioning about the incident. Only two reported incidents (3%) were identified that failed to contain the elements of rape as defined by the investigators or appeared to be misrepresented (Koss & Gidycz, 1985). Although there may be other influences that lead to inflation of prevalence estimates, fabrication is not a major source of invalidity.

Instead, nondisclosure is considered to be a much more serious threat to the validity of victimization data (Ageton, 1983b; Catlin & Murray, 1979). All the information from which the generalizations about the scope of rape can be made depend on information volunteered by victims themselves (Hindelang & Davis, 1977). But a hesitancy to disclose rape is fostered by our historical tradition of skepticism toward rape victims and denigration of them as damaged goods. The desire to withhold information about victimization often can be quite high; in one study only 54% of acquaintance rape victims who had reported their assault to police were willing to reveal to an interviewer that they had been raped (Curtis, 1976). Nondisclosure can be of two types: *purposive nonreporting* (withholding relevant experience) and *unintentional nonreporting* (lack of recall). Any data collection effort that purports to describe rape prevalence must include methods to overcome the compelling forces that favor nondisclosure.

This overview of the processes involved in the collection of victimization data has identified numerous points where methodological choices could

affect the magnitude of the resultant rape prevalence estimate. These choices are examined in the material that follows.

Definition of Rape

An obvious explanation for differences in prevalence estimates would be variation among studies in the definition of the measured phenomena. One of the earliest steps in research design is to define the construct to be measured thereby creating a conceptual foundation for the wording of screening questions and for the formulation of decision rules regarding inclusion and exclusion of reported incidents. But in many prevalence studies no explicit definition is presented. Instead, it must be inferred by examination of the text of screening items, if it is provided (e.g., Essock-Vitale & McGuire, 1985; Hall & Flannery, 1984; Moore et al., 1989). A subset of the studies summarized in Table 1 presented formal, legally grounded definitions of rape (e.g., Kilpatrick et al., 1985; Kilpatrick et al., 1987; Koss et al., 1982; Koss et al., 1987; Koss et al., 1991; National Victims Center, 1992; Russell, 1982; Wyatt, 1992). Considerable parity exists among these definitions because all derived from reform legal statutes. Thus forms of penetration other than penile-vaginal were included as rape and no spousal exclusion was observed. There were several discrepancies also. The first is nonforcible rape of an incapacitated victim that has been included (e.g., Koss et al., 1982; Koss et al., 1987; Koss et al., 1991) or excluded (e.g., Kilpatrick et al., 1985; Kilpatrick et al., 1987; National Victims Center, 1992). The second discrepancy is statutory age. Sometimes lifetime prevalence rates were calculated including childhood incidents that would legally qualify as statutory crimes or child abuse, but not as rape (e.g., Hall & Flannery, 1984; Kilpatrick et al., 1985; Kilpatrick et al., 1987). Where a lower age boundary for the prevalence period has been specified, various ages were chosen including age 14 (Koss et al., 1987; Koss et al., 1991), age 16 (Sorenson et al., 1987), and age 18 (Russell, 1982; Wyatt, 1992).

A further issue is the sex neutrality of reform statutes, which has been ignored in all but a handful of studies (exceptions are George & Winfield-Laird, 1986; Sorenson et al., 1987). Instead, focus has been restricted to female victims. This restriction makes practical sense because over 90% of the rapes identified in the National Crime Victimization Survey (NCVS) involve female victims (Jamieson & Flanagan, 1989). Although consideration of male victims is within the scope of the legal statutes, it is important to restrict the term rape to instances where male victims were penetrated by offenders. It is inappropriate to consider as a rape victim a man who engages

in unwanted sexual intercourse with a woman (e.g., Struckman-Johnson, 1991). A final problem is the practice of summing attempted and completed rapes. Although it follows common-law practice to include attempted rapes in the figure presented as "rape prevalence," separate reporting of attempted and completed rapes is more precise and less prone to confusion when comparing across studies (Block & Block, 1984).

Rather than rape, some researchers have adopted the construct of "sexual assault" (Hall & Flannery, 1984; Sorenson et al., 1987; Winfield et al., 1990). The intent in these studies has been to include a range of experiences including sexual abuse in childhood, nonforcible, verbally coerced sex, unwanted contacts with genital parts of the victim's body, as well as attempted and completed rape. The following definition of sexual assault is typical of this literature, "Sexual assault was defined as being pressured or forced to have sexual contact" (Sorenson et al., 1987, p. 1156). Although it is a legitimate aim to document a range of unwanted sexual experiences, use of the term "sexual assault" to describe what is measured is potentially confusing. In legal usage sexual assault is synonymous with rape. Less misunderstanding would be created by using terms without legal connotations such as "nonconsensual sexual activity" (e.g., Moore et al., 1989).

Examination of Table 1 reveals that the relationship between definition and the resultant magnitude of prevalence estimate is not direct. Global sexual assault estimates typically have been similar to or lower than the conceptually narrower estimates of rape. And even when studies are grouped according to similar definitions, variation does not disappear. For example, two studies by Kilpatrick et al. (1985, 1987) were based on the same legally grounded definition of rape. But the prevalence rates reported for completed rape varied from 4.5% to 23%.

Screening Questions

Screening questions communicate to the respondent the kind of incidents the interviewer wishes to have recalled. It has been recognized since the early years of victimization surveys that, "the quality of the reports of victimization that are elicited by our interviewers depends to a considerable degree upon how the task of remembering and reporting is structured by the interview schedule" (Biderman & Reiss, 1967, p. 52). Several investigators have screened with questions that contain the word "rape" (Ageton, 1983a; Essock-Vitale & McGuire, 1985; Gordon & Riger, 1989; Moore et al., 1989; Riger & Gordon, 1981). A typical item is, "Have you ever been raped or molested?" (Essock-Vitale & McGuire, 1985, p. 149). This wording assumes that vic-

timized persons knew how rape is defined, perceived what happened to them as rape, and remembered the experience with this conceptual label. However, Koss (1988) reported that only 27% of college women labeled their experiences with forced, unwanted intercourse as rape. Further, some respondents hesitate to answer yes to the word "rape" because they wish to avoid the devaluation and social stigma that is associated with the role of rape victim. The data in Table 1 suggest that directly asking respondents if they have been raped was associated with low prevalence estimates among adult women (8%, Essock-Vitale & McGuire, 1985; 6% by telephone and 11% in person, Gordon & Riger, 1989; Riger & Gordon, 1981). An exception to this trend is work by Wyatt (1992) that included the word rape in screening, but accompanied it with an extensive explanation of its intended meaning.

Other approaches to screening for rape have adopted colloquial or euphemistic language in an attempt to reduce offensiveness and bluntness. Typical of such items are, "Has a guy ever used physical force or threatened you to make you have sex when you didn't want to?" (Hall & Flannery, 1984, p. 400) or "Has anyone ever tried to make you have sexual relations with them against your will?" (Kilpatrick et al., 1985, p. 868). Colloquial terms like "sex" and "sexual relations" may fail to stimulate recall in some respondents because they do not consider oral or anal sex or penetration with objects as normal sexual relations. Also, women may interpret the term "sexual relations" to imply completion, whereas only slight penetration is sufficient for rape. Among men, the terms "sex" and "sexual relations" may activate schemas for situations in which they penetrated women. Clarification is necessary to ensure that male respondents realize that the situations of interest are those in which they were penetrated forcibly and against their will by another person, and not situations where they felt pressure or coercion to have sexual relations with a woman partner.

In addition to the language used, screening items vary in strategy. Two conceptually different approaches are seen: gate questions and behaviorally specific scenarios. Wyatt and Peters (1986) have used the expressions "wide funnel" and "inverted funnel" to make an analogous distinction.

Gate Questions

A gate question is a single item intended to stimulate recall of a range of sexually unwanted experiences. Data on specific experiences within this range, such as rapes or the most recent assault, can be amplified through detailed inquiry later in the interview. A typical gate question is, "Have you ever been in a situation in which you were pressured into doing more sexually

than you wanted to do, that is, a situation in which someone pressured you against your will into forced contact with the sexual parts of your body or their body?" (Winfield et al., 1990, p. 337). Gate questions have been widely used in prevalence studies because of their perceived advantage of time economy (e.g., Kilpatrick et al., 1985; Moore et al., 1989; Sorenson et al., 1987; Winfield et al., 1990). But there are reasons to suspect the efficacy of the gate strategy to detect rape. Sheatsley (1983) has warned, "valid answers to such topics [taboo items] require careful introduction, proper survey auspices, and a well-planned line of questioning that does not depend on one or two blunt items" (p. 196). Examination of Table 1 reveals that use of the gate item strategy has been associated with low prevalence percentages for both sexual assault (6%, Winfield et al., 1990; 17%, Sorenson et al., 1987) and rape (9%, Kilpatrick et al., 1985). It seems that a single item simply cannot cue the respondent to recall the variety of guises under which rape can occur including unwanted sex with a stranger or with someone they knew, that was forced or involved only verbal threats of harm, that was not forceful but occurred when incapacitated, that entailed penile-vaginal intercourse or other forms of penetration, that was an attempt to rape but stopped before penetration, or that was reported to police or kept completely secret.

Behaviorally Specific Questions

Ageton (1983b) concluded that future research on rape

must employ precise behavioral and physical definitions of the forced sexual behavior of interest. Prima facie, there is too much disagreement and ambiguity about the meaning of such phrases as "being raped," "sexually assaulted," or "forced sexually" for them to act as constant stimuli for all respondents. (p. 42)

Behaviorally specific screening questions attempt to put before the respondent detailed scenarios for the type of experiences the interviewer seeks to identify. Research on the organization of autobiographical memory (Rubin, 1986) has implications for the development of effective strategies for detecting rape. This literature suggests that personal memories are stored in categories with similar content. Consequently, it is important to know how individuals label the incidents that investigators are calling rape. Three-quarters of college women who have been raped fail to use this term as the label for their experience (Koss, 1988). Rather, they choose terms such as "unwanted sexual experience," "unpleasant sexual encounter," "sexual miscommunication," and "sexual assault."

Within categories certain experiences are especially memorable simply because they differ from the typical experiences of that type. Recall may be most fully stimulated by using screening items that direct respondents to the appropriate memory category (i.e., sexual experiences) and then providing multiple clues that distinguish the desired target from the typical sexual experience (i.e., unwanted, negative or unpleasant, involved physical force, when you were unable to consent). One recent approach was to direct women's recall to "experiences that are not pleasant kinds of sex" (Koss et al., 1991). Then two of the five screening items used were the following: "Has a man made you have sex by using force or threatening to harm you? When we use the word 'sex' we mean a man putting his penis in your vagina, even if he did not ejaculate (come)?" and "And, even if he did not try to put his penis in your vagina, has a man made you do other sexual things like oral sex, anal sex, or put fingers or other objects inside you by using force or threatening to harm you?" (p. 5). Also important is the specification of the behaviors involved in attempted rape so that reports are limited to the instances where the offender actually took preliminary steps to achieve penetration, rather than instances where the victim simply thought the offender intended to have sexual intercourse. For example, "Have you had a man attempt sexual intercourse (get on top of you, attempt to insert his penis) when you didn't want to by threatening or using some degree of force (twisting your arm, holding you down, etc.) but intercourse *did not* occur?" (Koss et al., 1987, p. 167).

Other item characteristics known to influence the number of victimizations reported include the placement of the detailed incident questions relative to the screening questions (Sparks, 1982) and whether respondents are directed to recall from the past forward or from the present back (Loftus, Fienberg, & Tanur, 1985). If respondents are given detailed follow-up questions after each screening question to which they give an affirmative reply, the total number of victimizations they report on the survey will be lower than if they were given all the screening items first. A second variable that may effect the number of victimizations reported is the length of the recall period. Rape is clearly a salient event and it is possible that it results in highly indelible "flashbulb memories" (Brown & Kulik, 1977). However, the maximum interval over which recall can be expected is an empirical question that has not been studied. It is possible that older respondents have forgotten some relevant events. In addition, given the reconstructive properties of autobiographical memory (Greenwald, 1980), it is possible that some youthful sexual experiences once viewed as traumatic go unreported at later ages because they have been re-interpreted in light of intervening experiences.

Examination of the studies in Table 1 suggests that presentation of multiple, behaviorally specific screening questions often resulted in prevalence rates for completed rape among women of approximately 20% (Kilpatrick et al., 1987; Koss, Koss, & Woodruff, 1991; Russell, 1984; Wyatt, 1992). Multiple questions may give the participant time to think over their answers, a strategy that has been found to improve recall (Loftus, Fienberg, & Tanur, 1985).

Context of Questioning

Many of the prevalence estimates reported in Table 1 derived from larger studies on which questions about rape or sexual assault were piggy-backed, including the National Youth Study (Ageton, 1983a), Epidemiological Catchment Area Studies (George & Winfield-Laird, 1986; Sorenson et al., 1987), and National Survey of Children (Moore et al., 1989). In each of these cases, the primary focus of the project dictated the overall context in which questioning about rape would occur. These contexts could impact on the respondent's ability to remember the appropriate set of experiences. Shulman and Presser (1981) warn that "a major threat to the interpretation of any question form difference—or indeed any survey result at all—is the possible impact of preceding parts of the questionnaire" (p. 23).

If the major content of an interview has been psychiatric symptoms, the respondent may carry over to the rape questions the set to think only about more deviant and bizarre experiences. A survey focused on crime may stimulate recall only of those sexual experiences that met stereotypes of "real rape," which the respondent viewed as police matters (Estrich, 1987). These difficult contexts challenge investigators to design procedures to dispel unwanted carryover effects. One method for achieving separation has been to isolate the rape items from other crime items and to label them as "unwanted sexual experiences," thereby implying that they are different from "crimes" (Koss et al., 1991). A second method that may be used in addition to physical separation is to provide a special introduction to the rape items that emphasizes the ways in which the unwanted sexual advances investigators wish to measure differ from the preceding line of inquiry. To dispel a crime context, respondents may be told that they will be asked about unwanted sexual experiences and they should report any incidents they remember even if they were not reported to the police or discussed with family or friends, even if they were not very forceful, and even if they involve friends, boyfriends, or even family members (National Victims Center, 1992).

Table 1 contains two recent studies that employed context-modifying procedures in combination with behaviorally specific screening. Both a relatively high (21%, Koss et al., 1991) and a moderate prevalence estimate resulted (14%, National Victims Center, 1992). However, these two studies differ in other ways. The former study employed a confidential mailed survey of a localized, specialized population; the latter study involved telephonic data collection in a national sample. The influences of method of data collection and sample composition on prevalence estimates are discussed in the material that follows.

Method of Data Collection

All of the major data collection methods have been used in the measurement of rape prevalence including face-to-face interviews, mailed surveys, in-person surveys, and telephone surveys. There is an extensive literature on each of these methods (e.g., Dillman, 1983; Klecka & Tuchfarber, 1978). It is the general consensus in the literature that telephone and in-person interviews are equivalent (e.g., Klecka & Tuchfarber, 1978). However, rape is perhaps the ultimate sensitive topic and generalization of previous work to this specialized inquiry cannot be assumed automatically. Therefore, the few methodological comparisons that focused on rape are of primary importance.

The studies summarized in Table 1 reveal no clearcut tendencies for prevalence rates to covary by method. The higher prevalence rates have been generated both by in-person interviews (Burt, 1979; Russell, 1984; Wyatt, 1992) and mailed self-report survey (Koss et al., 1991). On the other hand, interview methods have also resulted in several of the lower prevalence rates (Essock-Vitale & McGuire, 1985; Riger & Gordon, 1981; Sorenson et al., 1987; Winfield et al., 1990), although deficiencies have been previously noted in the single screening item used in each of these studies. Telephone surveying has uniformly produced lower prevalence rates. The only direct comparison of telephone and in-person interviewing began with a telephonic survey of 693 women in a three-city sample (using a single screening question that directly inquired about rape). This procedure generated a prevalence rate of 2% (Riger & Gordon, 1981). Then participants were asked to volunteer for an interview. A subsample of these volunteers was interviewed using the same questions both in person and over the telephone. The prevalence of rape was 6% based on telephone responses and 11% based on in-person interview responses (Riger & Gordon, 1981). To date the finding that disclosure of rape was lower in telephone data collection as compared to in-person interviewing has not been satisfactorily refuted.

Confidentiality and Rapport

Although investigators routinely assure participants that their responses are confidential, this guarantee is less persuasive with members of ethnic groups whose cultural history has led them to distrust authority figures or governmental representatives. The value of the confidentiality assurance also pales when the participant cannot control the privacy of the setting in which responses are to be given. It is not uncommon in the prevalence literature to find that others were present during the time when screening for rape occurred (e.g., George & Winfield-Laird, 1986; Sorenson et al., 1987; Winfield et al., 1990). In the case of telephonic administration, the setting surrounding the respondent may be unknown to investigators (Gordon & Riger, 1989; Kilpatrick et al., 1985; National Victims Center, 1992). When others may overhear, it is possible that some victims deny the rape screening questions. In fact, police files contain approximately 3½ times more acquaintance violence than is revealed in victimization interviews administered in households (Skogan, 1981).

There are two reasons why victims might fail to disclose rape in front of family members: the assault has been kept secret or the perpetrator is among those present. Victims of rape frequently have hidden their assault even from significant others. For example, 42% of women college student rape victims indicated on a self-report survey that they had never told anyone at all about the incident (Koss et al., 1987). Further, rape is more likely to be kept secret than other forms of victimization. Whereas 100% of noncontact and physical assault victims confided in their family, only 27% of rape victims did (Koss et al., 1991; also see Kilpatrick et al., 1987). It is also clear that the majority of rapes reported in victimization surveys are perpetrated by male relatives, current or former husbands, boyfriends, and lovers (Koss et al., 1991; National Victims Center, 1992; Russell, 1982).

The impact of confidentiality on disclosure was examined by Sorenson and colleagues (1987). Although half of their interviews were conducted with other family members present, disclosure rates did not differ according to level of confidentiality. However, this finding may have been influenced by the nonspecific single screening item that was used in the investigation and the low overall disclosure rate that was obtained.

The gender and ethnic characteristics of interviewers may also contribute to the level of victimization that is detected. It is well-known that "interviewing procedures could *drastically affect* the amount of victimization mentioned by survey respondents" (Sparks, 1982, p. 46, emphasis added). Interviewer effects are most substantial for sensitive topics, particularly rapes, intrafamilial disputes, and public brawling (Bailey, Moore, & Bailar, 1978).

To the extent that rape is stigmatizing, people may be less willing to discuss it with a stranger of different sex and ethnicity from themselves. This may be particularly true among several major ethnic groups of the United States whose mores discourage intimate interactions between women and men who are not their husbands. Several projects have involved both male and female interviewers and did not attempt to match with the gender of the respondent (Sorenson et al., 1987; Winfield et al., 1990). In one study it was found that respondents were 1.3 times more likely to reveal sexual assault to a female as opposed to a male interviewer (Sorenson et al., 1987).

Sample Composition

Sexual assault prevalence varies with sociodemographic characteristics (George, Winfield, & Blazer, 1992; Sorenson & Siegel, 1992). Most of the samples summarized in Table 1 are localized and/or specialized. A few studies involved multicity (Riger & Gordon, 1981) or national samples (Ageton, 1983a; Koss et al., 1987; Moore et al., 1989; National Victims Center, 1992). In some cases such as research on college students, the nature of the population naturally resulted in participants who were younger or above average in education. But, even with random or representative sampling of the general community, it was frequently the case that those who agreed to be interviewed were slightly younger than the population from which they were drawn (Kilpatrick et al., 1987; Riger & Gordon, 1981; Russell, 1982). And, where education has been examined, participants also had above average educational levels (Riger & Gordon, 1981). This is true because the sensitive nature of rape means that not all those targeted for inclusion in the sample can be expected to agree to participate, and the decision to participate may be associated with age and education. This phenomenon is known as *differential participation*. To the extent that those variables associated with the decision to participate covary with victimization, they could influence the magnitude of prevalence estimates.

Age is clearly related to the occurrence of rape. Only 12% of the sexual assaults reported by a national sample of women occurred after age 25 (National Victims Center, 1992). The trend for rape occurrence to vary with age is also seen in federal incidence data (Bureau of Justice Statistics, 1990). Nevertheless, in prevalence research when adult women are recalling their past, each woman has the potential to look back and report on her entire life including the years during which she was at peak risk for rape. Therefore, in theory the rape prevalence rate should not decline as one moves from samples with younger mean ages to samples with older mean ages unless there have

been changes over the years in the amount of rape that occurs. In the absence of cohort effects, the rate should increase but at a decelerating pace. The only study that provided prevalence estimates by age demonstrated neither straightforward cohort effects, nor provided a pattern of decelerated increases. The prevalence estimates were highest in respondents aged 25 to 44 years (13%) and decreased in respondents aged 18 to 24 (11%), 45 to 64 (8%), and over age 65 (5%) (Sorenson et al., 1987). Other possible explanations for these findings are that older respondents (who have a longer recall period than younger respondents) have forgotten some relevant experiences or may have reinterpreted them in the light of intervening experiences, or that willingness to disclose sexual matters varied by age and cohort. These are all subjects that have yet to receive empirical study.

Education may also influence prevalence estimates. Traditional opinion has been that college-educated respondents recall more crimes than others, particularly in the category of assaultive violence (Skogan, 1981). This phenomenon is called *differential productivity* and is thought to be related to the willingness of test-wise respondents to adopt a productive set (Sudman & Bradburn, 1974). For example, Sorenson et al. (1987) reported a significant three-way interaction of education (with sex and age) on sexual assault prevalence. The highest levels of sexual assault (28%) were reported by non-Hispanic White women aged 18 to 39 years with some college education compared to a rate of 16% among White women collapsed across age and education levels. Persons with lower education and income intuitively would seem more vulnerable to rape by virtue of living in central cities, using public transportation, and being economic victims in the society. If the data do not support this intuition, one must consider the possibility that methods have not yet been found that facilitate disclosure of sexual assault among them.

The ethnic composition of the sample may also affect the resultant prevalence estimates. Except for college students, sexual assault is slightly more prevalent among African-American women compared to White women (Koss et al., 1987; Russell, 1984; Wyatt, 1992). The prevalence rate of sexual assault among non-Hispanic Whites has been reported to be 2.5 times higher than that of Hispanics (Sorenson & Siegel, 1992). To support this finding as a true difference, the researchers pointed out that prevalence varies with acculturation. Sexual assault is three times higher among Mexican-Americans born in the United States compared to Mexican-Americans born in Mexico. Although it is possible that traditional Hispanic culture is somewhat protective against sexual assault, the data are also consistent with the competing explanation that there is a culturally based reluctance to confide in authority figures about sexual assault that lessens with acculturation. In addition, the

screening question used in this study was long and subtly worded. Differences in ability to understand the intent of the question also may have occurred depending on English fluency. Fluency tends to increase as one becomes acculturated.

The level of previous exposure to sexual assault may also influence participation in victimization research. Although a plausible case could be built hypothesizing that victims would avoid research out of fear that participation would reawaken painful memories, some evidence suggests that victimization heightens motivation to participate. Gordon and Riger (1989) found a rape prevalence of 2% among their three-city sample that was surveyed telephonically. Among a subsample who agreed to be interviewed, the prevalence of rape was 6% again based on telephonic data collection. Similar findings are in the work of Kilpatrick et al. (1985). They reported a rape prevalence rate (including attempts) of 9% in a telephonic survey of Charleston, SC women (Kilpatrick et al., 1985). In a follow-up interview study of volunteers from the parent sample ($N = 399$), a prevalence rate of 36% was found (Kilpatrick et al., 1987). (However, the two studies also differed in the method of screening that changed from a gate question to behaviorally specific items.) Research makes time and energy demands on people. It may be that those who are not victimized have less motivation to make participation in a victimization study a priority compared with people who know firsthand the impact of sexual violence. Future research must determine if the differential participation effect grows larger according to the time and effort required from the respondent and the certainty that the topic of inquiry involves sexual assault.

CONCLUSIONS AND IMPLICATIONS FOR FUTURE RESEARCH

That rape prevalence estimates are sensitive to the methods used to measure them is evidenced by the variation among published studies. The foregoing review has addressed a number of these methods and attempted to discern how each was related to the magnitude of rape prevalence. With two exceptions the review highlighted no absolutes. First, it is widely accepted that underreporting of rape victimization is a greater impediment to validity than fabrication. Second, consensus appears to have emerged among several recent projects over the advantages of multiple, behaviorally specific screening questions over single items.

It is unfortunate that some of the best sampling occurred in projects where inquiry about rape was an add-on. As a result, less-than-optimal procedures for detecting rape and failure to ensure confidentiality and rapport limited

what could be concluded from otherwise broadly generalizable datasets. Variability among prevalence estimates is most apparent for adult women. The estimates fall into a group of studies that report lower prevalence rates (8%-14%) and a group that reports higher prevalence rates (over 20%). Some of the lower prevalence rates clearly reflect choices of methods that resulted in a relative lack of success in overcoming the forces that foster nondisclosure of rape. Most of the higher prevalence rates raise concerns about some degree of differential participation by those who were younger, more educated, and more likely to have experienced sexual assault. These observations do not necessarily suggest that the prevalence rates obtained were inflated. They may equally suggest that methods have not yet been found to facilitate recall in those who are less educated or older and facing a long recall period. Although variability is less among prevalence estimates for men and special populations, this state of affairs is falsely reassuring. The number of methodological differences among these studies suggest that the differences should be greater. The 14% prevalence released by the National Victims Center (1992) appears to be the middle ground. It has the advantage of a national sample and state-of-the-art techniques for questioning about rape. But there are good reasons to regard this figure as a conservative estimate of the true scope of rape. First, the definition underpinning the study excluded nonforcible rapes that occurred when the woman was incapable of giving consent; these are considered legitimate rapes in the majority of states. Second, the sample excluded high-risk groups of women who reside in group living quarters such as college students, psychiatric patients, prisoners, and women military personnel. Third, inclusion in the sample required telephone ownership. Although telephone ownership is generally high in the United States, there are important groups among whom it is low, such as Native Americans residing on reservations. Last, data collection was by telephone and it has not been demonstrated conclusively that rape detection is as high as can be obtained in person (Gordon & Riger, 1989).

Under these circumstances confident assertions regarding the true scope of rape remain premature. Still to be addressed are major questions about factors that influence the magnitude of prevalence estimates, not the least of which are the impact of very long recall periods, the effects of reconstructive memory, cohort effects, the impact of mode of data collection on recall, and the magnitude of differential participation. In addition, throughout this literature insufficient attention has been paid to documenting variation in vulnerability to rape by ethnicity and class. If the face-to-face interview is the gold standard in epidemiology, it must be concluded that an exemplary study of rape prevalence with a nationally generalizable database does not

yet exist and that the burden of sexual violence in people's lives has yet to be adequately captured.

Rape has traumatic consequences and no mental health agenda will be complete without attention to the prevalence, causes, and consequences of sexual victimization. The following recommendations are drawn from the foregoing review to summarize the current state of the art in anticipation of future efforts to capture the true scope of rape:

1. A clear conceptualization of rape or sexual assault is required as the foundation of the study. Without it, there are no grounds on which to evaluate the content validity of the screening questions that are developed. A comprehensive definition of rape includes the following elements: force, nonconsent, penetration, and statutory age.
2. If men and boys are to be included, care must be taken to ensure that their data are accurate counterparts of rape prevalence among women. This means that men must be reporting instances where they experienced penetration of their own body (or attempts).
3. Questions about a range of sexually assaultive experiences are legitimate. However, the methodology should allow for separate calculation of legally defined, completed, and attempted rape to facilitate comparison across studies.
4. Investigators need to grapple with the implications of statutory age for research. Methods must avoid double counting of incidents during adolescence in both rape rates and child abuse rates, and ensure that teenagers are screened for peer sexual assault in addition to adult-perpetrated sexual abuse.
5. Nationally representative or multistate samples should be attempted. Special populations including lesbian and ethnic women must be oversampled or become the focus of separate study to ensure that sufficient numbers of victims are obtained to provide risk analysis by group. Sexual orientation should be routinely assessed in this literature to facilitate examination of differential impact of rape and to more definitively guide service provision. Any methodology proposed must be reviewed for cultural sensitivity. Language must be used and understood by the group to be studied, interviewers must be culturally appropriate, time must be spent to build rapport, and methodology must assuage concerns about confidentiality that are culturally based.
6. Use of a "high-risk" strategy involving oversampling of respondents aged 16 to 34 years would increase the number of index cases available for analysis and avoid the lack of statistical power inherent in small samples. The sample plan must also include methods to address the potential bias introduced by differential participation.
7. The context surrounding the project should not mislead respondents or misguide their search for relevant experiences. If it is necessary to embed rape questioning in another research context, the items should be placed in a separate section with a special introduction designed to dispel unwanted carryover.
8. Screening questions must facilitate shaping and cuing of respondent's recall of relevant experience and provide sufficient time for the respondent to think about the answers. Behaviorally specific items may offend some people but

the ability to specify clearly the meaning of results is relatively more important than attaining the highest possible participation rate.

9. Method of data collection is less important than the attributes and training of the interviewer, their match with respondents, and the creation of a safe climate for self-disclosure. Investigators must ascertain that respondents are experiencing an effective confidentiality. In addition, investigators should include some multiple-methods comparisons in the design to allow for evaluation of any differential participation and effects by method and for feedback regarding the extent of disclosure fostered by each method.
10. The design should incorporate strategies for evaluating the accuracy of reports of rape. Major unanswered questions remain about the validity of the lifetime recall strategy especially among older respondents.

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