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The telescoping phenomenon: Origins in gender bias and implications for contemporary scientific inquiry

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Abstract

Background: In an article published in *International Journal of the Addictions* in 1989, Nick Piazza and his coauthors described “telescoping”, an accelerated progression through “landmark symptoms” of alcoholism, among a sample of recovering women.

Objectives: The aim of this critical analysis is to apply a feminist philosophy of science to examine the origins of the framework of telescoping research and its implications for contemporary scientific inquiry.

Methods: A feminist philosophy of science framework is outlined and applied to key source publications of telescoping literature drawn from international and United States-based peer-reviewed journals published beginning in 1952.

Results: A feminist philosophy of science framework identifies gender bias in telescoping research in three ways. First, gender bias was present in the early conventions that laid the groundwork for telescoping research. Second, a “masculine” framework was present in the methodology guiding telescoping research. Third, gender bias was present in the interpretation of results as evidenced by biased comparative language.

Conclusions: Telescoping research contributed to early evidence of critical sex and gender differences helping to usher in women’s substance abuse research more broadly. However, it also utilized a “masculine” framework that perpetuated gender bias and limited generative, novel research that can arise from women-focused research and practice. A feminist philosophy of science identifies gender bias in telescoping research and provides an alternative, more productive approach for substance abuse researchers and clinicians.

Keywords

telescoping; alcohol; gender; history of science; feminist philosophy of science

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INTRODUCTION

This is a critical analysis in the history of science and ideas about the phenomenon of telescoping. In an article published in *International Journal of the Addictions* in 1989, Nick Piazza and his coauthors defined “telescoping” as an accelerated progression of alcoholism, among a sample of recovering women (Piazza, Vrbka, & Yeager, 1989). Using terms and symptoms established by Alcoholics Anonymous (AA) advocate and Yale School of Alcohol Studies researcher EM Jellinek in the mid-twentieth century, Piazza examined the timeline of selected “landmark symptoms” of alcohol abuse (Piazza et al., 1989). The identification of these landmark symptoms in alcoholic progression was based on data that Jellinek gathered from men who abused alcohol (Jellinek, 1952). When men recalled their drinking careers, landmark symptoms on their alcoholic timeline included first drink, first drunk experience, first alcohol-related problem, and first treatment admission. Piazza showed that women report shorter intervals of time between age of first experiencing an alcohol-related problem and age of first treatment admission than men. Piazza and others concluded that women progress more rapidly through the stages of alcoholism than men and cemented the term “telescoping” as an illustrative analogy for this condensed (i.e., telescoped) timeframe. After Piazza defined the term in relation to alcoholism in 1989, researchers discovered that telescoping also occurred when women used drugs: female users of opiates and cannabis experienced problems faster, and entered treatment sooner than men (Hernandez-Avila, Rousanville, & Kranzler, 2004; Khan et al., 2013; Lewis, Hoffman, & Nixon, 2014). Telescoping research contributed to early evidence of critical sex and gender differences helping to usher in women’s substance abuse research more broadly.

The aim of this study is to apply a feminist philosophy of science to examine the framework from which telescoping research emerged in the United States in the mid-twentieth century. We begin with an introduction to relevant philosophical premises associated with a feminist philosophy of science. Next, we provide an overview of telescoping research beginning in 1952 and situate it within the prevailing ideas about women’s substance use and research priorities/philosophy. We then apply a feminist philosophy to the telescoping research to demonstrate that a “masculine” framework perpetuated gender bias. We contend that although telescoping research helped to mobilize substance use research among women, the term has perpetuated a biased conceptualization (i.e., “masculine” framework) in contemporary scientific inquiry and should be discarded. We conclude with recommendations for substance use researchers and clinicians based on a feminist philosophy of science framework to advance the field.

A Feminist Philosophy of Science Framework

A feminist philosophy of science arose in the 1960s as a subfield of academic feminism led by American and European feminist scientists and transitioned in the 1980s to feminist philosophers (Richardson, 2010). Although feminist philosophy of science represents a diverse set of philosophers and theoretical perspectives, several common themes have historically characterized the field. One core domain of feminist philosophy of science, which arose from philosophy of science more broadly, is that the scientific process is enmeshed within the communities and cultures that produce knowledge (Longino, 1990).

Homogenous scientific environments lacking diverse representation across domains such as sex, gender, culture, and theoretical orientation increase the opportunity for bias by rendering gender assumptions invisible (Richardson, 2010). Feminist philosophers emphasize that science should attempt to recognize underlying assumptions and biases and acknowledge them as relevant factors in the empirical process (Goldberg, 2006). Such bias in research is often systemic and endemic within the scientific community and therefore can be unintentional despite efforts of objectivity. As such, an aim of a feminist inquiry is to address the system as a whole rather than lay blame on a specific group or facet of the scientific process.

A second domain of feminist philosophy of science pertains to biased methodology in conducting scientific research. Historically, women have been underrepresented and, in many cases, excluded from research. As such, sex and gender bias remained undetected as the “masculine” framework was reinforced by primarily studying and treating males. In the United States, a lack of federal regulation perpetuated this undervaluing of women’s unique experiences and needs. Dedicated to ensuring that women’s health research is included in the scientific framework, the National Institutes of Health (NIH) Office of Research on Women’s Health was not established until 1990 and the NIH did not require the inclusion of women in NIH-funded research until 1993 (US Department of Health and Human Services, 2016). It would take more than a decade to require the inclusion of female cells and animals in NIH-funded research (Clayton & Collins, 2014). Despite these measures, formative research conducted primarily with males continues to serve as the theoretical and methodological foundation from which women’s research is based. Feminist philosophy seeks to identify such bias in scientific approach in order to reexamine the validity of accepted theories and practice applied to women.

A third domain of feminist philosophy of science pertains to biased generalization of research conducted with men (Campbell & Ectorre, 2011). In biased science more broadly, false universalism refers to the dominant group’s identity and experiences being standardized as the universal identity. Debra DeBruin, who served as an influential member of the United States’ NIH Office of Research on Women’s Health committee tasked with examining ethical issues of including women in clinical research, argues that “men’s identity and experiences serves, in effect, as the characterization or standard of what it is to be a person” (DeBruin, 1999, p. 132–133). False universalism minimizes the role of gender resulting in absent or ineffective clinical interventions for women.

The application of a feminist philosophy of science has practical value for substance abuse researchers and clinicians in at least three critical ways. A feminist philosophy of science framework (1) minimizes a “masculine” framework such that it does not dominate the research literature to the exclusion of other generative biases, (2) yields rival theories grounded in social and cultural factors producing novel research and clinical interventions, and (3) combats gender stereotypes and sexist practices which fail to live up to standards of good science and clinical practice. However, a “feminist” or maternalistic framework is not the solution to a “masculine” framework as bias would still be present (Campbell, 2000, 176–179). Instead, a feminist philosophy of science seeks to identify ways in which underserved groups, including women, are systematically disadvantaged through exclusion

or stigma and utilize philosophical frameworks to guide a more even application of scientific rigor. Such application has practical value for researchers and clinicians by improving knowledge of women's substance use and gender-specific interventions.

History of Telescoping Research

Foundational Background—E.M. Jellinek, a pioneer in the study of alcoholism, began his research in the decades following the repeal of national alcohol prohibition in the United States. His ideas about alcoholism were shaped by his interactions with members of the new organization AA, who told temperance-style tales of “hitting bottom” before finding salvation through a twelve-step program (Jellinek, 1946, p. 11). In 1945, Jellinek identified 43 symptoms progressing through three stages of alcoholism (i.e., prodromal, crucial, chronic) by asking AA members to recall their age at which key points in their drinking careers occurred (Jellinek, 1946). Symptoms assessed included preoccupation with alcohol, loss of control, persistent remorse, job loss, geographic escape, and first hospitalization (Jellinek, 1945). The 36-item survey, designed by AA and mailed to members through their newsletter, *AA Grapevine*, received a 10 percent response rate; data were analyzed for 98 men. Although 15 women participated in the questionnaire, their data “were excluded from the analysis because on the one hand the number was too small to be analyzed separately, and on the other hand the data differed so greatly for the two sexes that merging the data was inadvisable” (Jellinek, 1946, p. 6). Jellinek, however, did not further specify the nature of the differences between women and men. The symptom progression and stages of alcoholism were later replicated in over 2,000 participants and remained grounded exclusively in the experience of male, AA members (Jellinek, 1952; World Health Organization, 1952). This progressive disease concept formalized by Jellinek in the United States and adopted by many other substance abuse researchers across the globe formed the basic premise of telescoping; substance use escalates in a predictable manner over time and, without intervention, will result in premature death.

Clinical observations that alcoholism, as described by Jellinek (1946, 1952), presented differently in women and men served as a precursor to telescoping research. Indeed, Jellinek (1946) advised that future research devise separate questionnaires for women. In 1952, the World Health Organization (WHO) convened an Expert Committee on Mental Health in Copenhagen to discuss the problem on alcohol with the aim of making recommendations for the organization of rehabilitation facilities. The Technical Report published from this committee stated that “for alcoholic women, the phases (of alcoholism) are not as clear cut as in men and the development is frequently more rapid” (WHO, 1952, p. 29). This early international acknowledgement of gender differences provided an impetus for later women-focused substance use research.

In a review of the contemporaneous clinical opinions and hypotheses regarding alcoholic women, American psychologist Edith Linsansky Gomberg cited the 1952 WHO report and first used the term “telescoped development” in 1958 to describe the observation that women's alcoholism differed in presentation and course from men (Linsansky, 1958, p. 76). Linsansky, a female clinician-scientist, noted the lack of empirical research on alcoholism in

women and provided an early cautionary statement regarding stereotypes influencing research on women's alcohol use.

Her groundbreaking stance renounced the moral model affirming the metaphor of alcoholism as a kind of moral descent or loss of virtue, rather than a medical condition. Yet Liansky's opinion was outside the norm; early telescoping research was situated within a common philosophy among researchers and clinicians that alcoholic women displayed greater levels of psychopathology and maladjustment than alcoholic men (Beckman, 1975). Measures on which this assertion was based included increased levels of psychiatric treatment, perceived marital instability, inadequate parenting, and incidence of mental illness relative to men (Beckman, 1975; Curlee, 1970).

Empirical Research—Early empirical evidence for differences in the trajectory and consequences of alcoholism between women and men arose from observational studies conducted at treatment programs, state hospitals, and self-help groups. For example, in 1977 American sociologist Harold Mulford administered the Iowa Alcoholic Intake Schedule (Jacobson, 1976), a standardized interview validated among men, to compare the symptoms and consequences of alcoholism among 3,132 men and 395 women recruited from community alcoholism service centers (Mulford, 1977). Mulford observed that women arrived for treatment approximately two years after their first attempt to quit drinking whereas men arrived three years following their first quit attempt. To understand why the drinking patterns of women diverged from men, emphasis was placed on differences in psychopathology, personality, cognitive performance, and family history (Beckman, 1975; Curlee, 1970; James, 1975; Mulford, 1977).

Differences in social roles were also explored as mechanisms underlying the phenotypic expression of alcoholism in women. For example, the “hidden housewife hypothesis”, noted by Mulford (1977, p. 1631), supposed that women should arrive to treatment later than men because women could drink in secret and were sheltered from the consequences of alcoholism traditionally associated with men (i.e., loss of employment). In contrast, social roles were also hypothesized to exacerbate the telescoping effect. The “double standard hypothesis”, referencing the higher moral standard for women than men, predicted that women should enter treatment for alcohol sooner than men due to a lower threshold of social tolerance (Mulford, 1977, p. 1636). Both social explanations utilized stereotyped generalizations of women as viewed from a male perspective.

In a manuscript published in 1975, American counselor Jane E. James called attention to the inadequate methodology employed to identify sex and gender differences in alcoholism between women and men (James, 1975). James recognized the need to empirically determine the symptoms and stages of alcoholism separately for women and developed a women-specific questionnaire. The questionnaire comprised 39 questions based on Jellinek's (1952) and Glatt's (1958) research as well as 85 questions developed from experiences reported by recovering women, one of the first of its kind. Topics unique to James' questionnaire included day-to-day activities related to parenting as well as coping mechanisms not previously assessed such as, “did you try to control your drinking by getting a job or doing volunteer work?” (James, 1975, p. 1566–1567) as well as menstruation and

pregnancy. The temporal relationship between other drug use, primarily tranquilizers commonly prescribed to women, and alcohol use was also assessed. Questionnaires were disseminated through AA's Grapevine and a response rate of 15 percent was obtained representing 89 women. Respondents were approximately 45 years of age and reported average continuous abstinence of three years (range, 1–19 years). In a subset of 29 recovering women who provided complete data, the symptoms and stages identified by James were compared to Jellinek's (1952) symptoms. Through descriptive rather than statistical methods, James observed that 8 of the 26 symptoms Jellinek identified occurred at different stages than men in Jellinek's original sample. For example, "pre-drinking, guilt about drinking, memory blackouts, sneak drinks, and gulp drinks occurred in the initial "prodromal" stages of Jellinek's participants whereas they occurred in the middle stage of James' model. Symptoms not identified in Jellinek's model, but which women endorsed in the initial stages included "feels women who drink excessively worse than men, personality change when drinking, drinks more just before menstrual period, feels more intelligent and capable when drinking, and supersensitive" (James, 1975, p. 1568). James concluded that women's stages of alcoholism do not map on to men's stages and that the unique symptoms, particularly of early alcoholism in women, were important to identify for successful clinical intervention. James noted as a limitation that larger samples of women collected beyond the walls of AA were needed to substantiate this finding, thereby setting the stage for subsequent research to expand upon her pioneering preliminary work.

However, a secondary analysis led by Nick Piazza (Piazza, Peterson, Yates, & Sundgren, 1986), who would go on to publish the seminal study on telescoping (Piazza et al., 1989), disputed James' conclusions. Piazza and colleagues assessed 18 symptoms identified in Jellinek's original questionnaire among 41 women recruited from residential alcohol treatment programs and AA and compared symptom progression to that of James' and Jellinek's reports. Piazza found that although James and Jellinek's symptom progression did not significantly correlate, his symptom order correlated with that of both Jellinek and James. Piazza concluded that the symptoms of alcoholism of Jellinek's model are "useful as a description of alcoholism in women *in general*" (Piazza et al., 1986, p. 370). Critically missing from this analysis were the women-specific questions advocated by Jellinek and developed by James.

Building upon the work of Jellinek, the rationale established by the secondary analysis of James' (1975) report, and the momentum of sex difference research more broadly (e.g., Ross, 1989), Piazza is widely credited with defining the term, "telescoping" in 1989 (Piazza et al., 1989). Using landmark symptoms based on the work of Jellinek (1952), 33 women and 105 men recruited from treatment programs and self-help groups completed a questionnaire assessing age of first drink, first drunk experience, first alcohol-related problem, and first treatment admission as well as other drinking symptoms. Piazza published his results in *International Journal of Mental Health and Addiction* showing that although women and men entered treatment at the same age, women reported initiating alcohol use two years later than men and first becoming intoxicated three years later than men. Despite the later onset of alcohol use, the mean interval between first problem and first receiving treatment was 4.3 years shorter for women than men. This indicated that women experience an accelerated progression through the stages of addiction. Furthermore, Piazza reported that

women accumulated the same number of alcohol-related symptoms over a shorter period of time, suggesting that women developed a more severe form of alcoholism than men. Piazza acknowledged that “much of what has been theorized about alcoholism is derived from research on male alcoholics and presumes applicability to alcoholism in women” (Piazza et al., 1989, p. 20). Piazza sought to understand the progression of alcoholism separately in women and asserted the importance of women-specific research in building a foundation for future research. Despite this, Piazza acknowledged that the criteria used to assess alcoholism, landmark symptoms, and progressive disease model of alcoholism were based on research validated in men.

After Piazza defined the term in relation to alcoholism, researchers observed a similar phenomenon with other drugs of abuse as well as addictive behaviors such as gambling (Blanco, Hasin, Petry, Stinson, & Grant, 2006; Grant, Odlaug, & Mooney, 2012; Hernandez-Avila et al., 2004; Khan et al., 2013; Lewis et al., 2014; McCance-Katz, Carroll, & Rounsaville, 1999; Stoltman, Woodcock, Lister, Greenwald, & Lundahl, 2015). For example, Khan and colleagues (2013) observed that the timespan between age of first use and onset of cannabis use disorder was 2.5 years shorter for women than men. In an important departure from previous studies hampered by small samples of women, participants were recruited nationally and included 1,217 women and 3,297 men. However, larger and more diverse samples have also produced discrepant results with fewer telescoping effects observed in certain cohorts (Johnson, Richter, Kleber, McLellan, & Carise, 2005; Keyes, Grant, & Hasin, 2008; Randall et al., 1999; Slutske, Piasecki, Deutsch, Statham, & Martin, 2015; Wagner & Anthony, 2007). For example, Keyes and colleagues examined epidemiological cohort data with men and women born between 1934 and 1983 and concluded that telescoping is not observed in the general population (Keyes, Martins, Blanco, & Hasin, 2010). Instead, the phenomenon of telescoping may only occur in individuals who go on to develop a clinical diagnosis. Changes in telescoping might be attributed to improved specificity in defining subgroups of women including factors such as race, ethnicity, and age (Johnson et al., 2005) as well as changing social norms regarding substance use. The precise mechanism underlying telescoping, however, has not been demonstrated.

Perhaps the greatest legacy of the telescoping research may be in its role in helping to establish a rationale for studying sex and gender differences and providing women-specific treatment. A literature search using Web of Science and PubMed revealed that of the 103 peer-reviewed articles citing Piazza’s original telescoping manuscript, 75 did not directly study telescoping but instead index telescoping to establish a rationale or context for sex and gender differences more broadly. Over the past two decades, fields such as biology, psychology, and behavioral pharmacology have informed potential mechanisms by which sensitivity to drug effects can differ between women and men (Frezza et al., 1990; Greenfield, Back, Lawson, & Brady, 2010; Sofuoglu, Dudish-Poulsen, Nelson, Pentel, & Hatsukami, 1999).

Key differences include hormones, metabolism, and subjective drug effects, may suggest biological mechanisms by which telescoping occurs (Greenfield et al., 2010). Epidemiological studies find that women experience more medical complications of

substance use. For example, women with an alcohol use disorder are more likely to develop liver disease (Becker et al., 1996) and myocardial infarctions (Urbano-Marquez et al., 1995) due to a lower percentage of total body water and slower rates of alcohol metabolism (Frezza et al., 1990). Recent evidence also suggests that alcohol use in females leads to increased brain atrophy (Mann et al., 2005; Sharrett-Field, Butler, Reynolds, Berry, & Prendergast, 2013).

A parallel line of research has examined social and cultural factors that may help to account for the telescoping phenomenon. Several studies have demonstrated that women experience more severe social consequences and disapproval from substance use than men, which may prompt women into treatment more quickly (see Greenfield et al., 2007). Specifically, women's traditional role as mothers may lead family members or authorities to intervene in substance use earlier if they feel children are at risk (Ondersma, Winhusen, & Lewis, 2010), thus bringing women into treatment sooner than men who are comparatively unencumbered by caretaking responsibilities. Partnerships also shape women's substances of choice and patterns of use (Fals-Stewart, Birchler, & O'Farrell, 1999; Simmons, 2006) and have been hypothesized to contribute to telescoping. When women increase drug dosages to mirror their male partners, it may lead to telescoping, especially if they have immediate, adverse reactions to escalating use. Similarly, the loss of a partner who provides economic support and access to illicit substances can precipitate a crisis that leads women to treatment, the last phase in the telescoping trajectory (Cooper et al., 2014). However, a causal relationship between such biological, social, and cultural factors and telescoping has not been demonstrated.

Bias in Telescoping Research

Applied to telescoping research, a feminist philosophy of science framework identifies gender bias in the telescoping framework in at least three ways. First, bias was present in the early conventions that laid the groundwork for telescoping research. The notion that alcoholism is a male disease-- a chronic, progressive condition that inevitably leads to social decline, abusive familial relations, and grotesque death-- was commonly promoted in campaigns for alcohol temperance and prohibition. This progressive disease concept, later subtyped as *gamma* alcoholism, formalized by EM Jellinek and adopted by many other researchers formed the underlying premise of telescoping (Jellinek, 1960). Scholars have argued that the data gleaned from a convenience sample of mostly male, active AA members in the mid-twentieth century should not be assumed to generalize to the wider population of problem or heavy drinkers; generalizing this research to women, then, may be equally problematic (McClellan, 2004; Wilke, 1994). For example, the progressive disease model does not account for either women or men who enter remission without formal intervention. Similarly, those who experience problem drinking but subsequently return to normal drinking are excluded by this model. The telescoping model for women is constrained through selection bias, formalized exclusively among alcoholic men, that alcoholism is progressive, and if left alone, likely fatal.

Second, women were underrepresented and excluded from foundational research that defined telescoping research and women's substance abuse research more broadly. Instead,

symptoms associated with alcoholism were grounded and normalized in experiences of men and validated with methodologies and instrumentation designed for men. Factors that can shape women's substances of choice and patterns of use, such as motherhood and partnerships (Fals-Stewart et al., 1999) were not included in assessments of women's substance use. Even as women-specific interventions were developed, they were still tested with the same methods, instruments, and outcome measures designed for men (Greenfield et al., 2010). This biased methodology in telescoping also limited exploration of the unique features (e.g., precipitants, symptoms, course) of women's substance use. Despite calls for research validated in women (Greenfield & Grella, 2009; Greenfield et al., 2010; Mulford, 1977; Randall et al., 1999), beginning with Piazza's 1989 article, telescoping research compared "landmark symptoms" validated in men, to women. In this way, the course and symptoms of alcoholism were standardized among men. As a result, men served as the reference group from which women were compared. The primary outcome of telescoping research being whether women display the same features of alcoholism observed in men. The language used to describe telescoping research reinforced a discourse of women's divergence or deviance, relative to men. To demonstrate the point, if women served as the reference group, the phenomenon of "magnification", referring to men's relatively prolonged course, may have been coined instead of "telescoping". Feminist philosophy does not advocate for the use of a "feminine" framework over a "masculine" framework. Rather, the exercise highlights the arbitrary nature of the framing effect that can occur when comparing women and men.

Third, sex and gender stereotypes and stigma associated with women's alcohol abuse (Blume, 1986) were perpetuated by gender bias in the interpretation of telescoping results. Types of biased language include accelerated progression, increased sensitivity, greater pathology. For example, Piazza hypothesized that women may experience "a more severe form of alcoholism" (Piazza et al., 1989, p. 26). This biased comparative language reinforced a disempowered narrative and the moralistic undertones of which Linsansky (1958) warned. In addition, gender differences traditionally sought after by telescoping research perpetuate a false dichotomy between women and men and can overlook the intersections of other variables relevant to gender including race, class, sexuality, and age (Miller, 2002). Johnson and colleagues provide evidence for this in a 2005 study demonstrating interactions between age of first regular use of alcohol to intoxication and gender as well as age and race/ethnicity (Johnson et al., 2005).

Taken together, despite evidence of the need to determine the symptoms, course, and treatment of women's alcoholism separately from men (James, 1975; Lisansky, 1958; Piazza et al., 1989), telescoping research perpetuated a "masculine" framework. In a "masculine" framework, male assumptions and biases were embedded in research designs. The results were constrained methodology limiting generative, novel research targeting unique factors associated with substance use among women and biased, loaded comparative language indexed as "telescoping" that perpetuated gender stereotypes. The net effect of gender bias perpetuated through telescoping research was that the priorities of women became a secondary agenda to that of men.

CONCLUSIONS

Feminist Philosophy as a Transformative Framework for Future Directions

Telescoping research contributed to early evidence of critical sex and gender differences helping to usher in the growing field of women's substance abuse research and treatment that was also supported by social movements advocating for civil rights, human rights, women's rights, and women's health specifically (Campbell & Ettorre, 2011, p. 73). Telescoping research provided a rallying cry for women-focused treatment and new insight into treatment and policy interventions that might be effective for women (Hernandez-Avila et al., 2004). Efforts to understand the biological and social mechanisms underlying the telescoping phenomenon also rapidly expanded. The term telescoping transcended the limited and discrepant research studying sex differences in the progression through the stages of substance use disorders and became a narrative used to codify sex and gender differences more generally.

At the same time, telescoping research espoused a theoretical and methodological approach (i.e., "masculine" framework) that, in essence, mandates that women and men be directly compared across a common dimension (or dimensions). Such constraint limited generative, novel research in which features of substance use unique or specific to women could be identified. Contemporary clinical applications were then founded on problematic, gendered assumptions. Furthermore, when applied to women, the underlying progressive disease model of telescoping research subtly reinforced a victim narrative, in which women need to be rescued from the singularly precipitous and inevitable progression of addiction. This discourse may have been counterproductive clinically because it characterized women as deviant and disempowered, when empowerment should be a goal of woman-oriented treatment.

In order to continue to advance the field, the loaded term "telescoping" and the "masculine" framework subsuming such research should be discarded. In its place, a feminist philosophy of science framework can be used to (1) aid in identifying gender bias at all stages of the scientific process and (2) minimize and manage sex and gender bias in substance abuse research. An ever-expanding literature on feminist approaches to social sciences can be a key resource for women's substance abuse researchers and clinicians (see Campbell & Wasco, 2000). For example, one component of a feminist philosophy of science framework is intersectionality (Crenshaw, 1989; Miller & Carbone-Lopez, 2015). Intersectional research begins with the lived experience of substance-using person, as opposed to maleness as the normative standard, and examines social dynamics such as gender, class, and race (Miller & Carbone-Lopez, 2015). Intersectional substance abuse research can uncover unique and distinct features of women's substance abuse. From this framework, a research agenda can be built by a multidisciplinary team that can aid in representing the diverse realities of substance-using women that may be "invisible or opaque to members of dominant groups" (Campbell, 2015, p. 806). Collaborators may include diverse academic representation as well as representation from the community and those individuals for whom the research is targeted. In doing so, the assessment tools and treatment interventions can be designed for specific groups. Researchers and clinicians should not assume that there are

essential sex or gender differences, but instead examine ways in which substance use is shaped by sex and gender, as well as other relevant variables such as race, age, education, and culture (Crenshaw, 1991; Hankivsky & Cromier, 2008; Miller & Carbone-Lopez, 2015). Contemporary clinical applications of a feminist framework have helped to integrate trauma-focused therapy into substance abuse treatment, holistic care integrating services such as medical care and social work into substance abuse treatment, and address the integral role of relationships into substance use interventions.

The application of a feminist framework provides a transformative, productive approach from which to address the long-held bias underlying the telescoping framework and help produce women-specific research and treatment interventions. DeBruin suggests that the goal of women's research should not simply be to increase the number of women included in studies (i.e., add women and stir approach), but rather to evaluate under what contexts sex and gender are relevant to the intervention in question (DeBruin, 1999). Such evaluation requires that experiments be designed from the outset to assess for sex and gender differences rather than conducted as *post hoc* exploratory analyses of sex or gender that lack the statistical power or experimental control to draw meaningful conclusions. Likewise, for clinicians a feminist framework can aid in exploring the dynamic role of sex and gender in women's substance use and recovery. Importantly, when group differences are identified, bias in language can be minimized through the use of descriptive rather than comparative language. Revising a framework established by telescoping research and underlying substance abuse more broadly will ultimately require both restructuring of the enterprise of scientific research and rewriting the traditional cultural scripts used to interpret it.

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Figure 1.

Gender differences in the average age of onset over time for four landmark symptoms.

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