Alcohol and Alcoholism Vol. 46, No. 2, pp. 95–104, 2011
Advance Access Publication 14 January 2011
doi: 10.1093/alcalc/agq093

REVIEW

What Can Alcohol Researchers Learn from Research about the Relationship Between Macro-Level Gender Equality and Violence against Women?

Sarah C.M. Roberts [1,2,*]

[1]Alcohol Research Group, 6475 Christie Ave, Suite 400, Emeryville, CA 94608, USA and [2]University of California, Berkeley School of Public Health, Berkeley, CA 94720, USA

*Corresponding author: Tel.: +1-510-597-3440; Fax: +1-510-985-6459; E-mail: sroberts@arg.org

(*Received* 30 *July* 2010; *in revised form* 6 *December* 2010; *accepted* 7 *December* 2010)

Abstract — Aims: This systematic review focuses on research about macro-level gender equality and violence against women (VAW) and identifies conceptually and theoretically driven hypotheses as well as lessons relevant for alcohol research. Hypotheses include: amelioration—increased equality decreases VAW; backlash—increased equality increases VAW; and convergence—increased equality reduces the gender gap; and hypotheses that distinguish between relative and absolute status, with relative status comparing men's and women's status and absolute status measuring women's status without regard to men. **Methods:** Systematic review of studies published through June 2009 identified through PubMed and Web of Science, as well as citing and cited articles. **Results:** A total of 30 studies are included. Of 85 findings examining amelioration/backlash, 25% support amelioration, 22% backlash; and 53% are null. Of 13 findings examining convergence, 31% support and 23% are inconsistent with convergence; 46% are null. **Conclusion:** Neither the existence nor the direction of the equality and VAW relationship can be assumed. This suggests that the relationship between macro-level gender equality and alcohol should also not be assumed, but rather investigated through research.

INTRODUCTION

With the goal of identifying lessons for research about macro-level gender equality and alcohol, this systematic review examines research about macro-level gender equality and violence against women (VAW). Using these lessons to inform high-quality research related to macro-level gender equality and alcohol is important because recent public discussions of women's drinking have described increases in women's risky drinking and have blamed these increases on feminism and increased gender equality (Clark-Flory, 2008; Morris, 2008; Riddoch, 2009). Evidence is mixed about whether there has been an increase in women's risky drinking or a convergence in women's and men's drinking and alcohol-related consequences (see Bergdahl, 1999; Bloomfield *et al*., 2001; Grucza *et al*., 2008; Keyes *et al*., 2008; McPherson *et al*., 2004; Neve *et al*., 1993, 1996; Saelan *et al*., 1992; Simpura and Karlsson, 2001; Wilsnack and Wilsnack, 2002; Wilsnack *et al*., 2006). But, to the extent that there has been such an increase or a convergence, it is unclear if increased gender equality or improved women's status at the macro-level (i.e. country, state, county or city level) has contributed to any of these changes.

Very limited research has explored the relationship between gender equality and women's (or men's) alcohol consumption and consequences. Research at the individual level examining the relationship between men's and women's social roles and alcohol has found mixed results (Gmel *et al*., 2000; Kuntsche *et al*., 2009; Mansdotter *et al*., 2008; Murphy *et al*., 2000). Consideration of men's and women's social roles is one possible way of operationalizing gender equality at an individual level. Less research has explored the relationship of macro-level gender equality and alcohol use and consequences. Two recent multi-country studies are notable exceptions (Bond *et al*., 2010; Rahav *et al*., 2006). One study examined the association between macro-level gender equality and current drinking, weekly drinking, heavy drinking, heavy episodic drinking, alcohol dependence, total alcohol-related deaths, deaths due to cirrhosis, deaths due to motor vehicle crashes and alcohol-related physical aggression by a spouse or partner (Rahav *et al*., 2006). This study included 23 developed and developing countries from five continents. This study found that increased macro-level gender equality was associated with smaller gender ratios in current and weekly drinking as well as each alcohol-related consequence. However, in some cases, the association was no longer significant after controlling for gross domestic product (GDP). The study also found that, with the exception of alcohol dependence and alcohol-related physical aggression, increased gender equality was associated with decreases in consequences for both men and women. Another study examined the association between macro-level gender equality and gender differences in the frequency of drinking in public and private settings in 22 developed and developing countries in six continents (Bond *et al*., 2010). This study found that increased gender equality was associated with smaller gender differences in the frequency of drinking in public, but not private, settings and that, after controlling for GDP, gender equality in economic participation was the only equality indicator that predicted size of this gender difference. These two studies generally reported findings in the direction predicted by the recent claims, i.e. that increased gender equality predicted smaller gender differences. It is important to note that this varied depending on the gender equality indicator and the specific alcohol measure.

The Rahav *et al*. (2006) study provides an important first step, identifying possible existing country-level indicators of gender equality/women's status that may be relevant for alcohol research. They used an existing measure, the Gender Empowerment Measure (GEM; United Nations Development Programme, 2009), and created an additional single composite index based on numerous potential indicators of gender equality/women's status. Their single composite index

included the ratio of women and men in the labour force, the proportion of women in management positions, the proportion of women in parliament and higher education, the difference between men's and women's earnings as well as indicators of beliefs regarding women's status and gender roles from the World Values Survey. However, they did not specify the theoretical relevance of the selected indicators. Bond *et al*. (2010) included six country-level equality indicators: the Gender Gap Index (GGI) subindices for economic participation, education and political participation (Hausmann *et al*., 2007); the GEM; context of VAW; and reproductive autonomy. The first four are existing indices. Bond *et al*. (2010) presented a theoretical rationale for including economic participation and context of VAW as the gender equality/women's status indicators likely to predict gender differences in drinking in public settings.

In addition to these two studies, there is a larger body of research from which alcohol researchers can draw lessons. One example is the theoretically driven research exploring the relationship between gender equality and VAW. This broad body of research is not specific to alcohol. With the goal of identifying lessons for and conceptual frameworks to guide research relating to macro-level gender equality and alcohol, this paper reviews literature relating to macro-level gender equality and VAW. Reviewing the macro-level gender equality and VAW literature makes sense because the body of research is conceptually driven and because there are strong folk beliefs regarding relationships between macro-level gender equality and both VAW and alcohol. Further, VAW and alcohol may share certain attributes, such as associations with impulsivity/risk taking (Cherpitel, 1999; Schafer *et al*., 2004); and share certain patterns, i.e. with women tending to be the victims in the violence and tending to drink less than men (Basile *et al*., 2007; Wilsnack *et al*., 2000). Also, there may be relationships between VAW and alcohol. Alcohol may exacerbate VAW (Abbey *et al*., 2009) and violence in general is a component of alcohol-related problems (Midanik and Clark, 1995). This means that findings from research relating to macro-level gender equality and VAW may have direct implications for research relating to gender equality and alcohol. Finally, both VAW and alcohol consumption involve interactions between men and women, whether the actual violent event or the likely mutual influence of male on female and female on male drinking patterns. These interactions could plausibly be influenced by gender equality.

Three conceptually driven hypotheses drive the macro-level gender equality and VAW research. These hypotheses include: amelioration, backlash and convergence (see, for example, (Brewer and Smith, 1995; Eschholz and Vieraitis, 2004; Martin *et al*., 2006; Pampel, 2001; Whaley and Messner, 2002). Amelioration suggests that increases in gender equality will decrease VAW. Backlash suggests increases in equality will increase VAW, at least in the short term, and then may decrease it over time. Convergence does not focus on whether increases in equality leads to increases or decreases in VAW, but rather suggests that increased equality/status will lead men and women to become more similar in experiencing (and perpetrating) violence. An example of convergence would be domestic/partner violence perpetrated by women against men becoming similar to rates perpetrated by men against women. These hypotheses predict differences in how increases in equality might affect VAW.

The research about the relationship between gender equality and VAW generally includes similar equality measures to those in the limited alcohol research. Importantly, the VAW research also distinguishes measures of gender equality from measures of women's status and suggests that this distinction is conceptually important. A measure of gender equality might compare the proportion of women to men completing secondary education, while a measure of women's status would look only at the proportion of women completing secondary education. While potentially highly correlated, an equality measure could plausibly look very different from a women's status measure. For example, in country A and country B, 40% of women complete secondary education (an indicator of women's status). In country A, 80% of men complete secondary education, while in country B, 40% of men complete. Country A's gender equality measure (2:1) would look very different from country B's measure (1:1). Vieraitis *et al*. (2007) explain that the gender equality hypothesis is associated with liberal/radical feminist theory and that it suggests that inequality between men and women puts women at a structural disadvantage to men, who then use violence to keep them in their place. Vieraitis *et al*. explain that the women's status hypothesis is associated with socialist and Marxist feminist theory. This theory suggests that women in lower/working classes have fewer economic resources to keep themselves out of harm's way, specifically from men who are frustrated with their disadvantaged life and economic situations and therefore take their frustrations out on the women in close proximity. When women have more resources, they can more easily extract themselves from these higher crime contexts. To operationalize these distinctions, researchers use relative measures—such as the ratio of employed men to employed women—as indicators of gender equality and absolute measures—such as percentage of all women who are employed—as indicators of women's status. For the remainder of the paper, gender equality will be used to refer to relative measures as well as generically while women's status will be used to refer to absolute measures.

The body of research exploring the relationship between macro-level gender equality and VAW is conceptually rich and broader than the limited macro-level equality and alcohol research currently available. However, from a quick glance at the VAW literature, it is difficult to determine which theories the evidence supports and therefore which theories may be important for alcohol researchers to consider. Thus, a systematic review of this literature that both quantitatively and qualitatively assesses support for the amelioration/backlash/convergence as well as relative vs. absolute status theories as well as examines methods that researchers have used to test these theories is warranted. Such a review can also identify lessons for alcohol researchers interested in gender equality and alcohol use and consequences.

METHODS

This review includes studies of macro-level gender equality and VAW published through June 2009 in English and Spanish, peer-reviewed journals or books. English and

Spanish studies were included because of the author's ability to understand these languages. Only one Spanish study met inclusion criteria. Two electronic databases were searched to identify eligible studies: PubMed and Web of Science. All studies that included measures of macro-level gender equality or women's status for multiple countries, states, counties or cities and a VAW outcome were targeted for inclusion. The keywords used were 'gender equity', 'gender equality', 'patriarchy', 'women's status', combined with 'multi-level', 'ecologic' and 'cross-national', as well as 'Gender Empowerment Measure (GEM)', 'Gender Development Index (GDI)' and 'Gender Gap Index (GGI)', the latter three of which are existing country-level measures of gender equality (Hausmann *et al*., 2007; United Nations Development Programme, 2009). There were no restrictions on the publication date. The resulting citations were manually searched for studies that included macro-level measures of gender equality/women's status, measured by composite or single-domain indicators. Such single-domain indicators included gender equality in education, economic participation and political participation and well as reproductive rights and patriarchy. In addition to the keyword searches, the reference sections of identified papers were searched to find additional studies and Web of Science, Google Scholar and Scopus were also used to find additional studies that had cited other identified studies.

Inclusion/exclusion criteria

Thirty studies met the inclusion criteria. Studies with macro-level data from multiple countries, multiple states, multiple provinces or counties, multiple regions or multiple cities were included. Both multi-level and ecologic studies were included. Individual-level studies (e.g. (Avakame, 1999), articles presenting data without reporting the direction of effects (Butchart and Engstrom, 2002) and articles presenting interaction findings as separate papers to previously published papers reporting main effects that are already included in this review (Linsky *et al*., 1995; Yllo, 1984) were excluded. Only articles with a direct outcome of VAW (i.e. homicide, domestic/partner violence and rape/sexual assault) or gender ratio/gap in this type of violence were included. Articles that focused on violence against men only were not included as the theories explored in the literature relating to VAW were not developed in relation to male violence against men. Closely related violence outcomes that were not explicitly VAW, such as suicide (e.g. (Kawachi *et al*., 1999; Lester, 1994, 1996; Mayer, 2000), fear of going outside after dark (Yodanis, 2004), acceptability of domestic violence (Gracia and Herrero, 2006) and mortality due to injury and poisoning and to accidents (Pampel, 2001; Stanistreet *et al*., 2007), were excluded. Exclusion of these closely related violence outcomes eliminated 53 findings from nine separate papers.

Coding

Study outcomes were classified into homicide, partner/domestic violence and rape/sexual assault. Homicide includes homicides due to partner/domestic violence. Partner/domestic violence includes both sexual and physical violence by partner. Gender equality/women's status indicators were classified into six categories of predictors: political participation, education, employment and earnings, reproductive rights, patriarchy and gender equality/women's status composite indices. Education includes the 'Social and economic autonomy' index used by Kawachi *et al*. (1999), although this index includes factors other than education. Reproductive rights includes such variables as abortion availability (Kawachi *et al*., 1999). Patriarchy includes indicators of legal inequality such as sex discrimination laws or community gender norms, such as the extent to which people believe a wife should always follow instructions of her husband (Koenig *et al*., 2006; Whaley, 2001). The composite indices include indices either developed specifically for the study or existing indices such as the GDI. Composite indices developed specifically for the studies include indicators from the single domains listed as well as other assessments of gendered capabilities, such as gender ratios in literacy, and laws, such as equal pay laws. While GDI is not a measure of gender equality per se (United Nations Development Programme, 2009), it is included with the composite indices because it is often used as an indicator of gender equality (e.g. (Torsheim *et al*., 2006; Vives-Cases *et al*., 2007). Each of the indicators of gender equality/women's status was coded exclusively as either relative, absolute, mixed relative and absolute or rights/culture indicator. Studies were also classified by the site of study; whether the population for the outcome was female, male, both female and male or a gender ratio/gap; and whether the analysis was ecological or multi-level, cross-sectional or lagged (which has been used to test backlash); and whether it included control variables.

Each study was allowed to contribute multiple findings. A finding was defined as either a bivariate or multivariate test of an equality/status predictor and violence outcome. If the predictor was included in multivariate and bivariate analysis, only the finding from the multivariate model was coded and included. Each finding was first classified as significant or null, using the significance level defined/reported in the study. When more than one single-item predictor from the same larger category of gender equality/women's status predictor was included, the category was coded as significant if one or more of the single-item predictors in that larger category were found significant. Each significant finding was then classified as positive or negative. For studies with a female, male or combined female and male outcome, positive findings were those in which increased gender equality/women's status predicted a decrease in violence (amelioration); and negative findings were those in which increased equality/status predicted an increase in violence (backlash). Curvilinear findings, such as in Yllo (Yllo, 1983), in which violence was highest in places with both the least and the most equality/women's status were coded as null for purposes of the statistical analysis. For findings with a gender ratio/gap as the outcome, positive findings mean that as equality/status increases, the gender ratio decreases (convergence). When more than one single-item predictor from the same larger category of equality/status predictor was included, the category was coded as positive or negative depending on the direction of the majority (>50%) of the significant findings.

Analysis

Findings rather than study were taken as the unit of analysis. One hundred and two findings were included in the analysis.

Reproductive rights and patriarchy were combined for analyses as were mixed relative/absolute and rights indicators. χ^2tests were used to examine whether patterns of findings differed based on predictor, study design, analysis or outcome characteristics. Fisher's exact tests were used when cell sizes were smaller than five. Additionally, because of the small sample size, a qualitative review of the studies that explicitly tested conceptually or theoretically driven hypotheses by including both relative and absolute measures of the same indicators and by conducting both cross-sectional and lagged analysis was also conducted.

RESULTS

Focus of studies

More than half (16/30) of the studies included homicide as an outcome, about one-third included rape/sexual assault (9/30) and six included intimate partner violence (see Table 1). One study (Vives-Cases *et al*., 2007) included both partner homicides and partner violence reports, which is the reason the total adds up to 31. More than two-thirds (21/30) of the studies included gender equality in employment and earnings; more than half (16/30) included in education; about one-third (9/30) included composite indices; about one-third (9/30) included measures of patriarchy; 20% (6/30) used measures of political participation; and one study included a measure of reproductive rights. Of those with employment and earnings as the measure of gender equality, 10-used relative measures only (i.e. focused only on gender equality), three-used absolute measures only (i.e. focused on women's status only), five-used distinct measures of both relative and of absolute status and three-used mixed relative/absolute measures. Of those with education as the measure, eight-used relative measures only, two-used absolute measures only, four-used distinct measures of both relative and of absolute status, and two-used a mixed relative/absolute measure.

Most of the studies were ecologic (27); a few (Ackerson and Subramanian, 2008; Koenig *et al*., 2003, 2006) used multi-level analysis (3). All were cross-sectional; two (Gartner *et al*., 1990; Whaley, 2001) also used both cross-sectional and lagged analyses to explicitly test the complete backlash hypothesis. Most of the studies focused on female outcomes (21); a few focused on both male and female outcomes (5) and a few included only a gender gap or ratio or a gender gap/ratio as well as either female or female and male (4) as outcomes. Two-thirds (20/30) of the studies were conducted in the USA across either states or metropolitan statistical areas, six were conducted across multiple developed and developing countries and four were conducted within single countries (not the USA), including Bangladesh, India and Spain.

Pattern of findings

More than half of the findings (53%, or 54/102) were null (or non-significant; see Table 2). Of those that were significant, a little more than half (52%, or 25/48) supported amelioration/convergence and a little less than half (48%, or 23/48) supported backlash/were against convergence (see Table 2). Similar patterns exist when findings related to VAW and both men and women are distinguished from findings related to a gender ratio/gap in experiencing violence.

Table 3 presents findings from bivariate analyses that sought to determine whether outcome characteristics, gender equality measure characteristics or study characteristics predicted significance and direction of findings. In bivariate analyses, specific outcome (i.e. homicide, domestic violence and rape/sexual assault), cross-sectional vs. lagged, equality indicator ($P < 0.10$) and outcome gender ($P < 0.05$) predicted whether the findings were significant. Cross-sectional vs. lagged, equality indicator ($P < 0.10$) and study location ($P < 0.05$) predicted whether significant findings supported amelioration vs. backlash or convergence (see Table 3).

Studies testing conceptually and theoretically driven hypotheses

Some of the included studies explicitly tested theory by including distinct measures of both relative and absolute measures in their study; by conducting both cross-sectional and lagged analysis; and by not assuming linearity. Seven studies (Bailey, 1999; Bailey and Peterson, 1995; Eschholz and Vieraitis, 2004; Gauthier and Bankston, 1997; Martin *et al*., 2006; Vieraitis and Williams, 2002; Vieraitis *et al*., 2007) included both relative and absolute measures of the same domain of equality (i.e. education, employment and earnings and women's status composite index; see Table 1). In five of these studies (Bailey, 1999; Eschholz and Vieraitis, 2004; Gauthier and Bankston, 1997; Martin *et al*., 2006; Vieraitis *et al*., 2007), significance and/or direction of findings differed depending on whether the indicator was relative or absolute. There was no consistent pattern regarding which was the better predictor. In the two studies that did not fit this pattern, findings in one (Bailey and Peterson, 1995) were all null; and findings in the other (Vieraitis and Williams, 2002) varied across the domain of equality, but did not vary within the domain by whether the measure was absolute or relative.

Two studies included both cross-sectional and lagged analysis to test the complete backlash hypothesis, where increased equality/status leads violence to increase in the short term and then decrease over time (Gartner *et al*., 1990; Whaley, 2001). Gartner *et al*. (1990) found similar findings for both their cross-sectional and lagged analyses for education and patriarchy as predictors (negative and positive, respectively) of the gender gap in homicide. However, gender equality in employment and earnings was a significant predictor (positive) in the cross-sectional analysis only. On the other hand, Whaley (2001) found that education, employment and earnings and patriarchy were negatively associated with rape in the cross-sectional analysis, but positively associated with rape in the lagged analysis. A third study also tested the complete backlash hypothesis by allowing for a non-linear outcome (Yllo, 1983). This study found that partner violence (by husbands against wives) was higher in states with both low levels of equality and high levels of equality than in states with middle levels of equality.

DISCUSSION

Findings from this review suggest that neither the existence of nor the direction of relationships between gender equality

Table 1. Included studies

Author	Study characteristics	Measure of gender equality/ women's status	Outcome characteristics	Significance and direction of findings
Ackerson and Subramanian (2008)	Multi-level, India-based, macro-level control variables, 26 states	Women's status composite (rel)	Domestic violence lifetime	Null
		Women's status composite (rel)	Domestic violence recent	Positive
Austin and Kim (2000)	Ecologic, multi-country macro-level control variables, 89 countries	Political participation (rel)	Rape rates	Null
		Education (rel)		Null
		Employment and earnings (rel)		Negative
		Women's status composite (rel)		Negative
Bailey and Peterson (1995)	Ecologic, US-based, macro-level control variables, 138 cities	Education (rel)	Homicide of women	Null
		Employment and earnings (rel)		Null
		Education (abs)		Null
		Employment and earnings (abs)		Null
Bailey (1999)	Ecologic, US-based, macro-level control variables, 192 cities	Education (rel)	Rape (1990)	Negative
		Employment and earnings (rel)		Null
		Education (rel)	Rape (1980)	Null
		Employment and earnings (rel)		Negative
		Education (abs)	Rape (1990)	Null
		Employment and earnings (abs)		Positive
		Education (abs)	Rape (1980)	Null
		Employment and earnings (abs)		Positive
		Education (rel)	Rape (change 1980–1990)	Null
		Employment and earnings (rel)		Positive
Baron and Straus (1984)	Ecologic, US-based, macro-level control variables, 51 states	Women's status composite index (mixed)	Rape (both male and female)	Negative
Baron and Straus (1987)	Ecologic, US-based, macro-level control variables, 50 states	Women's status composite index (mixed)	Rape (both male and female)	Positive
Brewer and Smith (1995)	Ecologic, US-based, macro-level control variables, 177 cities	Education (rel)	Homicide	Null
		Employment and earnings (rel)		Null
DeWees and Parker (2003)	Ecologic, US-based, macro-level control variables, 165 cities	Political participation (abs)	Homicide	Null
		Education (rel)		Negative
		Employment and earnings (rel)		Negative
		Patriarchy (rel)		Null
Ellis and Beattie (1983)	Ecologic, US-based, macro-level control variables, 25 cities	Education (rel)	Rape	Null
		Employment and earnings (rel)		Null
Eschholz and Vieraitis (2004)	Ecologic, US-based, macro-level control variables, 148 cities	Education (rel)	Rape	Null
		Employment and earnings (rel)		Negative
		Education (abs)		Negative
		Employment and earnings (abs)		Null
Gartner (1990)	Ecologic, multi-country, macro-level control variables, 18 countries	Employment and earnings (abs)	Homicide (male)	Null
			Homicide	Negative
			Homicide—children (both male and female)	Negative
Gartner *et al*. (1990)	Ecologic, multi-country, 18 countries	Education (rel)	Homicide—cross-sectional (gender ratio/gap)	Negative
		Employment and earnings (rel)		Positive
		Patriarchy (mixed)		Positive
		Education (rel)	Homicide—lagged (gender ratio/ gap)	Negative
		Employment and earnings (rel)		Null
		Patriarchy (mixed)		Positive
Gauthier and Bankston (1997)	Ecologic, US-based, macro-level control variables, 191 cities	Employment and earnings (rel)	Intimate homicides (gender ratio/ gap)	Positive
		Employment and earnings (abs)		Null
Kawachi *et al*. (1999)	Ecologic, US-based, macro-level control variables, 50 states	Political participation (abs)	Homicide	Null
		Education (abs)		Positive
		Employment and earnings (mixed)		Null
		Reproductive rights (mixed)		Null
Koenig *et al*. (2003)	Multi-level, Bangladesh-based, 179 neighbourhoods	Education (abs)	Domestic violence	Null

Continued

Table 1. *Continued*

Author	Study characteristics	Measure of gender equality/ women's status	Outcome characteristics	Significance and direction of findings
		Employment and earnings (abs)		Positive
		Patriarchy (abs)		Positive
Koenig *et al*. (2006)	Multi-level, India-based, macro-level control variables, 92 communities	Patriarchy (abs)	Domestic violence (physical)	Positive
			Domestic violence (sexual)	Null
Lester (1996)	Ecologic, multi-country, (homicide male and gender ratio used macro-level control variables), 50 countries	Women's status composite index (mixed)	Homicide (male)	Null
		Employment and earnings (mixed)		Null
		Women's status composite index (mixed)	Homicide	Null
		Employment and earnings (mixed)		Null
		Women's status composite index (mixed)	Homicide (both male and female)	Null
		Employment and earnings (mixed)		Null
		Women's status composite index (mixed)	Homicide (gender ratio/gap)	Negative
		Employment and earnings (mixed)		Null
Martin *et al*. (2006)	Ecologic, US-based, macro-level control variables, 228 cities	Women's status composite index (rel)	Rape	Negative
		Women's status composite index (abs)		Positive
Palma-Solis *et al*. (2008)	Ecologic, multi-country, macro-level control variables, 61 countries	Political participation (rel)	Homicide	Positive
		Education (mixed)		Null
		Employment and earnings (abs)		Null
Peterson and Bailey (1992)	Ecologic, US-based, macro-level control variables, 263 metropolitan areas	Education (rel)	Rape	Null
		Employment and earnings (rel)		Null
Pridemore and Freilich (2005)	Ecologic, US-based, macro-level control variables, 50 states	Employment and earnings (rel)	Homicide	Null
		Patriarchy (mixed)		Null
Smith and Brewer (1995)	Ecologic, US-based, macro-level control variables, 176 cities	Education (mixed)	Homicides (gender ratio/gap)	Null
		Employment and earnings (mixed)		Null
		Patriarchy (mixed)		Null
Stout (1992)	Ecologic, US-based, 50 states	Employment and earnings (rel)	Intimate femicide	Negative
		Political participation (rel)		Positive
		Patriarchy (mixed)		Positive
Vieraitis and Williams (2002)	Ecologic, US-based, macro-level control variables, 158 cities	Education (abs)	Homicide	Null
		Employment and earnings (abs)		Negative
		Education (rel)		Null
		Employment and earnings (rel)		Negative
Vieraitis *et al*. (2007)	Ecologic, US-based, macro-level control variables, 3083 counties	Patriarchy (mixed)	Homicide	Null
		Women's status composite index (abs)		Positive
		Women's status composite index (rel)		Null
Vives-Cases *et al*. (2007)	Ecologic, Spain-based, 49 provinces	GDI (mixed)	Domestic violence deaths	Positive
		GDI (mixed)	Domestic violence reports	Positive
Whaley and Messner (2002)	Ecologic, US-based, macro-level control variables, 193 cities	Women's status composite index (rel)	Homicide by men	Negative
		Women's status composite index (rel)	Homicide by women	Null
Whaley (2001)	Ecologic, US-based, macro-level control variables, 109 cities	Education (rel)	Rape—cross-sectional (both male and female)	Negative
		Employment and earnings (rel)		Negative
		Patriarchy (mixed)		Negative

Continued

Table 1. *Continued*

Author	Study characteristics	Measure of gender equality/ women's status	Outcome characteristics	Significance and direction of findings
		Education (rel)	Rape—lagged (both male and female)	Positive
		Employment and earnings (rel)		Positive
		Patriarchy (mixed)		Positive
Yllo (1983)	Ecologic, US-based, macro-level control variables, 30 states	Women's status composite index (mixed)	Violence against husbands (male)	Negative
		Women's status composite index (mixed)	Violence against wives	Curvilinear
Yodanis (2004)	Ecologic, multi-country, macro-level control variables, 27 countries	Political participation (rel)	Physical violence	Null
		Education (rel)		Null
		Employment and earnings (rel)		Null
		Political participation (rel)	Sexual violence	Null
		Education (rel)		Positive
		Employment and earnings (rel)		Positive

Table 2. Overall significance and direction of findings

	Null *n* (%)	Backlash/against convergence *n* (%)	Amelioration/convergence *n* (%)
Violence against women (or against both women and men)	45 (52.9)	19 (22.4)	21 (24.7)
Gender ratio/gap in experiences of violence	6 (46.2)	3 (23.1)	4 (30.8)
Total outcomes (includes outcomes of violence against men only)	54 (52.9)	23 (22.6)	25 (24.51)

Table 3. Significance and direction of findings by outcome, study and equality indicator characteristics

	Null (*n*)	Backlash/ against convergence (*n*)	Amelioration/ convergence (*n*)	Total (*n*)
Specific violence outcome				
Homicide (comparison group)	33	11	10	54
Domestic violence	6	1	5	12
Rape/sexual assault	15^{+}	11	10	36
Absolute vs. relative				
Absolute (comparison group)	13	4	8	25
Relative	25	15	10	50
Mixed absolute and relative/other	16	4	7	27
Cross-sectional vs. lagged				
Cross-sectional (comparison group)	53	22	21	96
Lagged	1^{+}	1	4^{+}	6
Gender equality/women's status measure				
Education (comparison group)	17	6	3	26
Political participation	5	0	2	7
Employment and earnings	19	10	8	37
Patriarchy/reproductive rights	6	1	6^{+}	13
Women's status index/GDI	7^{+}	6	6	19
Location				
USA (comparison group)	34	16	13	63
Single country non-USA	3	0	6*	19
Multi-country	17	7	6	30
Outcome gender				
Female (comparison group)	43	14	17	74
Male	3	1	0	4
Both	2*	5	4	11
Gender ratio/difference	6	3	4	13

$^{+}P < 0.10$, $^{*}P < 0.05$, compared with comparison group in the category.

and VAW can be assumed. In relation to alcohol, these findings suggest that the relationship between macro-level gender equality and alcohol should not be assumed, but rather tested through research. This review identified both some content-related factors that may influence these relationships as well as study design characteristics that may influence significance and direction of study findings. Composite indices of equality may be more likely than measures of education to predict VAW, but the direction of the relationships is not yet clear. While not significant in the bivariate analyses, the qualitative review of studies that included distinct measures of both gender equality and women's status in the same study

suggests whether predictors measure gender equality or women's status matters. Therefore, the choice of whether to use an absolute (measure of status) or relative (measure of equality) indicator may influence findings. Finally, bivariate analyses suggest that findings may vary depending on characteristics of the outcome, including the specific type of violence.

These findings may have direct implications for alcohol research. For example, increased gender equality could lead women to drink more frequently in public settings, a possibility based on the Bond *et al.* (2010) study. The backlash hypothesis suggests this increase in drinking in public (which may violate existing gender norms as well as create additional opportunities for exposure to violence) could lead to an increase in VAW in the short term and then, possibly, decrease in the long term. Some research supports the first component of this backlash hypothesis, suggesting that increased frequency of drinking in bars is associated with increased risk of sexual assault (Ullman, 2003). This expected relationship could be complicated if the backlash of violence then leads to either increases in or decreases in women's alcohol use. Increases are plausible if women, who experience violence, use alcohol as a coping strategy (Ullman, 2003). Decreases are plausible if women forgo drinking, especially in bars, as a strategy to avoid violence. On the other hand, gender equality could either confound the male alcohol and male violence perpetration relationship (see, for example, Powell *et al.*, 2010) or mediate the gender equality violence relationship, with low levels of gender equality causing men to drink in risky patterns to prove masculinity and possibly also perpetrate violence. However, if increased gender equality does not reduce VAW, these hypothesized relationships are not plausible.

Beyond these direct implications for research into gender equality, violence and alcohol, this review may offer some lessons for alcohol researchers examining the relationship between macro-level gender equality and alcohol. First, distinguish indicators of gender equality from indicators of women's status. Researchers should either have a theoretical rationale for choosing one or the other or include both as distinct measures, especially from the same domain (such as both economic equality and women's economic status). Second, develop and test conceptually and theoretically driven hypotheses about the expected relationships between different indicators of gender equality and different alcohol measures. The three main hypotheses—amelioration, backlash and convergence—may have analogies in alcohol research. For example, increases in women's economic participation could lead to women having more control over resources, which they may decide to spend on alcohol, or to women adopting similar behaviours to men, such as drinking after work (backlash and convergence). More women in the workplace could change workplace cultures that involve regular alcohol consumption and thereby decrease men's drinking (leading to convergence). Conversely, women participating in the workplace cultures that involve regular alcohol consumption could increase women's alcohol consumption and, as feared by temperance activists (Eriksen, 1999), decrease their 'nagging' of men about their alcohol use, which could result in both women and men drinking more (backlash, maybe convergence). Additionally, women's increased economic participation could lead to women being more fulfilled by having multiple roles (Mansdotter *et al.*, 2008) and therefore to women drinking less often to cope with stress (amelioration). However, if systems to support women's increased economic participation do not exist, as may happen in early stages of gender equality (Chafetz, 1990), such increases could lead women to drink more heavily to cope with stress and then, over time as systems develop, reduce their drinking to levels lower than where they started (complete backlash). Third, use study designs and analysis methods that allow for explicit testing of these hypotheses. For example, test the complete backlash hypothesis by using both cross-sectional and lagged data and allow for non-linear relationships.

This study should be considered in light of its limitations. First, the sample size of findings is small, which limits the power to detect effects and makes multivariate analyses untenable. Second, some study characteristics such as gender equality indicator and study location may be correlated. Given that the small sample size makes multivariate analyses untenable, it is not possible to determine whether, for example, study location confounds the gender equality and VAW association. Third, the bivariate findings include 28 statistical tests. The choice to use *P*-values of 0.10 and 0.05 capitalizes on chance, and thus should be interpreted with caution. A conservative interpretation of these findings is that none are statistically significant. However, as this is the first systematic study of this entire body of literature, statistical significance levels are reported so that the reader can draw his or her own conclusions. Fourth, the decision to classify a finding as significant if one or more of the indicators of that domain in the study was significant may capitalize on chance and thus may count too many findings as significant. Fifth, the lack of significant findings in some of the reviewed papers may be due to lack of power to detect small effects and to small samples of macro-level units. Sixth, many of the studies also reported interactions and findings from stratified analyses. By not including findings from these analyses, this review excludes addressing the implications of such findings.

This study also has strengths. To the author's knowledge, this is the first study in the alcohol literature to review existing research about the relationship between macro-level gender equality and health and discuss the implications for alcohol research. Future alcohol studies that incorporate lessons from this review will have the opportunity to determine which, if any, aspects of macro-level gender equality influence alcohol use and problems and for whom. Depending on the significance and direction of the findings, the findings from this research can be used to either counter false claims that impugn gender equality or to develop appropriate interventions to reduce consequences of increased alcohol use for women's health and well being.

Acknowledgments — This paper was originally presented at the Kettil Bruun Society Alcohol and Violence Thematic Meeting in Melbourne, Australia in March 2010. Thomas K. Greenfield and Ross Homel provided helpful feedback on this paper.

Funding — This project was supported by National Institute for Alcohol Abuse and Alcoholism Graduate Training on Alcohol Problems (T32 AA07240).

REFERENCES

Abbey A, Parkhill MR, Jacques-Tiura AJ *et al.* (2009) Alcohol's role in men's use of coercion to obtain unprotected sex. *Subst Use Misuse* **44**:1329–48.

Ackerson LK, Subramanian SV. (2008) State gender inequality, socioeconomic status and intimate partner violence (IPV) in India: a multilevel analysis. *Aust J Soc Issues* **43**:81–102.
Austin RL, Kim YS. (2000) A cross-national examination of the relationship between gender equality and official rape rates. *Int J Offender Ther Comp Criminol* **44**:204–21.
Avakame EF. (1999) Females' labor force participation and intimate femicide: an empirical assessment of the backlash hypothesis. *Violence Vict* **14**:277–91.
Bailey WC. (1999) The socioeconomic status of women and patterns of forcible rape for major US cities. *Sociol Focus* **32**:43–63.
Bailey WC, Peterson RD. (1995) Gender inequality and violence against women: the case of murder. In Hagan J, Peterson RD (eds). *Crime and Inequality*. Palo Alto, CA: Stanford University Press, 174–205.
Baron L, Straus M. (1984) Sexual stratification, pornography, and rape in the United States. In Malamuth NM, Donnerstein E (eds). *Pornography and Sexual Aggression*. Orlando, FL: Academic Press, 186–209.
Baron L, Straus M. (1987) Four theories of rape: a macrosociological analysis. *Socl Probl* **34**:467–88.
Basile KC, Chen J, Black MC *et al*. (2007) Prevalence and characteristics of sexual violence victimization among U.S. adults, 2001–2003. *Violence Vict* **22**:437–48.
Bergdahl J. (1999) An application of convergence theory to women's drinking and driving. *Women and Crim Justice* **10**:93–108.
Bloomfield K, Gmel G, Neve R *et al*. (2001) Investigating gender convergence in alcohol consumption in Finland, Germany, the Netherlands and Switzerland: a repeated survey analysis. *Subst Abus* **22**:39–53.
Bond JC, Roberts SCM, Greenfield TK *et al*. (2010) Gender differences in public and private drinking contexts: a multi-level GENACIS analysis. *Int J Environ Res Public Health* **7**:2136–60.
Brewer VE, Smith MD. (1995) Gender inequality and rates of female homicide victimization across US cities. *J Res Crime Delinq* **32**:175–90.
Butchart A, Engstrom K. (2002) Sex- and age- specific relations between economic development, economic inequality and homicide rates in people aged 0–24 years: a cross-sectional analysis. *Bull World Health Organ* **80**:797–805.
Chafetz JS. (1990) *Gender Equity: An Integrated Theory of Stability and Change*. Newbury Park: Sage Publications.
Cherpitel CJ. (1999) Substance use, injury, and risk-taking dispositions in the general population. *Alcohol Clin Exp Res* **23**:121–6.
Clark-Flory T. (2008) I'm sooo wasted off feminism. *Salon.com*.
DeWees MA, Parker KF. (2003) The political economy of urban homicide: assessing the relative impact of gender inequality on sex-specific victimization. *Violence Vict* **18**:35–53.
Ellis L, Beattie C. (1983) The feminist explanation for rape: an Empirical Test. *J Sex Res* **19**:74–93.
Eriksen S. (1999) Alcohol as a gender symbol. *Scand J Hist* **24**:45–73.
Eschholz S, Vieraitis LM. (2004) Race-specific gender equality and rape: a further test of feminist hypotheses. *Crit Crim* **12**:195–219.
Gartner R. (1990) The victims of homicide: a temporal and cross-national comparison. *Am Sociol Rev* **55**:92–106.
Gartner R, Baker K, Pampel FC. (1990) Gender stratification and the gender gap in homicide victimization. *Soc Probl* **37**: 593–612.
Gauthier DK, Bankston WB. (1997) Gender equality and the sex ratio of intimate killing. *Criminology* **35**:577–600.
Gmel G, Bloomfield K, Ahlstrom S *et al*. (2000) Women's roles and women's drinking: a comparative study in four European countries. *Subst Abus* **21**:249–64.
Gracia E, Herrero J. (2006) Acceptability of domestic violence against women in the European Union: a multilevel analysis. *J Epidemiol Community Health* **60**:123–9.
Grucza RA, Bucholz KK, Rice JP *et al*. (2008) Secular trends in the lifetime prevalence of alcohol dependence in the United States: a re-evaluation. *Alcohol Clin Exp Res* **32**:763–70.
Hausmann R, Tyson LD, Zahidi S. (2007) The global gender gap report 2007. World Economic Forum, Geneva, Switzerland.
Kawachi I, Kennedy BP, Gupta V *et al*. (1999) Women's status and the health of women and men: a view from the States. *Soc Sci Med* **48**:21–32.
Keyes KM, Grant BF, Hasin DS. (2008) Evidence for a closing gender gap in alcohol use, abuse, and dependence in the United States population. *Drug Alcohol Depend* **93**:21–29.
Koenig MA, Ahmed S, Hossain MB *et al*. (2003) Women's status and domestic violence in rural Bangladesh: individual- and community-level effects. *Demography* **40**:269–88.
Koenig MA, Stephenson R, Ahmed S *et al*. (2006) Individual and contextual determinants of domestic violence in north India. *Am J Public Health* **96**:132–8.
Kuntsche S, Knibbe RA, Gmel G. (2009) Social roles and alcohol consumption: a study of 10 industrialised countries. *Soc Sci Med* **68**:1263–70.
Lester D. (1994) Gender equality and the sex differential in suicide rates. *Psychol Rep* **75**:1162.
Lester D. (1996) *Patterns of Suicide and Homicide in the World*. New York: Nova Science Publishers, Inc.
Linsky AS, Bachman R, Straus MA. (1995) *Stress, Culture, & Aggression*. New Haven: Yale University Press.
Mansdotter A, Backhans M, Hallqvist J. (2008) The relationship between a less gender-stereotypical parenthood and alcohol-related care and death: a registry study of Swedish mothers and fathers. *BMC Public Health* **8**:312–24.
Martin K, Vieraitis LM, Britto S. (2006) Gender equality and women's absolute status: a test of the feminist models of rape. *Violence against Women* **12**:321–39.
Mayer P. (2000) Development, gender equality, and suicide rates. *Psychol Rep* **87**:367–72.
McPherson M, Casswell S, Pledger M. (2004) Gender convergence in alcohol consumption and related problems: issues and outcomes from comparisons of New Zealand survey data. *Addiction* **99**:738–48.
Midanik LT, Clark WB. (1995) Drinking-related problems in the U. S.: description and trends (1984–1990). *J Stud Alcohol* **56**:395–402.
Morris A. (2008) Gender bender: more women are drinking, and the women who drink are drinking more, in some cases matching their male peers. This is the kind of equality nobody was fighting for. *New York Magazine*, New York.
Murphy SA, Connelly CD, Evens C *et al*. (2000) Roles, lifestyles, and well-being as predictors of alcohol consumption among young and midlife women. *Health Care Women Int* **21**:677–99.
Neve RJM, Diederiks JPM, Knibbe RA *et al*. (1993) Developments in drinking behavior in the Netherlands from 1958 to 1989, a cohort analysis. *Addiction* **88**:611–21.
Neve RJM, Drop MJ, Lemmens PH *et al*. (1996) Gender differences in drinking behaviour in the Netherlands: convergence or stability? *Addiction* **91**:357–73.
Palma-Solis M, Vives-Cases C, Álvarez-Dardet C. (2008) Gender progress and government expenditure as determinants of femicide. *Ann Epidemiol* **18**:322–29.
Pampel FC. (2001) Gender equality and the sex differential in mortality from accidents in high income nations. *Pop Res Policy Rev* **20**:397–421.
Peterson RD, Bailey WC. (1992) Rape and dimensions of gender socioeconomic inequality in United-States Metropolitan Areas. *Res Crime Delinq* **29**:162–77.
Powell A, White R, Lloyd B *et al*. (2010) VicHealth review of alcohol and interpersonal violence. In: Paper presented at the Kettil Bruun Society Alcohol and Violence Thematic Meeting, Melbourne, Australia. March 15–18; 2010, 2010.
Pridemore WA, Freilich JD. (2005) Gender equity, traditional masculine culture, and female homicide victimization. *J Crim Justice* **33**:213–23.
Rahav G, Wilsnack RW, Bloomfield K *et al*. (2006) The influence of societal level factors on men's and women's alcohol consumption and alcohol problems. *Alcohol Alcohol* **41**: i47–55.
Riddoch L. (2009) We're paying price of 70s and 80s deprivation. In *The Scotsman*, Edinburgh.
Saelan H, Moller L, Koster A. (1992) Alcohol-consumption in a Danish cohort during 11 years. *Scand J Soc Med* **20**:87–93.

Schafer J, Caetano R, Cunradi CB. (2004) A path model of risk factors for intimate partner violence among couples in the United States. *J Interpers Violence* **19**:127–42.
Simpura J, Karlsson T. (2001) Trends in drinking patterns among adult population in 15 European countries, 1950 to 2000: a review. *Nord Stud Alcohol Drugs* **18**:31–53.
Smith MD, Brewer VE. (1995) Female status and the 'gender gap' in U.S. homicide victimization. *Violence against Women* **1**:339–50.
Stanistreet D, Swami V, Pope D *et al*. (2007) Women's empowerment and violent death among women and men in Europe: an ecological study. *J Men's Health Gend* **4**:257–65.
Stout K. (1992) Intimate femicide: an ecological analysis. *J Sociol Soc Welf* **19**:29–50.
Torsheim T, Ravens-Sieberer U, Hetland J *et al*. (2006) Cross-national variation of gender differences in adolescent subjective health in Europe and North America. *Soc Sci Med* **62**:815–27.
Ullman SE. (2003) A critical review of field studies on the link of alcohol and adult sexual assault in women. *Aggress Violent Behav* **8**:471–86.
United Nations Development Programme. (2009) Measuring inequality: gender-related development index (GDI) and gender empowerment measure (GEM). *Human Development Reports*, Vol. 2009, New York.
Vieraitis LM, Williams MR. (2002) Assessing the impact of gender inequality on female homicide victimization across US cities: a racially disaggregated analysis. *Violence against Women* **8**:35–63.
Vieraitis LM, Britto S, Kovandzic TV. (2007) The impact of women's status and gender inequality on female homicide victimization rates: evidence from U.S. counties. *Fem Criminol* **2**:57–73.
Vives-Cases C, Alvarez-Dardet C, Carrasco-Portino M *et al*. (2007) The impact of gender inequality on intimate partner violence in Spain. *Gac Sanit* **21**:242–6.
Whaley RB. (2001) The paradoxical relationship between gender inequality and rape: toward a refined theory. *Gend Soc* **15**:531–55.
Whaley RB, Messner SF. (2002) Gender equality and gendered homicides. *Homicide Stud* **6**:188–210.
Wilsnack SC, Wilsnack RW. (2002) International gender and alcohol research: recent findings and future directions. *Alcohol Res Health* **26**:245–50.
Wilsnack RW, Vogeltanz ND, Wilsnack SC *et al*. (2000) Gender differences in alcohol consumption and adverse drinking consequences: cross-cultural patterns. *Addiction* **95**:251–65.
Wilsnack RW, Kristjanson AF, Wilsnack SC *et al*. (2006) Are US women drinking less (or more)? historical and aging trends, 1981–2001. *J Stud Alcohol* **67**:341–8.
Yllo K. (1983) Sexual equality and violence against wives in American states. *J Comp Fam Stud* **XIV**:67–86.
Yllo K. (1984) The status of women, marital equality, and violence against wives: a contextual analysis. *J Fam Issues* **5**:307–20.
Yodanis CL. (2004) Gender inequality, violence against women, and fear: a cross-national test of the feminist theory of violence against women. *J Interpers Violence* **19**:655–75.