Sex Roles
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ORIGINAL ARTICLE

Are Women More Likely than Men Are to Care Excessively about Maintaining Positive Social Relationships? A Meta-Analytic Review of the Gender Difference in Sociotropy

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Abstract

Sociotropy is defined as the tendency to overemphasize maintaining positive social relationships (Beck 1983). Although the stereotype that women care more about interpersonal relationships than men do is well-documented (Cross and Madson 1997), the literature provides mixed support as to whether women are more sociotropic than men are. This is important to establish because sociotropy consistently correlates positively with depression (Robins et al. 1994) and thus a gender difference in sociotropy could contribute to the well-documented gender difference in depression (Girgus and Nolen-Hoeksema 2006). The present meta-analysis asks whether the gender difference in sociotropy exists, and if so, at what magnitude, by aggregating 108 independent effect sizes from 90 papers ($n = 30{,}372$ participants). The average weighted effect size of the gender difference was $d = .34$, with women scoring higher than men on sociotropy. Culture was a significant moderator: The gender difference in sociotropy was significantly smaller in research from collectivist countries, where interpersonal harmony and cooperation are emphasized for both genders, than in research from individualistic countries, where men are supposed to be independent and agentic and women are supposed to be communal and concerned with relationships. Further research is needed to explore the development of this gender difference and its relationship to the gender difference in depression.

Keywords Human sex differences · Personality · Cross cultural differences · Meta-analysis

The idea that women care more about interpersonal relationships than men do is deeply embedded in gender roles espoused by Western society and in the psychological literature, where considerable data support this idea. Meta-analytic reviews, consisting predominantly of studies conducted in Western societies, have shown that women are more agreeable (Feingold 1994), more interested in vocational activities that are socially oriented toward helping and interacting with people (Su et al. 2009), more cooperative in large groups and mixed-gender interactions (Balliet et al. 2011), and more likely to experience greater intimacy in relationships than men are (Fletcher and Kerr 2010). But are women more likely than men are to care *excessively* about their relationships with other people? Are women more likely to be dependent on others, to be willing to go out of their way to please others, and to base their self-esteem on the feedback that they receive from others? If so, what are the factors that influence this difference? This paper examines these questions through a meta-analysis of studies that have measured sociotropy.

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Sociotropy

Initially coined by Beck (1983), *sociotropy* (social hypersensitivity in the social psychology literature) is a trait-like cognitive style defined as the overemphasis on maintaining positive social relationships. It is composed of three constructs: excessive concern about what others think of oneself, dependency on others for support, and a strong desire to behave in

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ways that please other people (Robins et al. 1994). Sociotropic individuals are described as being very invested in their social relationships and highly motivated to avoid disapproval from people about whom they care (Gorski and Young 2002). Individuals with high levels of sociotropy dislike being alone, worry about criticism from others, feel that they need to be especially nice to others, and are overly apologetic (Beck et al. 1983). Recent studies have shown that a characteristic of sociotropy stemming from this excessive care about relationships is self-esteem that is highly contingent on the feedback received from others (Cikara and Girgus 2010; Dasch et al. 2008). When people who are more sociotropic receive positive feedback, they feel good about themselves. In the absence of positive feedback, however, people who are more sociotropic experience decreased self-esteem, whereas the self-esteem of people who are less sociotropic does not decrease (Cikara and Girgus 2010).

In his initial formulation, Beck (1983) proposed that sociotropy is a vulnerability factor for depression. In particular, Beck and others have theorized that sociotropy confers vulnerability through a diathesis-stress model in which sociotropy is a personality diathesis that interacts with negative life events to lead to depression. Studies have consistently supported the idea that sociotropy is a personality vulnerability for depression. A consistent moderate correlation exists between sociotropy and depression (Robins et al. 1994), and people who are more sociotropic report higher levels of depressive symptoms when they experience negative life events as compared to people who are less sociotropic (Clark et al. 1992; Coyne and Whiffen 1995; Mongrain and Zuroff 1994).

Gender, Depression, and Sociotropy

Over the more than 30 years since Beck (1983) first proposed sociotropy as a personality diathesis for depression, many have assumed or suggested that women are more sociotropic than men are (Girgus and Nolen-Hoeksema 2006; Gorski and Young 2002; Nolen-Hoeksema 1987). Subsequent theorizing has proposed not only that women are more likely to be sociotropic than men, but also that this could, at least in part, account for the well-known gender difference in depression (Girgus and Nolen-Hoeksema 2006). Adult women are about twice as likely as adult men are to develop clinical depression (Parker and Brotchie 2010) and experience greater severity of depressive symptoms (Nolen-Hoeksema 1990). This gender asymmetry arises in adolescence, continues through adulthood and old age, and is hypothesized to be linked to gender differences in risk factors for depression (Nolen-Hoeksema and Girgus 1994; for reviews see Girgus and Yang 2015; Girgus et al. 2017; Piccinelli and Wilkinson 2000). Empirical research has shown that gender differences in vulnerabilities such as sociotropy, ruminatory response style, and social evaluative concerns explain or mediate the gender gap in depression (Calvete 2011; Rudolph and Conley 2005; Trives et al. 2016).

Despite some evidence that sociotropy is a personality vulnerability for depression that differs by gender and may help explain the gender difference in depression, the data about a gender difference in sociotropy appear to be quite mixed. Whereas some findings support the hypothesized gender difference in sociotropy (Clark et al. 1995; Sato and McCann 1998; Scheibe et al. 2003), other studies have found no difference between men and women (Gorski and Young 2002; Hammen et al. 1989, 1992; Zuroff 1994; Sato and McCann 2000). There are many reasons why the data on a gender difference in sociotropy might be inconsistent, including the possibility that there are variables such as age or cultural context that might moderate the gender difference. The mixed findings on the gender difference in sociotropy raise two questions: (a) Is there a significant gender difference in sociotropy, and if so, what is the magnitude of this difference? and (b) If there is a gender difference in sociotropy, what are the characteristics of studies that support the gender difference hypothesis and what are the characteristics of those that do not? Differences in participants' characteristics or study characteristics may affect whether a gender difference is observed. In the present study, the following five variables (cultural differences, age, samples, scale type, and sample size) will be tested as moderators in our meta-analysis.

Cultural Differences in Collectivism and Individualism

In general, characteristics such as interpersonal warmth, caring, communion, and relational concern align with traditional gender role stereotypes and gender role socialization of women, particularly in Western cultures (Abele and Wojciszke 2007; Cuddy et al. 2015; Twenge 1997). Characteristics such as agency, instrumentality, assertiveness, and independence align with the gender stereotypes and gender role socialization of men (Bem 1974; Eagly and Wood 1991; Feingold 1994). At the broader cultural level, interdependence and communality map onto collectivism, and independence and agency map onto individualism (Abele & Wojciske, 2007; Triandis 1995). Thus, it is not surprising that more pronounced gender differences in independent and interdependent self-construals have been found in Western societies compared to Eastern societies (Guimond et al. 2007). Gender intensification during adolescence may result in the internalization of gender roles, such as the traditional role of women as socially sensitive nurturers in Western industrial societies (Cross and Madson 1997; Galambos et al. 1990). Cultural prescriptions for gendered behaviors shape the particular content of roles. For example, in Western societies with White European heritage,

communality and relational intimacy are considered more feminine traits whereas agency and independence are masculine traits (Eagly and Wood 2011; Helgeson 1994). In contrast, in collectivist societies, interpersonal harmony and cooperation are emphasized, which may prescribe a focus on interpersonal sensitivity for both men and women (Nisbett and Masuda 2003). Indeed, experimental cross-cultural research has shown that men in a collectivistic society are perceived to embody collectivistic values more than women do, and men in an individualistic society are perceived to embody individualistic values more than women do (Cuddy et al. 2015).

Differences in the extent to which people identify with interpersonal self-construal and collectivism may be of relevance in determining the conditions under which a gender difference in sociotropy can be found. Sociotropy has a positive correlation with interdependent self-construal (Gorski and Young 2002), which is the degree to which individuals feel connectedness and a sense of shared goals with other members of their society (Markus and Kitayama 1991). Given that sociotropy has conceptual overlap with and positively correlates with interdependence, in nations where more collectivist and interdependent self-construals are generally endorsed by the population, the hypothesized gender difference in sociotropy may be smaller or not exist at all.

Although the majority of studies that measure sociotropy do not also measure the extent to which individuals identify with collectivism/individualism or interdependent/independent self-construal, most studies do contain information about the country in which data collection took place. Nationality can be used as a proxy for assessing cultural differences. Previous research has shown that Western nations of White European heritage endorse more individualist cultures whereas Asian and Middle-Eastern nations endorse more collectivist cultures (Hofstede 2001; Nisbett and Masuda 2003). In order to test this moderator, data on nationality will be grouped into collectivist cultures and individualist cultures based on Hofstede's (2001) categorizations. Collectivistic cultures versus individualistic cultures will be examined as a moderating variable in this meta-analysis.

Age

A robust body of research has documented age and developmental patterns in the gender difference in depression. Prior to early adolescence, there is no observable gender difference in depression among children. Between the ages of 11 and 15, the well-established gender difference emerges; girls and women are twice as likely to be diagnosed with clinical depression and exhibit twice as many depressive symptoms as boys and men do (Nolen-Hoeksema 1987; Nolen-Hoeksema and Girgus 1994). Reviews of empirical research have suggested that gender role socialization as well as the morphological changes at puberty and their psychosocial implications that occur during adolescence may contribute to the gender difference in depression (Girgus and Yang 2015; Negriff and Susman 2011).

During adulthood, family formation can exert continued pressure on women to adopt traditional female responsibilities of childrearing and family care (Helgeson 1994). There is evidence that some personality variables related to gender roles show gender differences in middle adulthood: Women in this age group consistently report higher levels of communion, unmitigated communion, and rumination style than men do (Helgeson and Fritz 1998; Nolen-Hoeksema 1987). Although the gender disparity in depression appears to extend into adult groups aged 65 and older, the factors that predict the gender difference in depression in late life may be different from those that predict the gender difference in depression in adolescence and adulthood (Girgus et al. 2017).

There is little research into how a proposed gender difference in sociotropy might change depending on age. For younger age groups (e.g., adolescents), the gender intensification hypothesis would predict that the gender difference in sociotropy would be heightened beginning in adolescence due to the effects of gender role socialization (Galambos et al. 1990). Additionally, female adolescents experience earlier maturation of brain areas implicated in social cognition and perspective-taking and report greater social sensitivity compared to male adolescents (Bosacki 2000; Flannery and Smith 2017; McClure et al. 2004). Beyond this age, it is unclear whether a gender difference in sociotropy changes over the lifespan. Most studies that have assessed sociotropy have used undergraduate samples. There appears to be mixed support for whether the hypothesized gender difference in sociotropy exists in college samples (Robins et al. 1994; Sato and McCann 2000). Gender differences may also be attenuated in college samples due to self-selection and greater gender convergence on achievement orientation and educational/career goals (Nolen-Hoeksema 1987; Hammen and Padesky 1977).

There is also mixed support for a gender difference in sociotropy in middle adulthood. Mongrain and Blackburn (2005) did not find a significant gender difference in sociotropy for a sample of adults aged 22–54. On the other hand, Bagby and colleagues (Bagby et al. 1998) found that adult, non-student women reported significantly higher sociotropy scores than their male counterparts did. To date, only one known study has examined the hypothesized gender difference in sociotropy in a sample of older adults. In participants aged 65–91, Allen and colleagues found that older women did not score significantly higher on sociotropy than did older men (Allen et al. 1997). Because there is so little data on the elderly, we will examine whether age moderates any gender difference in sociotropy in individuals who are adolescents, college-age adults, and mixed-aged adults.

Clinical Versus Nonclinical Samples

The initial conceptualization of sociotropy arose from observation of clinically depressed participants (Beck 1983). It is possible, therefore, that the hypothesized gender difference in sociotropy reflects something particular to clinical depression. Participants drawn from clinical populations differ from nonclinical participants in various ways. Clinically depressed participants are more likely to report greater numbers of life stressors and are more sensitive to the effects of negative life events (Kessler 1997). Clients, especially women, with clinically diagnosed depression tend to have experienced early emotional stress and abuse in childhood (Frodl et al. 2010; Kendler et al. 2004; Whiffen et al. 2000). These experiences can lead to different consequences for social adjustment and interpersonal relationships in women and men (Whiffen et al. 2000). Nonclinical samples may have greater variance in life experiences, stressors, and personality characteristics than clinical samples do. The gender difference in sociotropy may be obscured in nonclinical samples because variance in personal histories and personality traits of the participants may contribute more noise to the sociotropy measure.

On the other hand, if sociotropy is a stable, trait-like personality, as Beck and others have proposed, sociotropy scores should be relatively constant across the life span, even as symptoms of depression fluctuate. Longitudinal research showing that sociotropy scores are stable across time provides support for this view (Cikara and Girgus 2010; Clark et al. 1992). If sociotropy scores do not vary very much over time, then clinical status should not affect whether there is a gender difference in sociotropy or the size of that difference. We will examine the clinical status of samples as a potential moderator to see whether it is associated with a gender difference in sociotropy.

Scale Type

Aside from participant-level and country-level moderators of a gender difference in sociotropy, study-level moderators can potentially impact sociotropy scores. Sociotropy is measured using self-report instruments, with individuals indicating agreement with statements that describe characteristics of the sociotropic personality style. The Sociotropy-Autonomy Scale (SAS; Beck et al. 1983) was the first known questionnaire to measure this personality variable in adults; it has since been revised to be more psychometrically and conceptually sound (Clark and Beck 1991). The revised version has been adapted for use with children, adolescents, and non-English-speaking adults (Horowitz et al. 2007; Sahin et al. 1993). The SAS sociotropy items consist of statements such as "It is important to be liked and approved of by others." Participants indicate the degree to which they espouse these statements on a 5-point scale from (*never*) to (*all of the time*). The revised SAS sociotropy scale has excellent internal consistency ($\alpha = .87$; Clark and Beck 1991).

The Personal Style Inventory (PSI; Robins et al. 1994) was devised to be a shorter and more psychometrically refined scale. On the PSI, participants report their level of agreement with statements describing sociotropic personality characteristics, such as "I judge myself based on how I think others feel about me." Participants rate their agreement with scale items on a 6-point scale from (*strongly disagree*) to (*strongly agree*). Each item on the PSI falls under one of three factors: concern for what others think, dependency, and pleasing people. However, the subscales have high intercorrelations, and researchers typically use and report the total sociotropy score in analyses. The PSI-Sociotropy scale has excellent internal consistency ($\alpha = .90$; Robins et al. 1994).

Investigations of the similarities and differences between the PSI and SAS have been scarce. The scales share many similarities. Both scales were constructed from characteristics of the sociotropic personality style as conceptualized by Beck (1983). In support of the similarities underlying the two scales, one factor analytic study of the SAS and PSI showed that they are strongly correlated and both predict depressive symptoms (Sato and McCann 1997). At the same time, the nonoverlapping items in the scales are quite different from one another. For example, the SAS includes some items that are not at all present on the PSI such as "The worst part about growing old is being left alone" and "I would be uncomfortable dining out in a restaurant by myself." The SAS also includes items that strongly resemble other psychological constructs, such as anxiety and self-regulation style. Robins and colleagues (Robins et al. 1994) have pointed out that one of the drawbacks of the SAS scale is that it includes an item that contrasts sociotropy and autonomy ("I am more concerned that people like me than I am about making important achievements") instead of being composed only of items that are "pure" measures of sociotropy. Thus we will examine whether the mixed results in the literature about the existence of a gender difference in sociotropy is due to differences in the scale that was used.

Sample Size

Sociotropy has been assessed in a wide range of sample sizes. It is possible that the gender difference in sociotropy exists but is quite weak. Therefore, studies with smaller sample sizes could fail to find a gender difference due to being underpowered. Data from two studies conducted in the same laboratory support this view. Sato and McCann (2000) did not find a gender gap in sociotropy in a sample of 156 undergraduate students. However, with a sample of more than 400 participants, they found that women scored significantly higher on

sociotropy than men did (Sato and McCann 1998). We will examine this possibility in our meta-analysis.

Method

Literature Search and Abstract Screening

We conducted our literature search using the PsycINFO, Web of Science, and PubMed/MEDLINE online databases. In addition, PsycINFO provided access to the ProQuest dissertation database. The literature search was conducted in June, 2015 using the search terms sociotropy, "personal style inventory," "sociotropy autonomy scale," and "sociotropy-autonomy scale." Search terms were combined with "or" in order to include as many relevant search results as possible. The Personal Style Inventory and Sociotropy-Autonomy Scale were included in the search terms because they are the two validated measures of sociotropy. The term "gender" was not included in the search to avoid biasing search results to include a proportionally higher numbers of studies that specifically investigated the gender difference question or studies that reported gender differences. The search returned a total of 633 abstracts. All 112 of the PubMed/MEDLINE results were included in the Web of Science results. An additional three records were identified through outside sources (the unpublished research of the authors and email solicitation through the Society for Personality and Social Psychology OpenForum email list). Therefore, we conducted primary screening procedures on the 524 abstracts from the Web of Science and PsycINFO databases. Figure 1 shows the PRISMA flow diagram of the search and screening process (Moher et al. 2009).

For the first stage of the screening process, abstracts were evaluated for inclusion based on the following criteria: (a) The study was reported in English, (b) both men and women were included in the sample, (c) there were at least 10 women and 10 men in the sample, (d) the study was empirical, (e) the study measured sociotropy using the Personal Style Inventory or the Sociotropy-Autonomy Scale, and (f) studies

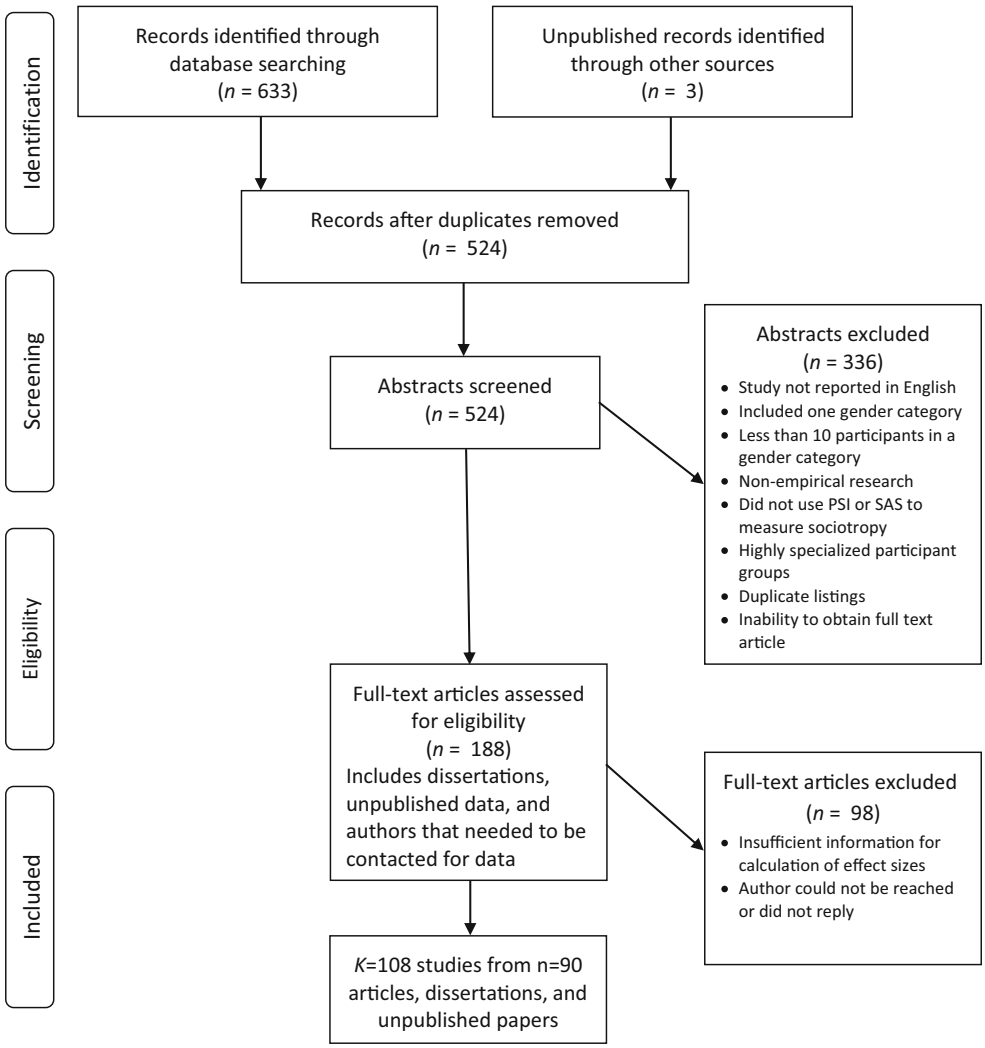

Fig. 1 PRISMA flow diagram of screening procedures (based on Moher et al. 2009; http://prisma-statement.org/PRISMAStatement/PRISMAStatement.aspx)

did not comprise highly specialized participant groups (e.g., ex-cult members) or clinical participants with dementia or symptoms of psychosis.

In the second stage of the screening process, articles and dissertations were obtained by downloading the pdf files from PsycINFO, PubMed, Web of Science, Google Scholar, and interlibrary loan. We reviewed these articles, dissertations, and unpublished research for coding. After these stages of screening, a total of 336 abstracts were eliminated due to the following reasons: double listings between databases and search results, inability to obtain full access to articles, or failure to meet the inclusion criteria we listed. For the 188 papers that remained, 50 published articles, dissertations, and unpublished data included information for the calculation of effect sizes. For the papers that did not include information for the calculation of effect sizes, the first authors were contacted via email. When the first author could not be reached, the corresponding author was contacted if different from the first author. The contact information for authors was obtained through correspondence information in articles, the American Psychological Association's member directory, university directories, and Google search. The emails requested the means and standard deviations of sociotropy for the women and men in the samples with missing effect size information. Authors provided usable data for 40 papers. The remaining 98 papers were excluded because authors could not be reached, did not respond to the emailed requests, or replied that the data were not available.

This process resulted in a final sample of 90 articles with usable sociotropy-by-gender data. The articles yielded 108 independent studies with data for effect size calculation for the gender difference in sociotropy. In the final sample, 94 studies were from published journal articles or chapters, 13 were from unpublished dissertations, and two were from unpublished studies.

Coding Procedures

The following information was coded from each study: (a) means and standard deviations for sociotropy scores for males and females; (b) *t* tests, *F* tests, *r*-statistics, and *p*-values for the gender difference in sociotropy; (c) sample type (nonclinical or clinical); (d) mean age of participant; (e) scale type (PSI or SAS), (f) country where study was conducted, (g) number of male and female participants in the study; (h) study design (cross-sectional or longitudinal); and (i) publication type (peer-reviewed journal article, dissertation, or unpublished study). Studies were coded by the first author directly into Microsoft Excel. A random subset of 58 (53.70%) studies was coded by a research assistant. Comparison of the two coders showed acceptable levels of agreement for moderator variables: sample type (Kalpha = .78), scale type (Kalpha = 1.00) country (Kalpha = 1.00), age (Kalpha = .82), sample size for males (Kalpha = .97), and sample size for females (Kalpha = .96) (Hayes and Krippendorff 2007). For additional moderators, publication type had excellent interrater agreement (Kalpha = 1.00) whereas study design had fair agreement (Kalpha = .59). Discrepancies in coding were settled verbally by the two coders.

Study Sample

Each study was considered one unit of analysis. Thus, no sample was included more than once in the aggregation of effect sizes. This approach strikes a balance between including the maximum amount of usable data and ensuring that the final effect size sample comprises independent units (Cooper 2010). Using each study as a unit of analysis is considered preferable over using only one effect size from each research team, which may be overly conservative and result in complications and biases from selecting one effect size to represent an entire laboratory group (Cooper 2010).

When multiple studies drew from one large pretest sample, only the effect size from the large pretest was included. For longitudinal studies that contained more than one measurement of sociotropy, only the data from the first time point were included in the analysis. These measures were taken to ensure the independence of effect sizes. Sometimes a single study contained more than one measure of sociotropy. For example, Sato and McCann (2000) administered both the SAS and the PSI to the same sample of participants. In such cases, only the effect size obtained for the SAS was included in the analysis. This was done in order to increase the sample size of studies in the SAS group so that the subsequent moderator analysis of scale type would have more even groups.

The final sample included in the meta-analysis comprised 108 effect sizes calculated and estimated from 90 papers that collected data from a total of 30,372 participants (18,938 women and 11,434 men). Table 1 shows the final sample of studies included in the meta-analysis with the accompanying raw effect sizes on the gender difference in sociotropy and moderator variables.

Computation of Effect Sizes

In the present meta-analysis, the dependent variable was the standardized mean difference (Cohen's *d* effect size) for sociotropy scores between women and men. The standardized mean difference effect sizes were computed or estimated from each study. The formula for *d* was taken from Cohen (1988). According to the formula, *d* was calculated by subtracting the mean sociotropy score for men from the mean score for women, and then dividing by the pooled groups standard deviation: $d = \text{Mean}_1 - \text{Mean}_2/\text{SD}_{\text{within}}$. When means and standard deviations were not available, *t*-test, *F*-test, and *r* values were obtained and converted to an estimation of *d* using formulae

Table 1 Study information and unweighted Cohen's *d* effect sizes for the articles included in the present meta-analysis

Study	Year	Scale type	Age[a]	Country[b]	Sample type[c]	*n*-males	*n*-females	*d*
Allen et al.	1996	PSI	2	15	1	50	50	.47
Alloy et al.	2009	SAS	2	1	2	182	268	.01
Altay et al.	2012	SAS	2	9	1	39	244	.36
Anastasio	2010	PSI	2	1	1	97	296	.50
Bagby et al.	1998	PSI	3	2	1	379	490	.49
Bagby et al.	1998	PSI	3	2	2	31	70	.64
Baker et al.	1997	SAS	3	1	2	13	50	.92
Baron & Peixoto	1991	SAS	1	2	1	60	74	.47
Beck et al.	2003	PSI	2	1	1	50	117	.54
Bershad	2001	PSI	3	1	1	32	57	.36
Beshai et al.	2015	SAS	2	2	1	87	110	.60
Birgenheir et al.	2010	PSI	2	1	1	30	80	.44
Brenning et al.	2011	PSI	1	8	1	145	162	.73
Bruch	2002	PSI	2	1	1	118	114	.33
Bruch	2002	PSI	2	1	1	95	94	.33
Calvete	2011	SAS	1	6	1	407	446	.42
Campbell & Kwon	2001	PSI	2	1	1	87	145	.42
Campbell et al.	2003	PSI	2	1	1	60	105	.36
Cardilla	2008	PSI	2	1	1	48	61	.68
Cikara & Girgus	2010	PSI	2	1	1	25	42	.67
Clark & Beck	1991	SAS	2	2	1	148	273	.53
Clark et al.	1995	SAS	2	2	1	397	618	.33
Connor-Smith & Compas	2002	PSI	2	1	1	123	260	.42
Dasch et al.	2008	PSI	2	1	1	78	92	.39
Davila	2001	PSI	2	1	1	70	150	.50
Desmet et al.	2010	PSI	3	8	2	87	176	.41
Desmet et al.	2010	PSI	2	8	1	132	660	.28
Dunkley et al.	1997	SAS	2	2	1	102	131	−.04
Dunkley et al.	2006	SAS	2	2	1	167	299	.51
Exline & Zell	2012	PSI	2	1	1	80	70	.54
Exline & Zell	2012	PSI	2	1	1	59	77	.61
Exline et al.	2004	PSI	2	1	1	54	40	.43
Exline et al.	2012	PSI	2	1	1	41	60	.22
Exline et al.	2012	PSI	2	1	1	30	107	.33
Flett et al.	1997	PSI	2	2	1	83	93	.72
Freiheit	1998	PSI	3	1	2	25	39	.42
Frewen & Dozois	2006	PSI	2	2	1	77	98	.57
Gencoz et al.	2006	SAS	2	9	1	89	104	−.23
Goff	1998	PSI	2	1	1	88	138	.40
Gorski & Young	2002	PSI	1	1	1	50	71	.22
Gray	1998	SAS	2	1	1	308	385	.22
Hammen et al.	1989	SAS	N/A	1	2	10	26	.14
Hong & Lee	2001	PSI	2	4	1	140	119	.22
Hong et al.	2003	PSI	2	4	1	294	214	.07
Horowitz et al.	2007	SAS	1	1	1	166	204	.42
Iacoviello et al.	2009	SAS	2	1	2	111	231	.21
Jolly et al.	1996	PSI	3	1	2	13	47	.81
Kwon et al.	2001	PSI	2	1	1	19	31	.02
Laurent & Powers	2006	SAS	2	1	1	125	125	.40
Lynch et al.	2001	PSI	3	1	2	23	50	.46
Mak et al.	2011	PSI	2	1	1	137	277	.25
Malkina-Pykh & Pykh	2013	PSI	3	14	1	28	108	.32
McBride et al.	2005	PSI	3	2	2	118	202	.24
Mongrain & Blackburn	2005	PSI	3	2	2	20	77	.02
Morse et al.	2002	PSI	3	1	2	58	130	.33
Oates-Johnson & DeCourville	1999	SAS	2	2	1	61	159	.54
O'Garro-Moore et al.	2015	SAS	N/A	1	1	17	43	−.07
O'Garro-Moore et al.	2015	SAS	N/A	1	2	18	32	−.19
O'Garro-Moore et al.	2015	SAS	N/A	1	2	17	44	.07
O'Neill	1998	PSI	2	1	1	30	63	−.03
O'Neill	1998	PSI	2	1	1	42	61	.33
Otani et al.	2012	SAS	3	3	1	260	156	.30
Ouimette et al.	1996	PSI	N/A	1	1	86	162	.30
Prenoveau et al.	2009	PSI	1	1	1	180	408	.30
Prince	1999	SAS	3	1	1	20	20	.92
Raeisei et al.	2015	PSI	N/A	13	1	47	55	.87
Robins et al.	1994	PSI	2	1	1	91	247	.25
Rose & Anastasio	2014	PSI	2	1	1	171	515	.62

Table 1 (continued)

Study	Year	Scale type	Age[a]	Country[b]	Sample type[c]	*n*-males	*n*-females	*d*
Rude & Burham	1995	SAS	2	1	1	143	280	.37
Sato	1999	SAS	2	2	1	122	133	.23
Sato	2003	SAS	2	1	1	246	268	.21
Sato & Gonzalez	2009	SAS	2	1	1	100	100	.72
Sato & McCann	1997	SAS	2	2	1	159	528	.22
Sato & McCann	1998	SAS	2	2	1	147	505	.21
Sato & McCann	2000	SAS	2	2	1	69	224	.33
Sato et al.	2009	SAS	2	1	1	110	110	.74
Sato et al.	2010	SAS	2	1	1	69	126	.12
Scheibe et al.	2003	PSI	3	2	2	104	185	.37
Schill & Sharp	1995	PSI	2	1	1	55	55	−.31
Schulte et al.	2008	PSI	3	2	2	32	95	.01
Schwartz	1996	PSI	2	1	1	12	49	.72
Shih & Auerbach	2010	PSI	2	1	1	67	139	.42
Shih & Eberhart	2010	PSI	2	1	1	502	923	.26
Sibley	2007	PSI	2	11	1	127	290	−.08
Sibley	2007	PSI	2	11	1	68	175	.35
Sibley	2007	PSI	2	11	1	22	79	.42
Sibley & Overall	2007	PSI	2	11	1	29	92	.40
Sibley & Overall	2008	PSI	2	11	1	14	75	−.44
Sibley & Overall	2010	PSI	2	11	1	76	103	.32
Soffer et al.	2008	PSI	2	10	1	31	172	.37
Steer & Clark	1997	SAS	2	2	1	53	107	.32
Sutherland & Morley	2008	PSI	3	12	2	31	51	.31
Teppers et al.	2013	PSI	1	8	1	500	888	.51
Teppers et al.	2013	PSI	2	8	1	63	356	.78
Vogel et al.	2000	SAS	3	7	1	13	28	1.00
Vogel et al.	2000	SAS	3	7	2	12	28	.47
Vogel et al.	2000	SAS	3	7	2	10	23	.21
Whiffen et al.	2000	SAS	N/A	1	1	21	40	−.10
Whiffen et al.	2000	SAS	N/A	1	1	62	69	.16
Wong & Mak	2013	PSI	2	5	1	101	244	−.12
Yang	2015	PSI	2	1	1	28	68	.81
Yang	2015	PSI	3	1	1	346	386	.36
Yang	2015	PSI	3	1	1	472	358	.27
Yang et al.	2012	PSI	2	1	1	77	135	.40
Yazici	2008	SAS	2	9	1	385	241	.12
Yuksel-Sahin	2012	SAS	N/A	9	1	171	239	.05
Zuroff & Fitzpatrick	1995	PSI	2	2	1	86	74	.17
Zuroff & Fitzpatrick	1995	PSI	2	2	1	74	75	.55

Positive *d* values indicate that women scored higher than men on sociotropy. (References for studies cited in Table 1 can be found in the online supplement)

[a] *1*, preadolescents and adolescents (12–17); *2*, young adults (18–22); *3*, middle adults (23–50)

[b] *1*, USA; *2*, Canada; 3, Japan; *4*, South Korea; *5*, China; *6*, Spain; *7*, Norway; *8*, Belgium; *9*, Turkey; *10*, Israel; *11*, New Zealand; *12*, United Kingdom; *13*, Iran; *14*, Russia; *15*, Australia

[c] *1*, nonclinical; *2*, clinical

N/A, data not available

from Cohen (1988). Positive *d* values indicated that women scored higher on sociotropy than did men, whereas negative *d* values indicated that men scored higher than women did.

Homogeneity statistics and confidence intervals for aggregated bias-corrected effect sizes were calculated using Comprehensive Meta Analysis (CMA). The homogeneity analysis calculates a test statistic (*Q*) to examine the assumption that the effect sizes estimate a common population mean. A nonsignificant *Q* indicates that the variance in the effect size distribution is due to random sampling error. A rejection of the null hypothesis suggests that the variance cannot be accounted for by random sampling error alone. This suggests that the variance in the sample of effect sizes could be explained by systematic between-study differences and that moderator analyses should be carried out to test theoretical explanations of the variance in effect sizes.

Larger samples provide more accurate estimates of the underlying population effect size. Analyzing effect sizes in their raw forms gives more weight to small sample sizes. To correct for this sample size bias, we weighted effect sizes using Hedges and Becker's (1986) *g* statistic. Effect sizes were corrected for bias before aggregation and inclusion in moderator analyses.

Random-Effects Model and Moderator Analyses

We selected a random-effects model for data analysis. Fixed-effect models assign effect size variance to subject-level

random sampling error alone and should only be used when all possible moderators of effect size variance can be tested (Cooper 2010). Random-effect models assume that there is error in the subject level and in the study level as well. In other words, random effects models take into account that there is unmeasured variance in effect sizes between studies and that each study is estimating the gender difference of a slightly different underlying population (Cooper 2010). Because the present study does not assume that it includes every possible study that has measured sociotropy and every possible moderator that could be identified, we used the more conservative random-effects model (Lipsey and Wilson 2001).

Moderator analyses were performed to test whether the variation in *d* values could be explained by theoretically predicted variables across studies. The analogue to the analysis of variance and meta-regression were performed on categorical and continuous moderators, respectively. Random-effects moderator analyses were calculated using CMA. The moderators tested in the present meta-analysis were culture, age, clinical status, scale type, and sample size. We also examined possible sources of publication bias in our meta-analysis by comparing effect sizes across different publication types and by using the trim-and-fill and fail-safe N methods of investigating bias.

Results

Effect Size Aggregation

In 98 of 108 (90.7%) effect sizes, women scored higher on sociotropy than men did. The mean weighted effect size, confidence interval, homogeneity statistics, and random-effects variance components were calculated using CMA. Results supported our main hypothesis that women would score higher than men on sociotropy (Hedge's $g = .34$, 95% CI [.30, .38], $p < .001$; $d = .34$, 95% CI [.30, .38], $p < .001$). Table 1 shows effect size and moderator information for each study included in our meta-analysis. (For a complete reference list, including the studies cited in Table 1, please see the online supplement). The assumption of the homogeneity of variance of the sample was rejected, $Q(107) = 275.14$, $p < .001$, $I^2 = 61.11$. This suggests that the variance in effect sizes was not due to random sampling error alone and that systematic variance is present in the sample. Therefore, we performed moderator analyses on the sample to test whether several different potential moderators could explain the variance in effect sizes.

Moderator Analyses

Individualist Versus Collectivist Cultures

The studies included in the meta-analysis represented 15 countries: United States, Canada, New Zealand, Australia, Norway, Belgium, Spain, Japan, Israel, Turkey, Korea, Russia, Iran, China, and the United Kingdom. Of these countries, individualism is more associated with the Western nations of the United States, Canada, New Zealand, Australia, Norway, Belgium, and the United Kingdom, whereas collectivism is associated with the societies of South Korea, Japan, China, Turkey, Iran, and Russia (Hofstede 2001; Nisbett and Masuda 2003; Uskul et al. 2004). Spain and Israel were excluded from the analysis. According to Hofstede's national culture dimension ratings, Spain falls in the middle of the range from collectivism to individualism and Israeli culture is represented by a blend of individualism and collectivism (Hofstede 2001).

The individualism versus collectivism of the larger society from which the study samples were drawn was tested as a potential moderator of the gender difference in sociotropy. There was a significant between-group difference in effect size variance due to culture, $Q(2) = 8.07$, $p = .02$. Closer inspection of effect sizes across cultures showed that the gender difference in sociotropy was smaller in collectivist nations compared to individualist nations. The effect size of the gender difference in individualistic cultures was significant at $d = .36$, 95% CI [.32, .40], $p < .001$ (see Table 2). The effect size of the gender difference in collectivistic cultures was weaker but still statistically significant at $d = .16$, 95% CI [.02, .30], $p = .03$.

We also entered culture as a continuous variable in a meta-regression. Using Hofstede's (2001) ratings on the individualism dimension, we regressed country-level individualism scores on the weighted effect size of the gender difference in sociotropy. The random effects model was significant, R^2 analog = .15, $Q(1) = 6.96$, $p = .008$. Individualism score accounted for significant variance in the gender difference in sociotropy, with higher scores on individualism associated with greater gender differences (standardized coefficient = .003, $SE = .001$, 95% CI [.001, .005], $p = .008$.

Table 2 Categorical moderator variables of the gender difference in Sociotropy and group count (k), mixed effects weighted mean effect size after sample size bias correction (d), and Z-value

Categorical moderator	*k*	*n*	*d*	95% CI	*Z*
Culture					
Individualist	96	26,038	.36***	[.32, .40]	16.69
Collectivist	10	3278	.16*	[.02, .30]	2.25
Age					
Adolescents	7	3761	.45***	[.35, .55]	8.64
College-aged adults	70	20,499	.33***	[.28, .39]	12.26
Mixed-age adults	22	5201	.37***	[.30, .44]	10.44
Sample type					
Clinical	19	2739	.27***	[.17, .38]	5.07
Nonclinical	89	27,633	.35***	[.30, .39]	15.08
Scale type					
PSI	69	18,585	.37***	[.31, .42]	13.80
SAS	39	11,787	.30***	[.23, .37]	8.30

*$p < .05$. ***$p < .001$

Age

Three age groups were represented in the sample: adolescents (12–17 years of age), college-aged adults (18–22 years of age), and mixed-age adults (M_{age} plus two standard deviations ≤65, or, in the absence of reported mean and standard deviation, an age range of 18–65). There were seven studies in the adolescent group, 70 studies in the college-aged group, and 22 studies in the mixed-age adult group. Of the 22 studies included in the mixed-age adult group, 16 reported mean ages and standard deviations and six reported an age range of 18–65. Due to the absence of studies comprised of young children (< 12 years) or older participants (65+ years), we were unable to construct categories for these age groups. Eight studies from five articles did not report sufficient data on age to apply the age group criteria (Hammen et al. 1989; Whiffen et al. 2000; O'Garro-Moore et al. 2015; Raeisei et al. 2015; Yuksel-Sahin 2012). One study reported an average age plus two standard deviations that exceeded the age criteria for the mixed-age adult group (Ouimette et al. 1996).

The mean weighted effect size for the gender difference in each age group was significant, with females scoring higher on sociotropy than males in the pre-adolescent/adolescent, college-aged young adults, and mixed-age adult groups. The analog to the ANOVA was conducted with the three age groups as categorical variables. The results for effect sizes by group are shown in Table 2. The effect size for the gender difference was significant for each age group, with women scoring higher than men on sociotropy. However, the difference in effect size variance grouped by age was not significant, $Q(3) = 7.54$, $p = .06$. Follow-up pairwise analyses of age groups showed that there was no significant difference between the adolescent and college-aged groups, $Q(2) = 4.33$, $p = .12$, or between college-aged and mixed adult groups, $Q(2) = .75$, $p = .69$. There also was no significant difference in effect size between the adolescent and mixed age adult groups, $Q(2) = 5.16$, $p = .08$.

A majority of studies reported the mean age of their samples. For the $k = 85$ studies that reported mean age, we entered mean sample age as a continuous moderator in a meta-regression. The random effects model was not significant (R^2 analog < .01), $Q(1) = .01$, $p = .94$. Mean age of participants did not predict the effect size of the gender difference in sociotropy, standardized coefficient = .0003, $SE = .004$, 95% CI [−.007, .007], $p = .94$.

Clinical Versus Non-Clinical Samples

Sample type was coded as clinical or nonclinical to test the prediction that the gender difference in sociotropy would be observed in clinical samples but not in nonclinical samples. The aggregated effect sizes were significant in the female direction for both clinical and nonclinical samples, and the analog to the ANOVA revealed that the difference in effect size variance between clinical and nonclinical samples was not significant, $Q(1) = 1.67$, $p = .20$. Table 2 shows the effect size results grouped by clinical and non-clinical samples.

Scale Type

Moderator analyses were conducted to test whether effect size variance was due to the type of sociotropy scale administered. There was not a significant difference in effect size variance between studies that used the PSI compared to studies that used the SAS, $Q(1) = 2.28$ $p = .13$. The effect size for the gender difference in sociotropy was significant for both those studies using the PSI and those using the SAS, as shown in Table 2.

Sample Size

We used meta-regression using unweighted Cohen's d to test sample size as a potential moderator. We used the unweighted effect sizes instead of Hedge's g because g is weighted by the sample size of each study. Meta-regression analysis was performed using CMA. The analysis tested the hypothesis that the gender difference in sociotropy would be larger (or smaller) as the number of participants in the study increased. Random effects generalized least squares regression indicated that the model with sample size as the predictor variable did not significantly predict effect size variance ($\beta < .001$), $Q(1) = .21$, $p = .64$.

We then divided the studies in the meta-analysis into those that found a statistically significant gender difference (coded as 1) and those that found a non-significant ($p \geq .05$) gender difference (coded as 0). The point-biserial correlation between significance (dichotomous variable) and study sample size (continuous variable) was significant ($r_{pb} = .26$, $p = .006$). This test shows that studies that found a nonsignificant gender difference in sociotropy tended to have smaller sample sizes than did studies that found a significant gender difference.

Additional Moderator and Publication Bias Analyses

We performed moderator analyses to examine if effect size variance could be accounted for by study design. The total sample included 88 effect sizes from cross-sectional studies and 20 from longitudinal studies, including diary studies. Using the analog to the ANOVA, no significant differences were found between study design groups in accounting for effect size variance, $Q(1) = 1.44$, $p = .23$.

We conducted additional analyses to examine if variance in effect sizes was due to publication bias. The total sample comprised 93 effect sizes from published journal articles and 15 effect sizes from unpublished dissertations and unpublished research studies. The analog to the ANOVA showed that

effect size variance was not accounted for by type of report, $Q(1) = .35$ $p = .56$. The possibility of publication bias in the present meta-analysis was further examined using classic bias-probing analyses. The fail-safe N calculation revealed that there would need to be 7757 missing studies with a null effect of gender on sociotropy in order to bring the p value of the omnibus effect size to greater than $\alpha = .05$.

In order to further probe for publication bias in our sample, we used the nonparametric trim-and-fill procedure (Duval and Tweedie 2000). Trim-and-fill estimates the number of studies missing in the asymmetric portion of the funnel plot. It then removes the outlying asymmetric portions of the funnel plot and "fills" in the plot symmetrically about the center. The adjusted mean effect size is then recalculated from this funnel plot. In this sample, zero studies were filled above the estimated effect size, and 14 studies were filled below the estimated effect size. The recalculated mean effect size using the random effects model was $d = .30$ (95% CI [.25, .34]). Based on these analyses and the fact that about 13% of the effect sizes in our meta-analysis were drawn from unpublished research, it is unlikely that publication bias was a strong influence on the results.

Discussion

In the present study we examined whether the hypothesized gender difference in sociotropy (Beck 1983) exists, at what magnitude it exists, and what variables affect its strength. Our meta-analysis of 108 effect sizes revealed that the hypothesized gender difference in sociotropy exists: Women scored significantly higher than men did on this personality characteristic. To answer the second question of magnitude, the gender difference in sociotropy showed a small-to-moderate effect at $d = .34$ (95% CI [.30, .38]). (According to Cohen's 1988, guidelines concerning effect sizes, $d = .20$ is considered a small effect, $d = .50$ is a medium effect, and $d = .80$ is a large effect.) A series of analyses of possible moderators, including individualism versus collectivism, age, and clinical versus non-clinical samples, revealed that only culture, as measured by individualism and collectivism, was a significant moderator of the gender and sociotropy relationship. Specifically, the magnitude of the relationship was significantly larger in countries with individualistic cultures than in countries with collectivistic cultures (although the gender-sociology relationship was significant in both cultures).

The Gender Difference in Sociotropy

One of the consistently puzzling aspects of the literature on a possible gender difference in sociotropy is how mixed the data are. We undertook this meta-analysis to ascertain whether there is sufficient consistency in the literature to warrant a claim that there is a gender difference in sociotropy. This is an important question because sociotropy has been proposed as a construct that contributes to the gender difference in depression, but this model will only hold up if there is a gender difference in sociotropy. Our analysis establishes a strong claim for a gender difference in sociotropy with a mean effect size that is similar to those of prior meta-analyses that demonstrated gender differences in psychological variables such as anxiety, self-esteem, cooperation in mixed-gender interactions, guilt, and shame (Balliet et al. 2011; Else-Quest et al. 2012; Feingold 1994; Hyde 2005; Kling et al. 1999). The effect size observed in the present study ($d = .34$) is greater than or similar to the magnitude of the effect size of the gender difference in depression diagnosis ($d = .37$), depressive symptoms ($d = .27$), and the gender difference across multiple psychological domains ($d = .21$) (Hyde 2014; Salk et al. 2017; Zell et al. 2015).

One obvious question is why, at the outset, did evidence for the gender difference appear to be mixed? The results from the present study suggest that at least some of the studies that did not find a gender difference were simply underpowered. The point-biserial correlation analysis that examined this possibility was significant. This suggests that some of the nonsignificant gender differences in sociotropy that have been reported were due to a lack of power in those studies.

Moderators of the Gender Difference in Sociotropy

Of the moderator analyses we conducted in our meta-analysis, culture was the only factor that accounted for significant variation in the magnitude of the gender difference in sociotropy. Culture was considered a potential moderator based on the prediction that countries that tend toward individualism would show the expected gender difference in sociotropy whereas countries that tend toward collectivism would show a smaller gender asymmetry. The results of the moderator analysis supported this hypothesis. The effect of the gender difference in sociotropy was significantly higher in individualistic nations compared with collectivist nations. This finding supports previous theorizing on the effect of context and socialization on gender roles: Stereotypes and prescribed roles for the genders will be based on the norms, values, and expectations of a particular culture (Cross and Madson 1997; Donnelly et al. 2016). Gender roles associated with Western, European-heritage, individualistic societies are not necessarily shared by non-Western, collectivistic societies (Cuddy et al. 2015). Therefore, it is not surprising that men and women in more collectivistic societies score more similarly on sociotropy, a cognitive style that describes hypersensitivity toward interpersonal interactions. The present study provides additional evidence for the effects of culture, context, and socialization on gender roles and gender differences.

In the present study we examined the gender difference in sociotropy across three age groups: adolescents, college-aged

young adults, and mixed-aged adults. The results from the meta-analysis showed that the gender gap in sociotropy was significant in all three age groups. The gender difference in sociotropy was larger among adolescents than among college-aged adults and mixed-age adults, and larger among mixed-age adults than among college-aged adults, but there was not a significant difference in effect sizes by age group. This is similar to findings from a recent meta-analysis of the gender difference in depression which showed a significant effect of developmental group: effect sizes peaked in adolescence and then attenuated and remained consistent from young adulthood into older age (Salk et al. 2017). In the present study, however, the association between mean age of sample and effect size of the gender difference in sociotropy was not linear.

The mixed-age adult group assessed in this sample was comprised of individuals ranging in age from 16 to 80, with an average age in the mid-30s. This is a very large range of ages and therefore it is difficult to interpret the effect size data for this group. The lack of research focusing on middle-aged and older adult samples separately prevents any meaningful analysis of changes in sociotropy across the lifespan.

We note that only seven effect sizes in our meta-analysis were drawn from adolescent samples. This limitation highlights the need for research that investigates the development of sociotropy in childhood and adolescence, the emergence of the gender difference in sociotropy, and whether the emergence of the gender difference in sociotropy predicts the emergence of the gender difference in depression.

Given that clinical and nonclinical samples differ in systematic ways, we investigated sample type as a potential moderator of the gender difference in sociotropy. Our analysis showed that the gender difference in sociotropy between clinically depressed men and women tended to be *smaller* than the gender gap observed for nonclinical samples. However, this difference was not significant. These results appear to support the conceptualization of sociotropy as a stable, trait-like personality characteristic (Robins et al. 1994).

Implications for Understanding Sociotropy

The purpose of our study was to conduct a quantitative review of the literature on sociotropy in order to determine whether the hypothesized gender difference in sociotropy exists. The outcome of this meta-analysis has important implications for the hypothesis that a gender difference in sociotropy may be one of many factors that contribute to the development of the gender difference in depression (Nolen-Hoeksema and Girgus 1994). A very weak or null finding for the gender difference in sociotropy would have cast considerable doubt on this hypothesis.

What does it mean that women scored higher on sociotropy than men do? Is the gender difference in sociotropy sizeable enough to explain the large gender disparity found for depression? Although the mean effect size of the gender difference in sociotropy is in the small-to-moderate range, this difference may still be impactful. One way that a slight but significant gender difference in sociotropy could explain the larger difference in mental health consequences is that sociotropy is correlated with low self-esteem, ruminatory style, and excessive reassurance-seeking behavior (Birgenheir et al. 2010; Butler et al. 1994; Gorski and Young 2002). Not only are all of these variables positively correlated with depressive symptoms, but gender differences have been noted for all of them. Women score consistently lower than men on self-esteem and score higher than men on ruminatory style and excessive reassurance-seeking (Kling et al. 1999; Nolen-Hoeksema 1987; Starr and Davila 2008). One possibility is that coping styles and interpersonal behaviors, which are themselves risk factors for negative mental health outcomes, are "piled on" in more sociotropic individuals. Interpersonal orientation variables (e.g., sociotropy) and depressogenic coping styles (e.g., excessive reassurance-seeking and rumination) appear to be some of many predictors of the gender difference in depression, which is over-determined by social and psychological risk factors that vary according to developmental stage (Girgus and Yang 2015; Girgus et al. 2017). It is our hope that the findings from the present meta-analysis can enable researchers to focus on sociotropy as one of several potential mediators of the gender difference in depression.

Limitations and Future Research

One of the benefits of conducting a meta-analysis is that major gaps in the literature are called to attention. Presently, there is much less research on sociotropy in children, adolescents, mixed-age adults, the elderly, clinical samples, and non-Western countries than on sociotropy in college-aged adults, non-clinical samples, and individualistic cultures. As shown in Table 2 and mentioned earlier in our paper, we classified 70 studies with college-aged adults and 22 studies with mixed-age adults, but only seven studies with adolescent participants. There were no studies with children and only one study with older participants. There were 19 studies with clinical participants as compared to 89 studies with non-clinical participants. Although the number of individualistic and collectivistic countries represented in the sample were approximately equal, there were 96 studies from individualistic countries (largely from the United States) and only 10 studies from collectivist countries.

Interestingly, there is also very little empirical research that examines the relationship between the gender difference in depression and individualism/collectivism. Although studies show that there is a gender difference in both depressive episodes and depressive symptoms worldwide (Salk et al. 2017), it is unknown whether the size of these gender differences is moderated by culture.

An important area of future study will be testing the socialization hypothesis for sociotropy. According to the gender intensification process, young women and men are subject to increased socialization pressures that emphasize stereotypically gendered behaviors in adolescence (Cross and Madson 1997; Nolen-Hoeksema 2001). Examining these processes requires research into whether a gender difference in sociotropy exists for younger children or whether it emerges in adolescence in parallel with the gender difference in depression. The paucity of studies with child or adolescent participants make it impossible to examine these questions with currently available data. The one known study on elderly adults found that women and men scored similarly on the personality characteristic (Allen et al. 1997). Assuming this finding holds up in additional studies, a key question would be whether this convergence of sociotropy scores is explained by a decrease in sociotropy among older women or an increase in sociotropy in older men.

Likewise, there is a lack of studies examining sociotropy in populations with more diverse ethnic and national backgrounds. The relative paucity of data on non-Western and collectivist cultures makes it more difficult to generalize the results obtained in the present sample. Our review suggests that people of both genders who are from societies which emphasize interpersonal connections do not differ as greatly in their endorsement of sociotropic cognitive style as people of both genders from societies that emphasize independence and agency. These findings appear to be in line with previous research showing that in a more collectivistic cultural milieu, men are more likely to display characteristics of heightened concern for positive social interactions and relationships (Guimond et al. 2007). More studies in diverse populations will need to be conducted before more conclusive interpretations can be made.

Furthermore, cultural differences do not only exist cross-nationally, but also among regions and groups within countries as well. The present meta-analysis coded culture at the national level. We did not distinguish between racial and ethnic groups within a country, often because the sample size of racial/ethnic minority groups was small or sociotropy scores by race/ethnicity were not reported. We note that the Mak et al. (2011) study included in our meta-analysis reported sociotropy scores by ethnicity. In their study, Asian Americans scored higher than did European Americans on sociotropy and interdependent self-construal, an individual difference which is closely associated with collectivism. Upon inspection of the gender difference in sociotropy, the effect of gender on sociotropy was weaker for Asian Americans ($d = .23$) than for European Americans ($d = .35$), which is consistent with our findings for nation-level collectivism as a moderator of the gender difference in sociotropy.

Some researchers have proposed reasons why the results have been mixed in previous studies examining whether there is a gender difference in sociotropy. For example, Welcowitz et al. (1985) suggested that scores on subjective masculinity and femininity, rather than genotypic sex, are correlated with gender differences. In their study, participants' scores on Bem's Sex Role Inventory (Bem 1974), rather than genotypic sex, were linked to two constructs which bear similarity to sociotropy: dependency and self-criticism (Welcowitz et al. 1985). Prince (1999), in an unpublished dissertation study, tested the hypothesis that the gender role adopted by an individual determines differences on sociotropy. Their study did not find an overall gender difference in sociotropy, but lesbian women in the study reported significantly lower sociotropy scores than did heterosexual women. Because studies that investigate the gender difference in sociotropy typically do not typically measure sexual orientation, gender role identification, and non-binary gender identification, the present meta-analysis cannot speak to whether these constructs moderate the gender difference in sociotropy.

Practice Implications

Researchers generally agree that there is a gender difference in depression, with females about twice as likely as males to suffer from depressive episodes and females experiencing about twice as many depressive symptoms as males (Girgus and Yang 2015; Parker and Brotchie 2010; Piccinelli and Wilkinson 2000; Salk et al. 2017). Research on factors that predict the gender gap in depression, such as interpersonal orientation, poverty, and stress, shows that this gender difference is overdetermined (for reviews, see Girgus et al. 2017; Hyde et al. 2008; Nolen-Hoeksema 2001). This suggests that individuals, particularly women, who are experiencing depression may be doing so for different reasons or combination of reasons. Identifying potential reasons through research will hopefully help clinicians and others screen for potential processes that might be at work in individual instances. For example, understanding sociotropy as a personality correlate for depression may guide clinicians to tailor selective interventions (e.g., interpersonal therapy, coping skills training) to the needs of patients. In addition, our finding that the gender difference in sociotropy varies by the degree of individualism/collectivism at the country-level suggests that more cross-cultural research in mental health and culturally attuned diagnosis and treatment is needed in the future (Cheung and Park 2010; Mak et al. 2011; Su et al. 2013).

Conclusions

The present research raises questions of how the gender difference in sociotropy is linked to depression. Researchers have posited that sociotropy, among other variables, plays a role in explaining the gender difference in depression (Girgus and Nolen-Hoeksema 2006). However, it was previously

unknown whether a gender difference in sociotropy existed and to what extent. The present meta-analytic review confirms that a small-to-moderate ($d = .34$) gender difference in sociotropy does indeed exist for sociotropy, with women scoring higher on sociotropy than men. This gender difference is moderated by participants' cultural context. These findings should provide grounding for future studies to examine why cultural contexts heighten or attenuate this effect, how sociotropy changes over the lifespan, and what implications the gender difference in sociotropy has for understanding processes leading to the gender difference in depression.

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Compliance with Ethical Standards

In conducting this meta-analysis, we have complied with APA ethical standards. The meta-analytic data in this manuscript has not been published, previously.

Conflict of Interest We declare no conflicts of interest.

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