Gender-Related Differences in Hypnosis-Based Treatments for Smoking: A Follow-up Meta-Analysis

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Abstract

In an earlier meta-analysis of 12 studies using hypnosis-based treatments for smoking cessation, we provided preliminary evidence that males fare better than females when trying to quit smoking (Green, Lynn, & Montgomery, 2006). By excluding studies that reported no gender differences, but failed to report final outcome-statistics-by-gender, our previous conclusion may have overestimated the role of gender in hypnosis-based smoking cessation treatment. In the present analysis, we included 12 additional studies that reported no gender differences, but failed to report final outcome-by-gender statistics. Across each of these studies, we calculated identical success rates for male and female participants and then added these results to our database. Among all 24 groups of participants who completed hypnosis-based treatment for smoking, we found a small but significant effect for male participants being more successful in quitting smoking relative to females. Specific suggestions for tailoring hypnosis smoking cessation programs to take gender differences into account are discussed.

Keywords: Smoking, gender differences, meta-analysis.

Smoking continues to be the leading cause of preventable morbidity and mortality in the United States (USDHHS, 2004). The Center for Disease Control (CDC) reported that nearly a quarter of Americans (22.5%) smoked in 2002 (CDC, 2004). Although a higher percentage of males (25.2%) than females (20.0%) report that they smoke on a daily basis or at least on “some days” (CDC, 2004), 50.9% of...
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men and 46.1% of women who had ever smoked have quit (USDHHS, 2001). The 2001 USDHHS report acknowledges that there is some evidence that women are less successful than men in trying to stop smoking, specifically when gender-related outcomes following nicotine replacement therapies (NRT) are compared. However, the report concludes that the evidence is not convincing. "Since the late 1970s or early 1980s, the probability of attempting to quit smoking and to succeed has been equally high among women and men" (USDHHS, 2001, p. 142). This declaration contradicts an earlier Surgeon General’s report that concluded that “women have more difficulty giving up smoking than men” (USDHHS, 1980, p. 307).

Whereas the USDHHS downplays the role of gender in predicting smoking cessation outcome, others disagree. Using comparable birth cohorts, Escobedo and Peddicord (1996) found smoking quit rates among women to be lower than those for men. Research by Fiore et al. (1994) and Wetter et al. (1994) similarly concluded that women seeking treatment for smoking have a more difficult time achieving abstinence than men. Other reviews have also concluded that women are less successful in achieving smoking abstinence and are more likely to relapse than are men (e.g., Blake et al., 1989; Swan, Ward, Jack, & Javitz, 1993). Summarizing the effectiveness of NRT among male and female smokers, Perkins (1999) concluded, “...women have slightly or significantly poorer outcome in nearly every clinical outcome study of nicotine replacement that presented outcome separately for men and women... In no study did women have a significantly better outcome than men” (p. 295).

Results from a study by Wetter et al. (1999) illustrate gender-related differences in smoking cessation outcome. Across three randomized, double-blind, placebo-controlled studies on the effectiveness of the nicotine patch involving over 600 participants, Wetter et al. (1999) found that males had higher success rates than women after 1 week of treatment (42% vs. 32%), at the end of treatment involving 8 weeks of counseling (45% vs. 29%), and at 6 months follow-up (25% vs. 12%). Males were more successful than women in achieving smoking abstinence regardless of whether they received an active nicotine patch, a placebo patch, individual counseling, or group counseling. Wetter et al.’s (1999) findings are compatible with other studies that have shown that NRT appears less effective with women than men (Hatsukami, Skoog, Allen, & Bliss, 1995; Killen, Fortmann, Newman, & Varady, 1990; Perkins et al., 1996).

Unfortunately, the hypnosis literature has paid relatively little attention to gender in predicting smoking cessation. Green and Lynn’s (2000) review of 59 studies that employed hypnosis or suggestion-based interventions for smoking cessation indicated that hypnosis was typically found to be superior to wait-list or no-treatment controls, and many studies found hypnosis to be at least as effective as alternative treatments such as acupuncture, relaxation, and attention placebo. Whereas Green and Lynn concluded that hypnosis was a promising treatment that was possibly efficacious, using criteria set forth by the American Psychological Association’s task force on empirically validated treatments (Chambless & Hollen, 1998), they also noted that it was premature to regard hypnosis as a specific and efficacious treatment for smoking cessation. The conclusion was compatible with other reviews (e.g., Abbot, Stead, White, & Barnes, 2004) that have urged caution in interpreting the findings in this research area, particularly because many of the studies rely exclusively on self-report and are not randomized controlled trials that permit isolating the specific effects of hypnosis from other interventions.

Meta-analysis is a statistical method for combining the results of several studies within a research area by placing them on the same metric and then estimating the overall magnitude of a treatment-related effect (i.e., an effect size) across these studies. By combining outcome data across multiple studies, analyses of effect sizes can provide a better understanding of cumulative research findings for an area than narrative review articles (Hunter & Schmidt, 1990). For example, the combining of participant data across studies increases overall statistical power for detecting
a significant effect beyond what can typically be accomplished in an individual study. One important concern with meta-analytic approaches is that only published studies (or those known to the authors) can be included in the analysis. Non-significant studies are less likely to be published and are, therefore, more apt to be left in the file drawer (Rosenthal, 1979). This so-called file drawer bias led Rosenthal (1979, 1984) to develop the fail-safe N statistic. The fail-safe N reflects the number of studies with null findings that are needed to reduce the obtained effect size to a non-significant level. If the fail-safe N is small, indicating that the addition of only a small number of studies with null findings would reduce the meta-analytic finding to a non-significant level, then the results of the meta-analysis should be viewed with caution (Rosenthal, 1979).

It is important to note that the purpose of the fail-safe N is to estimate the number of hypothetical studies with null findings that would be needed to transform an observed effect that is significant to one that is no longer significant. While conducting our literature search for our earlier meta-analysis, we found an additional 12 studies that employed hypnosis or suggestion-based approaches to smoking cessation and that specifically examined whether gender acted as a moderating variable on successful smoking cessation. These 12 studies were not included in our earlier review, however, because they did not provide outcome data broken down by gender. Although the exclusion of these studies was justified based on our study-inclusion-criteria, it is unsettling that our earlier finding that males tend to fare better than females following a hypnosis-based smoking cessation program was based on only half of the available published studies. Because the 12 studies that were not included in our earlier investigation reported no statistical differences in outcome due to gender, it is possible that our previously reported effect size (i.e., $ES_{LOR} = .31$) overestimated the true effect associated with being male versus female.

In order to include these additional 12 studies into a larger sample of smoking cessation studies, we needed to estimate the final outcome by gender effect across these studies. Given that there were no statistical differences due to gender within any of these studies, we decided to use each study’s overall success rate as the best estimate of the outcome-by-gender statistics. In other words, for these 12 studies, we set the success rate for female and male participants to be equivalent to the overall success rate. In addition to examining how the inclusion of these 12 null-finding studies affects the magnitude of the effect associated with being male, we were interested in contrasting the overall success rate among female and male participants across all 24 studies with the rates we reported in our earlier investigation.

In our previous meta-analysis of 12 published reports involving hypnosis-based treatments for smoking, we (Green, Lynn, & Montgomery, 2006) found evidence that male participants (31% overall abstinence rate) fared better than female participants (23% overall abstinence rate). The overall effect size (in logged odds ratio units) was $ES_{LOR} = .31$ ($p < .01$). The purpose of the present study was to determine whether the advantage of being male in hypnosis smoking cessation studies could be replicated when 12 additional null-finding studies are included in the sample of studies under meta-analytic review.

**Method**

Across 19 studies, we identified 24 separate samples of participants treated with a hypnosis-based intervention for smoking. Fourteen of these studies were included in the Green & Lynn (2000) review of the hypnosis literature for smoking cessation. Five additional studies were located through PSYCHINFO or were brought to the authors’ attention after publication of the Green and Lynn (2000) review. Green, Lynn, and Montgomery (2006) examined the results of 12 of these studies in their meta-analysis (see Table 1). To be included in this review, each study was required
Table 1: Abstinence Rates Across Hypnosis-Based Smoking Cessation Studies and the Effect Size of Being Male

<table>
<thead>
<tr>
<th>Study</th>
<th>Treatment Format</th>
<th>Hours</th>
<th>N</th>
<th>Follow-up (mos)</th>
<th>Abstinent (Total)</th>
<th># Abstinent/Totals (%)</th>
<th>Log Odds Ratio (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ahijevych &amp; Nedelski, 2000</td>
<td>H G</td>
<td>1</td>
<td>452</td>
<td>5-15</td>
<td>22</td>
<td>54/269 (20%)</td>
<td>47/183 (26%)</td>
</tr>
<tr>
<td>Barber, 2001</td>
<td>HRS I</td>
<td>5-17</td>
<td>54</td>
<td>6-36</td>
<td>87</td>
<td>25/30 (83%)</td>
<td>22/24 (92%)</td>
</tr>
<tr>
<td>Elkins &amp; Rajab, 2004</td>
<td>H I</td>
<td>2-3</td>
<td>21</td>
<td>12</td>
<td>33</td>
<td>5/9 (56%)</td>
<td>5/12 (42%)</td>
</tr>
<tr>
<td>Grosz, 1978††</td>
<td>H I</td>
<td>1</td>
<td>479</td>
<td>3</td>
<td>44</td>
<td>123/277 (44%)</td>
<td>88/202 (44%)</td>
</tr>
<tr>
<td>Hart, 1992††</td>
<td>H G</td>
<td>1.25</td>
<td>33</td>
<td>1</td>
<td>67</td>
<td>16/25 (64%)</td>
<td>6/8 (75%)</td>
</tr>
<tr>
<td>Horwitz et al., 1985††</td>
<td>H G</td>
<td>1.5</td>
<td>219</td>
<td>12</td>
<td>26a</td>
<td>31/149 (21%)</td>
<td>25/70 (36%)</td>
</tr>
<tr>
<td>Johnson &amp; Karkut, 1994</td>
<td>HRS I</td>
<td>7</td>
<td>186</td>
<td>3</td>
<td>86</td>
<td>81/93 (87%)</td>
<td>80/93 (86%)</td>
</tr>
<tr>
<td>Kline, 1970††</td>
<td>HIG G</td>
<td>12</td>
<td>60</td>
<td>12</td>
<td>88</td>
<td>10/10 (100%)</td>
<td>43/50 (86%)</td>
</tr>
<tr>
<td>Marriott &amp; Brice, 1990</td>
<td>H I</td>
<td>1</td>
<td>34</td>
<td>3</td>
<td>29</td>
<td>8/23 (35%)</td>
<td>2/11 (18%)</td>
</tr>
<tr>
<td>Owens &amp; Samaras, 1981††</td>
<td>H G</td>
<td>1</td>
<td>466</td>
<td>6-9</td>
<td>27a</td>
<td>63/269 (23%)</td>
<td>65/197 (33%)</td>
</tr>
<tr>
<td>Sorensen et al., 1995††</td>
<td>H G</td>
<td>1.5</td>
<td>2,642</td>
<td>12</td>
<td>16a</td>
<td>239/1717 (14%)</td>
<td>179/925 (19%)</td>
</tr>
<tr>
<td>Straatmeyer, 1984</td>
<td>HCS I</td>
<td>2</td>
<td>108</td>
<td>9</td>
<td>22</td>
<td>14/64 (22%)</td>
<td>10/44 (23%)</td>
</tr>
</tbody>
</table>
Table 1: Abstinence Rates Across Hypnosis-Based Smoking Cessation Studies and the Effect Size of Being Male (con’t)

<table>
<thead>
<tr>
<th>Study</th>
<th>Treatment Type</th>
<th>Format</th>
<th>Hours</th>
<th>Follow-up (mos)</th>
<th>Abstinent #</th>
<th>Male</th>
<th>Female</th>
<th># Abstinent/Totals (%)</th>
<th>Log Odds Ratio</th>
<th>ES</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Studies reporting no gender differences but failing to report final outcome-by-gender statistics (estimations are in <em>italics</em>)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baer et al., 1986††</td>
<td>H</td>
<td>I</td>
<td>2</td>
<td>137</td>
<td>12</td>
<td>24</td>
<td></td>
<td>15.12/63 (24%)</td>
<td>17.76/74 (24%)</td>
<td>0.00</td>
<td>-0.79, 0.79</td>
</tr>
<tr>
<td>Barabasz et al., 1986(a)</td>
<td>H</td>
<td>I</td>
<td>2</td>
<td>128</td>
<td>9-17</td>
<td>23</td>
<td></td>
<td>14.26/62 (23%)</td>
<td>15.18/66 (23%)</td>
<td>0.00</td>
<td>-0.82, 0.82</td>
</tr>
<tr>
<td>Barabasz et al., 1986(b)</td>
<td>H</td>
<td>G</td>
<td>2</td>
<td>66</td>
<td>10</td>
<td>36</td>
<td></td>
<td>12.24/34 (36%)</td>
<td>11.52/32 (36%)</td>
<td>0.00</td>
<td>-1.01, 1.01</td>
</tr>
<tr>
<td>Barabasz et al., 1986(c)</td>
<td>H</td>
<td>I</td>
<td>3-5</td>
<td>20</td>
<td>17</td>
<td>30</td>
<td></td>
<td>3.00/10 (30%)</td>
<td>3.00/10 (30%)</td>
<td>0.00</td>
<td>-1.91, 1.91</td>
</tr>
<tr>
<td>Barabasz et al., 1986(d)</td>
<td>H</td>
<td>HRES</td>
<td>I</td>
<td>3-5</td>
<td>30</td>
<td>19</td>
<td>47</td>
<td>7.05/15 (47%)</td>
<td>7.05/15 (47%)</td>
<td>0.00</td>
<td>-1.43, 1.43</td>
</tr>
<tr>
<td>Barabasz et al., 1986(e)</td>
<td>H</td>
<td>HCS</td>
<td>I</td>
<td>3-5</td>
<td>47</td>
<td>4</td>
<td>4</td>
<td>0.96/24 (4%)</td>
<td>0.92/23 (4%)</td>
<td>0.00</td>
<td>-2.92, 2.92</td>
</tr>
<tr>
<td>Bayot et al., 1997</td>
<td>ESR</td>
<td>I</td>
<td>7-9</td>
<td>66</td>
<td>6</td>
<td>38</td>
<td></td>
<td>13.30/35 (38%)</td>
<td>11.78/31 (38%)</td>
<td>0.00</td>
<td>-1.00, 1.00</td>
</tr>
<tr>
<td>Holroyd, 1991(a)</td>
<td>H</td>
<td>I</td>
<td>2-4</td>
<td>52</td>
<td>6-12</td>
<td>16</td>
<td></td>
<td>4.16/26 (16%)</td>
<td>4.16/26 (16%)</td>
<td>0.00</td>
<td>-1.48, 1.48</td>
</tr>
<tr>
<td>Holroyd, 1994(b)</td>
<td>H(ET)</td>
<td>I</td>
<td>2-4</td>
<td>39</td>
<td>6-12</td>
<td>16</td>
<td></td>
<td>3.04/19 (16%)</td>
<td>3.20/20 (16%)</td>
<td>0.00</td>
<td>-1.71, 1.71</td>
</tr>
<tr>
<td>Jeffrey &amp; Jeffrey, 1988</td>
<td>HET</td>
<td>G</td>
<td>5.5</td>
<td>120</td>
<td>3</td>
<td>37</td>
<td></td>
<td>16.65/45 (37%)</td>
<td>27.75/75 (37%)</td>
<td>0.00</td>
<td>-0.77, 0.77</td>
</tr>
<tr>
<td>Sanders, 1977</td>
<td>H</td>
<td>G</td>
<td>6</td>
<td>19</td>
<td>10</td>
<td>68</td>
<td></td>
<td>6.80/10 (68%)</td>
<td>6.12/9 (68%)</td>
<td>0.00</td>
<td>-1.93, 1.93</td>
</tr>
<tr>
<td>Spiegel et al., 1993</td>
<td>H</td>
<td>I</td>
<td>1</td>
<td>226</td>
<td>12</td>
<td>25</td>
<td></td>
<td>29.5/118 (25%)</td>
<td>27.0/108 (25%)</td>
<td>0.00</td>
<td>-0.60, 0.60</td>
</tr>
</tbody>
</table>

*Treatment Key:* H - hypnosis was the principle intervention strategy (e.g., hypnotic suggestions to resist smoking urges; visualizing self as a nonsmoker and/or mentally rehearsing behavioral substitution during hypnosis); HRS - hypnosis combined with rapid smoking; HCS - hypnosis combined with covert sensitization (e.g., noxious imagery of smoking and associated negative health effects); ESR - emotional self-regulation therapy involving suggestions to resist smoking urges without labeling the treatment as hypnosis; HIG - hypnosis combined with intensive group counseling; HET - hypnosis plus exclusion therapy (participants were required to stop smoking 48 hours prior to treatment); H(ET) - hypnosis and a non-mandatory request to quit smoking 24 hours prior to treatment. HRES - hypnosis plus restricted environmental stimulation therapy.

†† Did not include dropouts as failures.

*Notes:* For each of the studies listed in the bottom half of Table 1, we estimated abstinence frequencies by multiplying the number of male and female participants in each study by the reported overall abstinence rate (numbers in *italics* indicate estimations). Each of these articles specifically reported that abstinence rates did not differ by gender but they did not report final outcome-by-gender statistics. Multiple treatment groups were reported in the original Barabasz et al. (1986) and Holroyd (1991) articles. Outcome statistics for the Barber (2001) study were updated since the published report (Barber, personal communication, November 1, 2004). Gender statistics for the Ahijevych & Nedelski (2000), Elkins & Rajab (2004), and Hart (1992) studies were obtained from the authors (personal communications: Ahijevych, March 18, 2002; Elkins, May 7, 2004; and Hart, May 5, 2004).

The top portion of this Table was reprinted with permission of the International Journal of Clinical and Experimental Hypnosis (Green, Lynn, & Montgomery, 2006).
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to have (a) used hypnosis as a component of treatment, (b) reported the number of females and males in the treatment sample, and (c) specifically analyzed for gender differences during the assessment of outcome.

Across each of the 24 reports, abstinence was defined as total abstinence from smoking between the end of treatment and follow-up. Whenever possible, based on information provided in the article, we recalculated abstinence rates for each study to include dropouts as failures. As noted previously, final outcome-by-gender statistics were not reported for 12 of the treatment groups. For these cases, abstinence rates for female and male participants were estimated by multiplying the number of female and male participants in the study by the overall abstinence rate that was reported in the original study. This approach is conservative in that the success rates that we used across these studies were exactly the same for male and female participants (see Table 1).

The treatment format, overall N, success rates by gender, and the natural log of the odds ratio for each of the 24 comparison samples are provided in Table 1. Following the recommendations by Lipsey and Wilson (2001) and consistent with how we conducted our previous meta-analysis (Green, Lynn & Montgomery, 2006), we calculated a mean effect size (ES) across reports by weighting each $ES_i$ by the inverse variance ($w$); we performed z-tests to determined the significance of the mean effect size; and, we performed a homogeneity test (i.e., $Q$ statistic) on the distribution of the effect sizes to determine if all of the effect sizes estimated the same population effect.

In order to calculate the number of null-finding studies that would be needed to reduce any obtained effect size to a value that was no longer significant at the $p < .05$ level, we used Rosenthal’s (1979) ‘fail-safe N’ formula:

$$X = (k/2.703) [k(Z_k)^2 - 2.703],$$

where $X$ is the fail-safe N; $k$ is the number of studies in the meta-analysis; and $Z_k$ is the average z-score across the $k$ studies. In order to calculate a z-score for the effect size associated with each study, we divided the $ES_{LOR}$ by the standard error ($SE_{LOR}$).

Results

Across all 24 reports, a total of $N = 5,704$ individuals participated in hypnosis-based treatment for smoking cessation. Collapsing across all of the studies, 26.3% of the entire sample reported being completely abstinent from smoking at follow-up. A total of 23.4% of the female participants and 30.6% of the male participants reported achieving smoking abstinence, $X^2(1: N = 5,704) = 37.12, p < .001$. As we reported in our previous review (Green, Lynn & Montgomery, 2006) only 3 studies reported significant gender differences (i.e., Horwitz, Hindi-Alexander, & Wagner, 1985; Owens & Samaras, 1981; Sorensen, Beder, Prible, & Pinney, 1995) and in each case, male participants were more successful than females.

Meta-analyses findings. When we meta-analyzed all 24 reports listed in table 1, we obtained a $ES_{LOR} = 0.25$ ($ES_L = 0.12; ES_U = .38$), $z = 3.78, p < .01$. The corresponding mean odds ratio was $ES_{OR} = 1.29$ (95% confidence intervals = 1.13 and 1.47). When we included all of the 15 studies listed in table 1 whose principle treatment was hypnosis, we obtained a $ES_{LOR} = 0.28$ ($ES_L = 0.15; ES_U = .42$), $z = 4.01, p < .01$. The corresponding mean odds ratio was $ES_{OR} = 1.33$ (95% confidence intervals = 1.16 and 1.53). In both analyses, the homogeneity test was non-significant, $Qs = 13.83$ and 10.48, respectively.
Given that one of the few studies to find an advantage of being male also had the largest sample among our studies, we recalculated the above two effect sizes excluding the Sorensen et al. (1995) study to determine if this study had an undue influence on our results. Even when data from the Sorensen et al. (1995) study was excluded, we continued to find an advantage for male participants, $ES_{LOR}$ ranged from 0.17 to 0.20, all $p$s < .05. Removing the Sorensen et al. (1995) study had the effect of increasing the overall success rate to 35.4% among both male and female participants.

**Correlational analyses.** Across all 24 studies, the overall success rate correlated with the number of hours of treatment (i.e., treatment intensity), $r = .72$, $p < .01$; but not the length of follow-up, $r = -.09$. When only the 15 studies whose principle treatment was hypnosis were analyzed, treatment intensity ($r = .29$) and length of followup ($r = -.31$) failed to significantly correlate with outcome ($p$s > .05) but both correlations were in the predicted direction. Across both sets of these correlations, there were no gender differences (all $z$ transformation of $r$ tests were less than 0.10; $p$s > .05).

**Fail-Safe N Calculation.** We obtained an average $z$-score of 0.385 across the 24 studies. Using Rosenthal’s (1979) formula, an additional $X=7.53$ studies would be needed to reduce the obtained finding ($ES_{LOR}=.25$, $p < .01$) to a value that was no longer significant at the $p < .05$ level.

**Discussion**

The results of our current review strengthened our earlier finding that there is a link between gender and outcome when employing hypnosis-based treatments for smoking cessation. When data across all 24 reports were combined (involving over 5,700 treatment participants), an appreciable advantage for males emerged. Roughly 31% of male participants, compared with 23% of female participants, reported achieving smoking abstinence following treatment. Male participants were 1.29 times more likely to abstain from smoking following hypnosis-based treatment compared to female participants. This effect was evident even after we estimated equivalent male and female success rates across the 12 studies that analyzed for gender differences, but failed to report final outcome statistics by gender. When we only included the studies whose principle treatment was hypnosis ($N=15$ studies), we obtained a similar odds ratio of 1.33 in favor of male participants being more successful relative to female participants.

Our findings are consistent with our previous results based on 12 studies that provided final outcome-by-gender statistics (Green, Lynn, & Montgomery, 2006). In our earlier investigation, we obtained an odds ratio of 1.37 suggesting that male participants (31.4% overall success rate) were more successful achieving smoking abstinence than female participants (22.8% overall success rate). Whereas the inclusion or exclusion of the Sorensen et al. (1995) study did not affect the principal finding that males are more likely to succeed in hypnosis-based treatments for smoking cessation, the study influenced the overall abstinent rate reported in this review. Across all 24 studies, the average success rate was 26.3% among male and female participants (this finding was consistent with the overall success rate based on the 12 studies that provided final outcome data by gender). When we excluded data from the Sorensen et al. (1995) study, the average success rate increased to 35.4%. In our previous paper, we (Green, Lynn, & Montgomery, 2006) discussed the Sorensen et al. (1995) study in some detail and speculated as to why they obtained a relatively low success rate.

An additional 8 studies that failed to find gender differences would be needed to reduce our obtained effect size to a level that is no longer significant. While this number is not impressively large, it is important to point out that these hypothetical studies would
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need to mirror the average number of participants existing in our dataset of 24 studies. That
is, each of these hypothetical studies would need to average 238 participants in order to
eliminate the significant effect associated with being male. Given the scientific and clinical
interest in the outcome of such relatively large-scale studies using hypnosis for smoking
cessation, it seems unlikely, we believe, that 8 studies involving this many participants have
not been published or discussed at professional meetings and have instead been relegated
to a file drawer.

Whereas only one of the correlational analyses was statistically significant, results
were in the direction of higher success rates among those studies employing more intensive
treatments and, not surprisingly, those using relatively shorter follow-up periods. Although
recidivism rates tend to reach asymptotic levels about 6 months post treatment (Spiegel,
Frischholz, Fleiss, & Spiegel, 1993), the surgeon general has argued that a 2-year follow-up
is optimal for assessing long term maintenance (USDHHS, 1990).

In summary, our present findings strengthen our previous claim that male
participants appear to fare better than female participants in hypnosis-based smoking
cessation programs. We have now included 24 studies that have examined gender as a
potential variable affecting smoking cessation outcome. Even when we conservatively
calculated identical success rates for male and female participants across the studies that
reported no gender differences, but failed to provide final outcome-by-gender statistics, an
appreciable advantage for male participants emerged.

Our findings imply that clinicians would do well to attend to a number of gender-
related considerations in implementing hypnosis-based smoking cessation treatments. A small
number of studies have reported an association between gaining weight and successfully
quitting following a hypnosis-based treatment for smoking (e.g., Baer, Carey, & Meminger,
1986; Barabasz, Baer, Sheehan, & Barabasz, 1986; Javel, 1980; Sheehan & Surman, 1982). Barabasz
et al. (1986), in what appears to be the only hypnosis-based study to find a gender-based
difference in weight gain following treatment, reported that among those who were abstinent
from smoking at 6-months follow-up, women gained more weight ($M = 13.2$ lbs.) than men ($M =
6.4$ lbs.). Relatedly, Johnson and Karkut (1994) reported that women verbalized more concerns
than men about gaining weight following a hypnosis smoking cessation treatment.

These findings suggest that women who are especially fearful of gaining weight
may be reluctant to stop smoking. Accordingly, clinicians should encourage women in
treatment to: a.) develop self-esteem, b.) adopt more flexible body image standards, and c.)
tolerate small increases in weight (Green, 2000). Regardless of whether treatment is conducted
on an individual or group basis, the therapist should administer suggestions that magnify
negative images of smoking and the health benefits of smoking cessation, and prepare
women to experience an increase in appetite and engage in a regular exercise regimen (e.g.,
walking 15 minutes a day). We recommend that the therapist discuss with the client that any
minor weight gain is a worthwhile trade-off for relinquishing a dangerous habit.

Barabasz et al.’s (1986) study of hypnosis and smoking cessation reported a negative
correlation between depressive symptoms and abstinence. This research, taken together with
the findings that smokers are four times as likely to experience depression as nonsmokers
(Glassman et al., 1988), that women are twice as likely to experience depression compared with
men (Blazer, Kessler, McGonagle, & Swartz, 1994), and that women are more likely to experience
depression during nicotine withdrawal (Brandon & Baker, 1991), all point to the need to incorporate
interventions for managing negative affect into hypnosis-based smoking cessation treatments
(Acierno, Kilpatrick, Resnick, Saunders, & Best, 1996; Borrelli, Bock, King, Pinto, & Marcus,
Green, Lynn, Montgomery 1996). Moreover, it is prudent for therapists who conduct individual smoking cessation treatments to consider the benefits of using antidepressant medication for smoking cessation with patients who are vulnerable to negative mood states (Green, 2000).

Additionally, women (as well as men) should be encouraged to enact assertive behaviors that predict abstinence. For example, Horwitz et al. (1985) observed that individuals who object to others smoking around them and request non-smoking accommodations are more likely to achieve abstinence. Finally, there are indications in the literature (Pomerleau, 1996) that it may be best to defer initiating a smoking cessation treatment to a time when women are relatively free of acute menstrual distress (e.g., women with late luteal phase dysphoric disorder), given that such distress has been found to correlate with withdrawal discomfort (O’Hara, Portser, & Anderson, 1989).

In examining the 3 studies included in our review where gender differences surfaced, it is apparent that they were all single session studies, which did not address weight-related issues or other concerns that may account for gender differences. More intensive programs that deal with these issues would be expected to equalize treatment outcomes across gender and maximize treatment gains overall.

There are several limitations to our present study. First, because the actual data points were not available, we used the overall abstinence rate as our best estimate of the success rate among female and male participants across half of the studies included in this meta-analysis. Our obtained effect size, therefore, should be viewed only as a rough estimate. However, because we calculated equivalent outcome-by-gender rates across half of the studies and still found an appreciable effect associated with being male, it seems that our previously reported finding that males tend to fare better than females in hypnosis-based smoking cessation programs is robust. The actual magnitude of this effect may, in fact, be stronger than what we currently have estimated due to our conservative approach. Indeed, the author of five of the studies included in our database communicated to us that while the actual data points are no longer available, the trend across these studies was for males to be more successful than females (A. Barabasz, personal communication, September 20, 2007). Given that this communication addresses nearly half of the studies that we had estimated equivalent outcomes, it seems probable that our obtained effect size may be a low-end estimate of the actual effect.

It is evident from this review that the vast majority of studies examining the efficacy of hypnosis-based approaches to smoking cessation rely on clinical reports. If more than one treatment approach was used, random assignment of patients to condition was not implemented. As such, demographic characteristics such as age, education level, motivation, smoking history, social support, and previous quit attempts were not taken into consideration when gender differences in outcome were considered. Combining data across studies that varied in length of follow-up may also be questionable as it is likely that shorter follow-up periods will have higher success rates.

We wish to point out that all of the studies in this review used self-report measures of quitting smoking. The failure to use biochemical measures to validate self-reports of smoking abstinence is a shortcoming typical of most hypnosis-based treatments for smoking (Green & Lynn, 2000). Researchers should report gender differences across all dependent measures as well as across pretreatment measures such as motivation and demographic variables thought to moderate or mediate treatment success.

Future studies should either match female and male participants on important demographic variables or statistically control for such variables in order to isolate the effect of gender on hypnosis-based treatments for smoking. In sum, it seems that the current hypnosis literature is consistent
with much of the non-hypnosis literature in that males may have an easier time quitting smoking relative to females.

References


Gender-Related Differences


Green, Lynn, Montgomery


*References marked with an asterisk indicate studies included in the meta-analysis.

Author Notes
We would like to thank Rouhangiz Rasekhy for her assistance with data collection.

Footnotes
1There are three possibilities within each of these studies that could result in a non-significant difference between female and male participants. One, males could have been more successful than females, p > .05. Two, females could have been more successful than males, p>.05. Or, three, the rates were exactly identical. Given our previous finding that across 12 hypnosis-based smoking cessation studies males tended to be more successful than females (Green, Lynn & Montgomery, 2006), and that the same trend is found in several non-hypnosis reviews of the smoking cessation literature (reviewed earlier), we reasoned that a non-significant trend in favor of females faring better than males is unlikely. It is certainly possible, and arguably probable, based on the aforementioned lines of evidence, that the trend across the 12 studies is question was that male participants fared better than female participants (see personal communication from A. Barabasz noted in the Discussion). Without the actual data points, however, we felt that the best course of action was to be conservative and to generate equivalent outcome rates. This approach, then, allowed us to determine the impact of adding these 12 studies with estimated equivalent outcomes on our previously-reported effect size.
2If a study reported a range in the number of treatment hours, we used the highest value for calculating the correlation coefficient. For studies reporting a range in follow-up assessment, we used the shortest follow-up period in the correlational analyses.