Perceived Effectiveness and Risk of Sexual Orientation Change Efforts (SOCE):

Perspectives of a US Sample of 125 Male Clients

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Abstract

Background: Voluntary therapeutic interventions to reduce unwanted same-sex sexuality are collectively known as sexual orientation change efforts (SOCE). Currently almost all evidence addressing the contested question whether SOCE is effective or safe consists of anecdotes or very small sample qualitative studies of persons who currently identify as sexual minority and thus by definition failed to change. We conducted this study to examine the perceived effects and risk outcomes for a group of SOCE participants unbiased by current sexual orientation.

Methods: We examined a convenience sample of 125 men who had undergone SOCE for homosexual-to-heterosexual change in sexual attraction, identity and behavior, and for positive and negative changes in psychosocial problem domains (depression, suicidality, self-harm, self-esteem, social function, and alcohol or substance abuse). Mean change was assessed by parametric (t-test) and nonparametric (Wilcoxon sign rank test) significance tests.

Results: Exposure to SOCE was associated with significant declines in same-sex attraction (from 5.7 to 4.1 on the Kinsey scale, $p < .000$), identification (4.8 to 3.6, $p < .000$), and sexual activity (2.4 to 1.5 on a 4-point scale of frequency, $p < .000$), with large effect sizes ranging from .56 to .94 (Cohen's d). From 45% to 69% of SOCE participants achieved at least partial reduction of unwanted same-sex sexuality; full reduction was achieved by 14% for sexual attraction and identification, and 26% for sexual behavior. Rates were higher among married men, but 4-10%

of participants experienced increased same-sex orientation after SOCE. From 0.8% to 4.8% of participants reported marked or severe negative psychosocial change following SOCE, but 12.1% to 61.3% reported marked or severe positive psychosocial change. Net change was significantly positive for all problem domains.

Conclusion: SOCE was perceived as an effective and safe therapeutic practice by this sample of participants. We close by offering a unifying understanding of discrepant findings within this literature and caution against broad generalizations of our results.

Keywords: sexual orientation change; psychosocial health; marriage; ex-gay

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Introduction

In 2009 the American Psychological Association released its report on *Appropriate Therapeutic Responses to Sexual Orientation* (American Psychological Association, Task Force on Appropriate Therapeutic Responses to Sexual Orientation., 2009), hereafter referred to as the Report), which attempted to summarize what could be definitively concluded from the existent scientific literature at that time. The Report concluded, "Thus, we cannot conclude how likely it is that harm will occur from sexual orientation change efforts (SOCE) (p. 42) and "Given the limited amount of methodologically sound research, we cannot draw a conclusion regarding whether recent forms of SOCE are or are not effective" (p. 83). The Report discouraged practices designed to facilitate change but fell short of recommending ethical or legal bans on any professional practices. Despite this internal restraint and external criticisms of the Report at the time (Jones et al., 2010), this document has weighed heavily in the escalating legal efforts to ban SOCE that have been waged in the past decade (e.g., APA, 2021). Currently (as of 2024) SOCE provided by licensed therapists have been legally prohibited for minors in 23 states and numerous municipalities in the United States (Movement Advancement Project | Conversion 'Therapy' Laws, 2024). Efforts to expand the scope of these bans to include adult consumers and non-licensed religious providers are currently underway (Ashley, 2019; Gamboni et al., 2018).

As recommended by the Report, further research has been undertaken in the intervening decade to accompany this regulatory and legal advocacy. The bulk of this literature has focused on potential harms from SOCE exposure, which has formed the basis for all legal prohibitions to date. Dehlin and colleagues reported a low likelihood of SOCE success and concluded that sexual orientation is highly resistant to purposeful attempts at modification (Bradshaw et al., 2015; Dehlin et al., 2015). They did find, however, that SOCE in the context of psychiatry and psychotherapy was reported to be moderately to highly effective by 48% and 44% of sample consumers, respectively, although this reported outcome did not seem to be based on experiences of actual change. More recent studies have reported SOCE exposure to be associated with poorer mental health indicators, including higher suicidality, among sexual minority youth (Ryan et al., 2020), adults (Blosnich et al., 2020; Salway et al., 2020), and midlife and older adults (Meanley et al., 2020).

Despite the opposition to SOCE from professional and funding organizations, several studies have presented evidence validating change efforts. Nicolosi et al. (2000) first reported substantial, statistically significant change on multiple measures of sexual attraction in a retrospective sample of 880 SOCE clients. In 2003 Dr. Robert Spitzer, a notable supporter of the depathologization of homosexuality in the 1970s, published a landmark study based on structured interviews with 200 self-identified "ex-gays" which found that most of them experienced at least limited change of sexual orientation. Spitzer later questioned the credibility of these self-reports under pressure from gay activists, (Arana, 2012; Spitzer, 2012) prompting objection from several of his original study participants to reassert the veracity of their reports and challenge the impugning of their integrity (Armelli et al., 2012). Spitzer offered no evidence to support his change of opinion and the journal refused to retract the study (Spitzer, 2003). Karten and Wade (2010), examining a sample similar to the present one, found that men conflicted about their same-sex attractions who pursued SOCE reported, on average, a decrease in same-sex feelings and behavior, an increase in heterosexual feelings, and a positive change in their psychological functioning.

Two studies have found evidence of therapy-assisted change using a methodologically stronger prospective longitudinal design. In 2011 Jones & Yarhouse published the results of a 7-year prospective longitudinal study of religiously mediated SOCE following 63 participants. They reported statistically significant albeit modest decreases in same-sex attractions, infatuations, and fantasies, with a slim majority of participants indicating shifts toward heterosexual experience, with no evidence of average harm (Jones & Yarhouse, 2011). A more recent longitudinal study followed 75 men in therapist-facilitated SOCE over a period of at least six months, measuring outcomes with standardized questionnaires, and also found significant but modest decreases in same-sex attractions and increases in opposite-sex attractions, with significant improvements in well-being (Pela & Sutton, 2021).

In the present study, we intend to add to this literature by examining the SOCE experience of 125 religiously active men, an understudied subgroup of those exposed to SOCE. We sought to examine two questions: 1) Was participation in SOCE perceived by these consumers to be helpful in alleviating unwanted same-sex attraction, identification and behavior? 2) To what degree was SOCE exposure perceived to be psychologically harmful or beneficial?

Method

Participants

This study presents a secondary analysis of an online survey previously administered to a convenience sample of adults who had undergone therapeutic intervention to alleviate unwanted same-sex attraction. The survey was administered in 2011 pursuant to the Doctor of Psychology dissertation of Paul Santero (now Psy.D.) at Southern California Seminary (P. Santero, 2011). Following a pre-test with 17 respondents to validate survey items, participants were contacted through religious organizations and therapist networks who offered services including talk therapy, retreats, and support groups that serve this population. Usable surveys were completed by 158 respondents, consisting of 8 females and 150 males. Due to the sparse cell size, females could not be included in the present study. Of the 150 males, 125 responded from the United States, with an additional 25 responding from the United Kingdom, Brazil, Canada, Israel and other countries. Since the questions of interest in this study pertain to SOCE effects in U.S. culture, the present analysis was confined to the 125 male US cases. Demographic characteristics of the study sample are presented in Table 1.

Two goals of the original survey data collection were to determine “if the participants’ same sex attractions, thoughts and actions were diminished or changed to thoughts, feelings and behaviors towards the opposite sex”, and “if there were any helpful (or harmful) effects experienced due to therapy” (P. Santero, 2011, p. vii). These goals challenge the view of most scholarly psychological associations that SOCE is necessarily ineffective and harmful. An earlier analysis based on the original dissertation (P. L. Santero et al., 2018) was retracted on specious grounds unrelated to data quality (Linacre Quarterly, 2020), followed by a protest from one of the co-authors (Whitehead, 2019). A previous version of the current study (D. P. Sullins et al., 2021) was also retracted four years after publication on similarly specious grounds (F1000Research, 2025). Three other treatments of these survey data are also currently extant, including two analyses that addressed questions related to those of the present study (Schumm, 2022; D. P.

Sullins, 2024) and a commentary on research on controversial issues (Schumm & Crawford, 2023).

The original survey study and protocols were approved by the Southern California Seminary Institutional Review Board. Written informed consent was obtained from all study subjects prior to participation (P. Santero, 2011, p. 154). As a secondary analysis of pre-existing public data, the Catholic University of America Institutional Review Board has certified this study to be exempt from human subject ethical review under 45 CFR 46.101.

Measures

The questionnaire (archived at P. Sullins, 2025) included 77 items about issues relating to SOCE exposure. Batteries of items gathered detailed information on the perceived effects of different therapeutic interventions, techniques, and even theoretical orientation (e.g., cognitive behavioral, Rogerian, psychoanalytic, gestalt, humanistic or existential). The originating dissertation (P. Santero, 2011) contains an extensive description of all the survey questions and other methodological details, to which the interested reader is referred. The present study examines a limited subset of questions which are described below.

To measure perceived change or stability in sexual orientation, respondents were asked to indicate both at "six months before getting help" and "currently" how often they: 1) had homosexual sex; 2) experienced homosexual passionate kissing; 3) looked with lust or daydreamed about having homosexual sex; 4) desired romantic, emotional, homosexual intimacy; 5) had heterosexual sex; 6) experienced heterosexual passionate kissing; 7) looked with lust or daydreamed about having heterosexual sex; or 8) desired romantic, emotional, heterosexual intimacy. For these eight items "sex" was defined as "touching genitals, oral, anal, or vaginal intercourse". Response options, coded 1-5 for analysis, were "almost never", "yearly", "monthly", "weekly", and "almost daily". At the time of survey administration, 42% of participants were still pursuing SOCE and 58% had concluded their SOCE. Median time post-SOCE was approximately three years, a conservative estimate due to the highest response category being "more than five years."

Respondents were also asked to rate both their sexual attraction and sexual identity, six months before getting help and currently, on a modified Kinsey scale (Kinsey, Pomeroy, and Martin 1948) with response options, coded 1-7 for analysis, of "heterosexual", "almost entirely heterosexual", "more heterosexual than homosexual", "bi-sexual", "more homosexual than heterosexual", "almost entirely homosexual", and "homosexual". For the analysis of change in sexual identity, the first three categories were classified "heterosexual" and the last three "homosexual." On this grouping, rejection of homosexual identity was coded as a dichotomous variable contrasting men who reported "homosexual" identity both before and after SOCE (n = 48) with men who reported "homosexual" identity before SOCE but "heterosexual" identity after SOCE (n = 37).

To isolate the components of difference that may be of theoretical interest, we classified the range of self-perceived differences from those recalled before SOCE to those currently experienced after SOCE into four distinct outcome categories: higher same-sex difference, meaning that same-sex attractions, etc., were increased following SOCE; no difference; higher but not full heterosexual difference, indicating lower values short of full heterosexual orientation

after SOCE; and full heterosexual difference, which indicates that the respondent rated his attraction, etc., as "heterosexual" or "almost entirely heterosexual" following but not retrospectively prior to SOCE.

Analyses also made use of measures of marital status and motivation for change. Participants were asked to indicate their marital status currently and six months before getting help with their same sex attraction. The response options were single, married, engaged, divorced, separated, widowed, or other. These were coded into dichotomous variables contrasting married (1) with all other options (0).

A survey item also asked respondents "Why did you decided to try to change your same sex thoughts, feelings and behaviors?" with response options of: Religious beliefs (1), Desire to have biological children (2), Desire to marry a person of the opposite sex (3), Cultural pressure/acceptance (4), Family pressure/acceptance (5), Strengthen a current marriage (6), or Other (7). A total of 53.6% (95% CI 44.8, 62.2) of respondents selected "Religious beliefs," the most common response. This item was recoded into a dichotomous variable contrasting religious beliefs with all other motivations for seeking to change sexual orientation.

Another series of items related to psychosocial function asked respondents "As a result of your change efforts, [indicate] the positive (negative) changes you have noticed in the following areas". The areas were 1) self-esteem, 2) depression, 3) self-harmful behavior, 4) thoughts/attempts of suicide, 5) social functioning, and 6) alcohol and substance abuse. Response options were "none", "slightly", "moderately", "markedly", and "extremely so", which were numbered 1-5 on the survey instrument. An additional option of "not applicable" was numbered 0. For analysis the "none" and "not applicable" responses were combined into a base category coded 0, with the remaining options coded 1-4. These measures were adapted from Spitzer's (2003) seminal study of SOCE participants, which were in turn based on the themes developed in Shidlo & Schroeder's (2002) qualitative study of consumer-reported SOCE outcomes. Karten & Wade's (2010) study of a sample similar to the present one also employed the same questions, but only to ask about positive changes. The present data extended the inquiry to examine the possibility of both positive and negative changes.

For analysis, the measure of perceived negative change was subtracted from perceived positive change, to produce a single statistic indicating net change for each area, which could be positive or negative. To highlight outcomes of theoretical interest, in line with the classification of sexual orientation categories, "none" and "not applicable" were both coded zero, the "slight" and "moderate" categories were combined, as well as the "marked" and "extreme" categories, to comprise three categories showing no change, slight or moderate change, and marked or extreme change.

Analyses

Effects in the data were analyzed under the theoretical paradigm of classic elaboration analysis (Lazarsfeld, 1955), which examines and elaborates direct and indirect mean differences in survey data. Bivariate contrasts in the data were assessed for significance and magnitude using the t-test and Cohen's d statistics. To assure sufficient conformity with distributional assumptions for these measures (normality and interval scale), self-reported differences before and after SOCE were also initially assessed by a two-tailed sign test, which does not assume these characteristics of the data. The two tests reported closely similar results with no differences in hypothesis

assessment, albeit with trivially higher p-values for the t test (see Table 2), thereby assuring the practical accuracy of the t test results in these data.

Effect sizes, expressed as Cohen's d, reported differences in terms of standard deviation, and thus provided an indication of the magnitude of change or contrast which was comparable across differently scaled variables. The substantive interpretation of effect sizes is a matter of some disagreement and varies according to the variables being considered, however using benchmarks originally suggested by Cohen (1988), a d below .2 is generally interpreted as small, .3-.6 moderate, and above .8 as indicating a large effect. Analyses for the present study made use of SPSS 25 and Stata 18.

Both mean and component analyses found a net positive association of SOCE with perceived heterosexual change. To better interpret this relationship, we elaborated the association to determine the presence of moderating, confounding or suppressing effects over four additional variables of theoretical or methodological interest: marriage; motivating religious beliefs; rejection of homosexual identity; and whether therapy was still ongoing or had been completed or discontinued. We also examined the effect of SOCE participation on the integration of sexual orientation dimensions.

Results

Sample Characteristics

Table 1 presents the demographic characteristics of the sample. Compared to the U.S. population of men, the survey respondents were disproportionately white, Western, highly educated, affluent, and Mormon. Almost all (91%) of the sample was white. Over half (55%) lived in the Western United States. Fully 73% of respondents, or about twice the proportion of all Americans, reported having attained a Bachelor's degree or higher education. About 58% reported a household income above $50,000, which was just above the national median income ($49,445) in 2011.

The sample participants were much more likely to be unmarried but less likely to be divorced than U.S. men on average. Over half (53%) reported having never been married, about 20 percentage points higher than in the general population (not shown). At the same time, less than 5% were divorced or separated, only about a third the rate for the general population (not shown). Of the 41% of respondents who indicated that they were currently married, 35% had been married more than 25 years, about the same proportion as in the population at large.

A notable feature of the sample is the very high level of religious observance reported by the participants. Almost all of them (88%) reported attending religious services at least once a week, a proportion at least four times higher than the national average. One in twelve (8%) reported attending church every day; only 2% responded that they never or rarely went to church. Other demographic features also suggested a very high level of observance of religious norms regarding marriage and sexuality in the sample. As previously mentioned, despite a low rate of marriage, divorce was relatively rare in this group. Not a single unmarried sample member reported having any children, and only four of the 51 married persons in the sample did *not* have any children. The parents reported having an average of three children each, almost one child

higher than the U.S. average. These characteristics correspond to a group that strictly observes religious norms regarding worship, marriage and fertility within marriage.

The largest identified religious group was “Mormon” or “LDS” (Latter-Day Saints), which was indicated by just under a third (29%) of respondents. However, these were all write- in responses, as the response categories provided did not include “Mormon” or “LDS”. It is likely that many of the respondents who checked “Unspecified Christian”, which at 35% was much larger than this category usually is on such surveys, were also Mormon. If all or even a large proportion of those who indicated “Unspecified Christian” were Mormon, then Mormons comprised over half of the survey sample. The next most common religious group was “Non-denominational Christian” at 14%. Smaller proportions of respondents identified as Roman Catholic, Baptist, Methodist and Episcopalian. Notably, a tenth (9.8%) of the sample identified as Jewish, which is over four times the concentration of Jews in the general population.

Participants reported seeking various kinds of help for their conflicted sexuality. The most frequently used resources were religious support groups (81.5%) and pastoral counselors (70.2%), followed by same-sex retreats (62.1%), marriage or family counselors (61.3%), psychologists (57.3%), non-religious support groups (51.6%), psychiatrist (25.8%) and social workers (21.8%). Most participants utilized more than one of these means. As previously noted, 42% reported that they were still currently in therapy of some sort for same-sex attraction.

Perceived differences after SOCE

To examine differences in the dimensions of sexual orientation we compared the values reported to currently be the case with values retrospectively reported to be the case six months before beginning SOCE. For this and most subsequent analyses in this section, we also examine opposite-sex sex behavior as a fourth dimension of sexual orientation in addition to the standard dimensions of attraction, identification and same-sex sex behavior. More heterosexual values are lower, more homosexual higher. Table 2 presents the results.

Lower current values were reported for all four dimensions of sexual orientation—attraction, identification, same-sex behavior, and opposite-sex behavior. Reported mean sexual attraction dropped over nine tenths of a standard deviation (-.94), from 5.7 to 4.1, on the Kinsey scale. Same-sex identification dropped sex tenths (-.60) of a standard deviation. Homosexual sex activity dropped by over a half (-.56) of a standard deviation, and heterosexual sex activity rose by a quarter (.24) of a standard deviation. By the conventional interpretation of Cohen’s d, SOCE was perceived to have a large effect on same sex attraction, moderate effects on same sex identification and sexual activity, and a small effect on opposite sex sexual activity. Other self-reported aspects of sexual desire, including kissing, ideation, and a desire for romantic intimacy, were perceived to be significantly lower with regard to homosexual partners and higher with regard to heterosexual partners following exposure to SOCE.

Cronbach’s alpha coefficients for the four main paired before and after SOCE measures of sexual orientation used in the analysis of this section ranged from .68 to .83, indicating strong pre-post reliability that suggests an absence of significant bias. An alpha computed for all ten measures in Table 2 combined was .87, indicating a high degree of reliability among these measures of sexual orientation.

Table 3 reports the percentage of men whose experience reflected each of the four abovementioned difference categories of theoretical interest following SOCE: higher same-sex

difference (attractions, identification, same-sex behavior, or opposite-sex behavior); no difference; higher but not full heterosexual difference; and full heterosexual difference. This classification of outcomes enabled a more fine-grained examination of perceived differences associated with SOCE. A small proportion (4-10%) of respondents reported higher same-sex difference, and a substantial proportion (27-47%) perceived no difference, following SOCE. At the same time, a substantial proportion of participants reported lower (more heterosexual) values after SOCE for same-sex attraction (69%), identification (54%) same-sex behavior (45%), and opposite-sex behavior (19%). Full heterosexual difference was less common than higher but not full heterosexual difference for attraction (50% to 19%) and identification (35% to 19%), but more common for same-sex behavior (8% to 37%) and opposite-sex behavior (8% to 11%). Compared to attraction or identification, although fewer men reported any heterosexual difference at all in unwanted homosexual behavior (45% compared to 54% or 69%), almost twice as many reported full heterosexual difference on this dimension (37% compared to 19%).

Associations with Ongoing Therapy, Marriage, Religious Motivation and Homosexual Identity

To illustrate and better understand the differences in perceived sexual orientation from before to after SOCE in this sample, we observed the differences across categories of four potential moderating variables, interpreting the results according to elaboration theory (Lazarsfeld, 1955).

Ongoing Therapy

Just under forty-two percent (41.9%) of the respondents indicated that they were still in therapy for unwanted same-sex orientation. These men, in effect, were still undergoing SOCE, a tacit acknowledgement that in many cases their therapeutic goals had not yet been achieved, and at any rate SOCE was incomplete. Table 4 compares outcomes for these men with their counterparts who were no longer in SOCE therapy.

Having completed (or discontinued) therapy was consistently associated with higher heterosexual difference. This was not due to larger differences after SOCE in attraction, identification, and same-sex sex. For these dimensions, before and after values for those still undergoing therapy were no different or only slightly different than for those who had completed or otherwise discontinued therapy. The t-test of mean difference indicated no interaction of having completed SOCE with before and after SOCE differences on these dimensions. Both those still in therapy and those not currently in therapy reported a mean difference following SOCE of -1.6 in same-sex attraction, of -1.2-1.3 in identification, and of -.9 in homosexual sex. Those still in therapy, however, began with a higher (more homosexual) mean score on each of these dimensions, meaning that their current level of homosexual orientation was still higher than those who were no longer in therapy.

The men still in therapy reported only a trivial increase (.02) in opposite-sex sex from before beginning SOCE, as they recalled, compared to a moderate but statistically significant larger mean perceived difference for those no longer in therapy (.47). The t-test indicated a significant interaction, which was illustrated by the fact that nine in ten (89%) of those still in therapy reported no difference from before SOCE in opposite-sex sex activity, compared to only 63% of

those who had completed or discontinued therapy, another statistically significant difference. Under 6% of those continuing therapy, but over 15% of those who had completed it, reported full heterosexual difference on this dimension. These differences may indicate uncompleted therapeutic goals on the part of those continuing therapy.

Marriage

From the standpoint of the men in the sample, one of the most important indicators of perceived SOCE effectiveness may be its association with reduced unwanted same-sex activity which conflicted with the religious norms of their marriages. Table 5 tests this possibility, comparing respondents by their marital status prior to engaging in SOCE on the same range of outcomes as presented in Table 3.

As Table 5 shows, marriage was associated with significantly larger reported reduction in same-sex sexual activity, with only weak and inconsistent associations with reports on the other dimensions of sexual orientation. Compared to unmarried men, men married before SOCE reported a smaller reduction in same-sex attraction but a higher reduction in same-sex identification, although neither difference was statistically significant. For opposite-sex sex, marriage was a negative confounder (in Lazarsfeld's term): married men reported reduced opposite-sex sex after SOCE, compared to a significant increase for unmarried men, both outcomes the opposite of what was intended following SOCE.

Only for same-sex sexual activity did the men in the sample report a strong, statistically significant interaction of marriage with the desired reduction in same-sex orientation. Married men reported higher mean same-sex activity before SOCE but lower same-sex activity after SOCE than did unmarried men. Notably, over two thirds (68%) of married men, compared to less than half that proportion (31%) of unmarried men, reported full heterosexual difference on this dimension, meaning the complete or almost complete elimination of same-sex sexual activity. This was true, moreover, despite the fact that the married men reported significantly higher same-sex activity than did unmarried men prior to SOCE.

Religious Motivation

In response to reviewer suggestions, we examined in this revision the effect of religious motivation for SOCE. As already noted, when asked, "Why did you decide to try to change your same sex thoughts, feelings and behaviors?" 54% of the respondents indicated "religious beliefs." Table 6 compares the mean and component differences in sexual orientation after SOCE for the men who did and did not report being motivated by their religious beliefs.

As Table 6 reports, the men who were motivated to seek sexual orientation change by religious beliefs reported smaller perceived heterosexual difference before to after SOCE than those who were not so motivated. T-test results indicate this interaction to be significant for same-sex attraction and identification, though a similar but smaller difference between the two groups was also observed for both same-sex and opposite-sex sexual behavior. Men who did not report religious motivation reported a 1.4 effect size reduction in same-sex attraction following SOCE; the corresponding effect size for men who did report a religious motivation was only .9, a

difference of half a standard deviation. Men who were not religiously motivated men were over five times more likely to report full heterosexual difference after SOCE in attraction (33% to 6%), and less likely to report higher same-sex difference after SOCE (1.7% to 6.1%). They were also much more likely to report full heterosexual difference in identification (29% to 10%), and to report any before to after SOCE difference at all on every dimension except opposite-sex sex.

Religious motivation, in sum, was associated with a smaller perceived reduction in same-sex orientation following SOCE. Since the motivation for seeking to change one's sexual orientation must precede SOCE participation, elaboration theory would classify religious motivation as a negative confounder or partial suppressor variable on perceived change in sexual orientation following SOCE (Lazarsfeld, 1955).

Sexual Identity

Prior research has suggested that adopting a heterosexual rather than homosexual identity may positively moderate SOCE outcomes (Karten & Wade, 2010; Nicolosi, 1997). To examine this question, we compared differences before and after SOCE in sexual attraction, same-sex sex and opposite-sex sex over two groups: men who over the course of SOCE changed identity from homosexual to heterosexual, and men who retained a homosexual identity. Table 7 shows the results. A better comparison group would have been men who changed from heterosexual to homosexual identity, but this cell was too sparse (n=4); the table may therefore understate the pertinent differences.

Table 7 reports a strong, significant interaction of reduction in same-sex sexual orientation from before to after SOCE with the acceptance or rejection of a homosexual identity. Both groups reported higher than average initial same-sex orientation on all three dimensions examined, consistent with the fact the respondents in both groups had adopted a homosexual identity prior to SOCE. Following SOCE, the men who reported a heterosexual identity also reported a strong and significant reduction in same-sex attraction and same-sex sex and increase in opposite-sex sex, while the men who continued to report a homosexual identity reported little (for same-sex attraction) or no (for same-sex and opposite-sex sexual behavior) significant difference. No men who retained a homosexual identity reported full heterosexual difference after SOCE, while none who rejected homosexual identity reported higher same-sex difference, suggesting that the differentiation of sexual identity was closely related to their perception of their same-sex attraction. At the same time, a much higher percentage of those rejecting homosexual identity reported full heterosexual difference in the reduction of same-sex sex than of same-sex attraction, and almost as many men who had retained a homosexual identity reported full heterosexual difference (17%) as reported higher same-sex difference (19%) in same-sex sex, suggesting that these men were better able to resolve unwanted same-sex behavior than unwanted same-sex attraction.

Integration of sexuality

Another method of assessing therapeutic outcomes is by the integration of psychological characteristics in the self. Unlike the heterosexual majority, for sexual minorities the spheres of sexual attraction (who one desires to have sex with), sexual identity (how one defines their sexual orientation) and sexual behavior (who one actually has sex with) are often incongruent. Michael *et al.*, in a large representative study of the U.S. sexual minority population, reported that among sexual minority men who reported either same-sex desire, behavior or identification, only 24% incorporated all three aspects in their identity (Michael *et al*., 1994, p. 42).

As Table 8 shows, exposure to SOCE was associated with improved correlation among attraction, identification and behavior for the men in the sample. Prior to SOCE, attraction and identification were correlated at .63, and behavior was uncorrelated with both identification and attraction. Following SOCE, all three elements were significantly correlated, and the correlation of attraction and identification had increased to .83.

Figures 1 and 2 report the integration of all three aspects of sexual identity prior to and following SOCE exposure in percentage terms for the participants in the current study. Only 4.5% of participants reported the full integration of all three aspects of sexual identity prior to SOCE. Following SOCE this proportion had increased to 15.8%, or 3 times higher. The percentage of participants who reported congruence for only two aspects declined by 7.5% and those reporting no integration at all dropped by 3.7%. In addition to perceived change efficacy, undergoing SOCE is followed by more persons experiencing greater integration of their sexual orientation identity.

Positive and Negative Psychosocial Change

Table 9 presents the participants' reports of the positive and negative changes they considered themselves to have experienced as a result of SOCE in six psychosocial areas: self-esteem, social functioning, depression, self-harm, suicidality, and alcohol or substance abuse. For all six areas the participants experienced both positive and negative changes, however the positive changes were stronger and more widely distributed than the negative changes. The positive changes affected from 17% (for alcohol abuse) to 94% (for self-esteem) of participants, whereas the negative changes were reported by only 5% (for alcohol abuse) to 33% (for depression) of participants. The experience of marked or extreme positive changes ranged from 12% to 61%, while equally strong negative changes only ranged from 1% to 5%. For all six areas the net change, which is the summative index of both positive and negative changes, was a positive number greater than zero. This indicates that, considering both positive and negative changes, the net effect of SOCE for each area was positive. The strongest net positive effect was on depression. Almost three-fourths (73.2%) of respondents reported positive changes in depression due to SOCE, while two-thirds (66.1%) reported no negative changes in depression. The smallest net positive effect was for alcohol or substance abuse. Only 16.9% of participants reported positive changes in this area due to SOCE, although less than 5% (4.8%) experienced corresponding negative changes. Only 2.4% of participants experienced marked or extreme negative changes in suicidal thoughts or attempts as a result of SOCE, while nine times that number (21.8%) experienced similarly strong positive changes in suicidality.

Figure 1

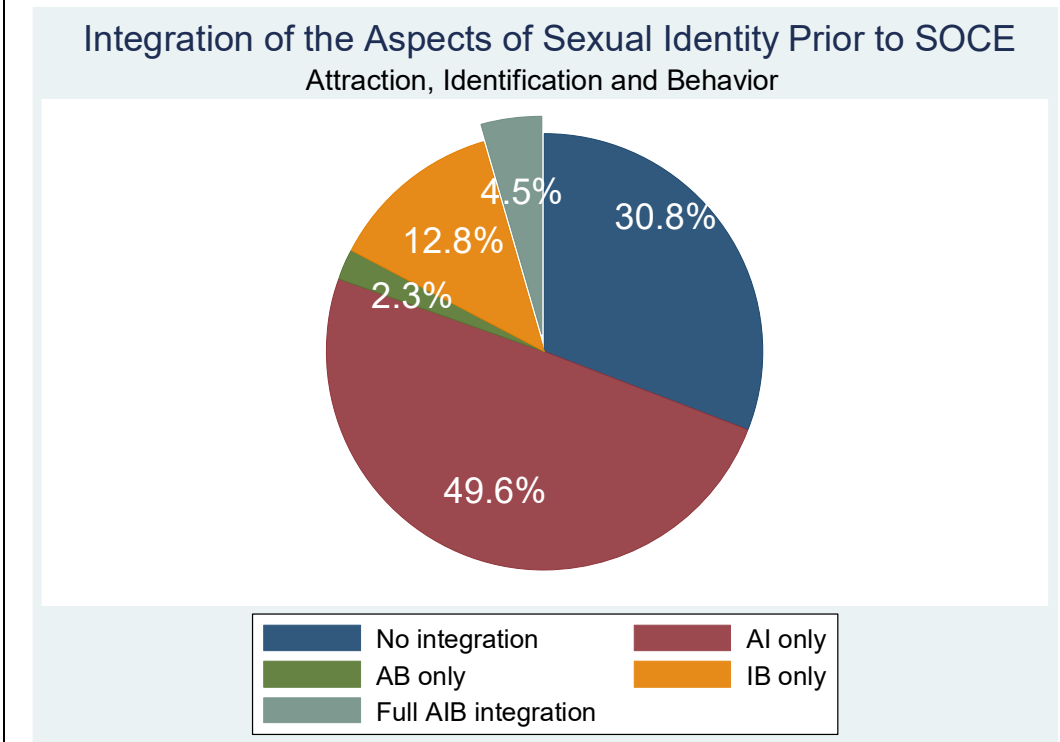
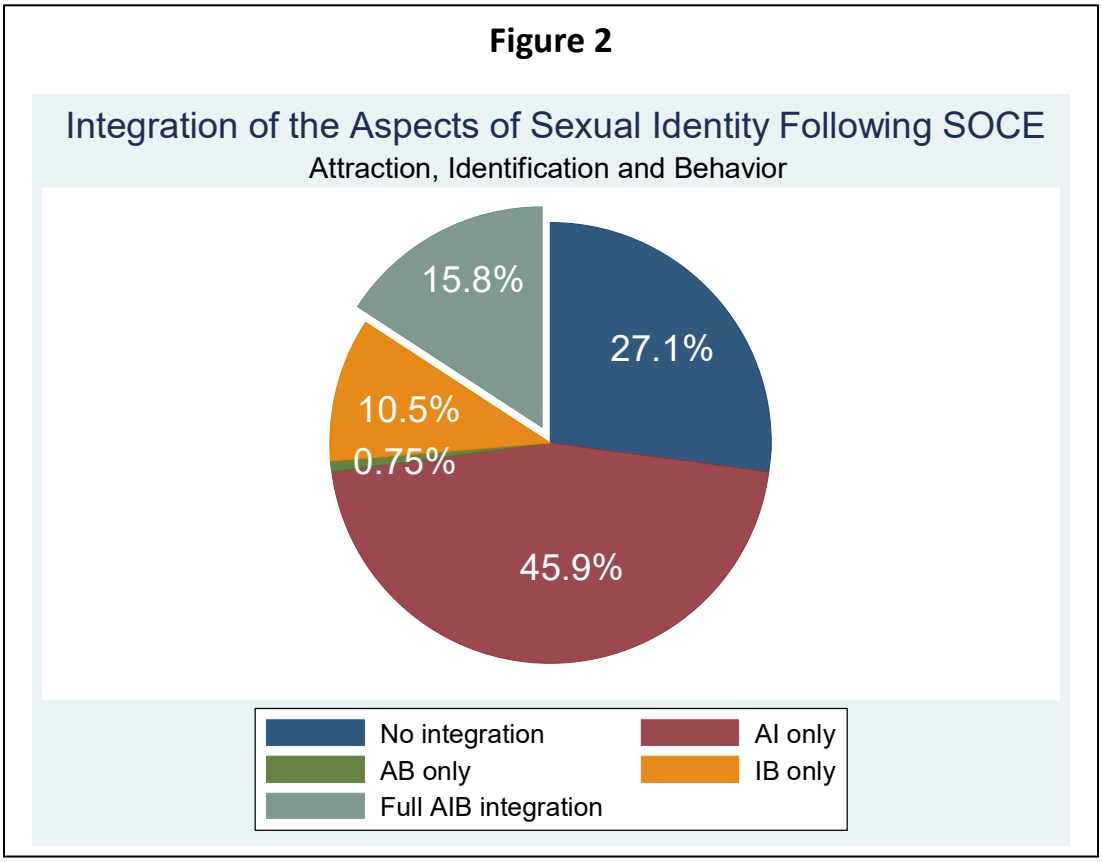


Figure 2



Discussion

On speaking of change

Before discussing the implications of these findings, it is important to establish what the evidence we are examining can and cannot support. Both the design—cross-sectional and retrospective—and sample—a recruited convenience sample—of this study prohibit any claims of causality regarding reported changes or the extension of our findings to any population. In particular, for reasons we discuss further below, these findings cannot be extended to LGB-identified sexual minority persons in general. What these findings do establish, however, is that some men do report changes from same-sex orientation without substantial harm.

In his landmark study of a sample similar to the present one, Spitzer (2003) stated, "Obviously, this study cannot address the question of how often sexual reorientation therapy actually results in the substantial changes reported by most of the participants in this study. … The issue of causality can only be answered by a study with random assignment of gay men and lesbians wishing to change their sexual orientation to either a treatment group (some form of reparative therapy) or a control group." What he did claim, however was that "[t]his study indicates that some gay men and lesbians, following reparative therapy, report that they have made major changes from a predominantly homosexual orientation to a predominantly heterosexual orientation." And he added: "There is no doubt about what the participants in the study reported." (p. 413)

Likewise Nicolosi et al. (2000), examining a sample similar to ours, acknowledged similar limitations to general conclusions, but added: "… despite the fact that we cannot safely generalize beyond our specific sample, this study is important because it documents the existence of a group of dissatisfied homosexually oriented people who experienced conversion therapy from professional therapists and pastoral counselors and perceived that they benefited. It provides clear *prima facie* evidence that conversion therapies and pastoral counseling do help at least *some* dissatisfied homosexually oriented people." (p. 1083) These same claims apply to the present study.

In using terms such as "change", "effect", or "impact" in the following discussion, we are following common practice in referring without further qualification to reported changes in sexual orientation. The evidence of change in this study consists only in comparing the values of two variables pertaining to common elements of sexual orientation—namely, attraction, identity, same-sex sexual activity, and sometimes opposite-sex sexual activity—measured with reference to two different points in time. If the values are different, we interpret it to be a report of change; if they are the same, no change. Either interpretation involves a speculative inference that could be mistaken.

Some contend that to speak of change on the basis of such evidence is unwarranted because we do not know if the reported difference in values corresponds to any genuine or real change. But to the exact same extent, we do not know if a reported equality in values corresponds to a genuine or real lack of change. It is just as unwarranted to deny that change may have occurred when values are the same as it is to deny that change may not have occurred when values differ. Either way, a discussion of evidence that touches on the prospect of change or stability in sexual orientation is necessarily speculative.

Even the distinction between self-reported and "real" change in sexual orientation is speculative, because (among other reasons) no one has access to sexual orientation change other than through self-reports. Recently Srivastava et al. (2022) published a PRISMA review of the 30 highest quality studies of sexual orientation change among youth in the past 20 years. Like the present study, all were based on self-reports of attraction, identification and/or behavior. The study team reported: "all studies used repeated measures of sexual orientation (including labels, identities, attraction, and behavior) to examine changes" in longitudinal data and "retrospective reporting of identity change" in retrospective data (p. 3367). Change in sexual orientation, they reported, occurred in both directions (that is, toward heterosexuality or toward homosexuality), appeared to be increasing, and was not uncommon: "Prevalence of sexual orientation change ranged from 6 to 30% in probability samples of heterosexual and sexual minority youth and 28% to 67% in nonprobability samples of sexual minority youth" (p. 3367). At no point did the review question the veracity of respondent reports or the reasonableness of interpreting reports of different values at different points in time, whether longitudinal or retrospectively reported, as evidence of change in sexual orientation. None of the 30 studies reviewed consisted of a random controlled trial, with objective external measures and a control group, such has been demanded of the present study before it can speak of sexual orientation change or SOCE efficacy for change (F1000Research, 2025). Understanding the limitations we have articulated above, our linguistic usage in this study is wholly in line with this common best practice.

Perceived Changes in Sexuality

We analyzed retrospective cross-sectional data from 125 U.S. men who experienced SOCE to determine the extent to which they reported shifts in their unwanted same-sex attractions, behaviors, and identities from what they recalled them to be before SOCE to what they currently experienced them to be. They also reported how psychologically harmful or helpful they perceived their SOCE experience to have been. We discuss our findings in terms of changes in sexuality, effects of heterosexual marriage, impact on psychological well-being, and acceptance or rejection of a homosexual identity.

Participants perceived differences before and after SOCE in terms of change in undesired same-sex sexuality, reporting on average significant reductions in all three components of same-sex sexual orientation in line with their SOCE goals. Same-sex sex, sexual ideation, desire for same-sex intimacy, and homosexual kissing all were reported to have decreased significantly following SOCE, while the heterosexual counterparts of these measures all were reported to have increased increased significantly.

These results support a middle position between the opposing extremes that therapy-assisted change in sexual orientation is never possible or that such change is readily or widely accessible to sexual minority persons. On the one hand, our findings are consistent with converging evidence from twin, genome-wide association studies, population studies and narrative reports that sexual orientation 1) is not an immutable genetic trait, influenced approximately twice as much by environment as by genetic inheritance (Ganna et al., 2019; Polderman et al., 2015); 2) is observed to be changeable, even fluid, for many over the life course (Calatrava et al., 2023; Diamond, 2016; Diamond & Rosky, 2016); and 3) is reported to change under strong religious influence (Core Issues Trust, 2021; Domen, 2022; Lopez & Klein, 2016; Williams & Woning, 2018).

On the other hand, our findings support prior evidence that sexual orientation is not usually or easily changeable. Although about 19% of the sample indicated a complete diminishing of same-sex attractions and identification, and 37% reported they no longer engaged in same-sex sexual behavior, larger proportions indicated "No change" on each of these dimensions. For attraction and identification, the most common change overall was to a state of bisexuality, not complete heterosexuality.

Moreover, if genetic evidence that the Kinsey scale improperly imposes a homosexual-to-heterosexual range on what is a more complex phenomenon is accurate (Ganna et al., 2019), then interpreting a transition from homosexuality to bisexuality as a move toward "greater heterosexuality" may not be appropriate. It is possible, as Bailey et al. have suggested, that for men sexual attraction may be much less susceptible to change, if at all, than are sexual identity and behavior (Bailey et al., 2016), though our findings of increased congruence following SOCE may suggest otherwise. Genetic complexity also suggests the possibility of multiple etiologies or subtypes of non-heterosexual orientation, in which case it is possible that some persons may be able to transition from one sexual orientation to another without much difficulty, but that for other sexual minority persons, whether for innate or psychological reasons, change is difficult to impossible. If persons who seek therapy to help change are more likely to be in the latter group, as seems plausible, then the clinical population is self-selected for resistance to change. Such a possibility might help explain why research based on clinical samples has generally concluded that change is unlikely, if possible at all, while population studies have documented a relatively large amount of desistance from minority sexual orientation over the life course.

Psychological Well-Being

Unlike most studies in this literature, the survey utilized in our study assessed for *both* positive and negative changes related to SOCE exposure in several indices of psychological well-being. This meant that participants were encouraged to acknowledge the full spectrum of potential mental health outcomes. Overall, we found that a large majority of these sexual minority men perceived their engagement in SOCE to enhance their well-being. Less than 5% of participants reported experiencing negative changes. Reports of positive change were stronger and more widely distributed than those of negative change, most strongly for depression, but also for self-esteem, social functioning, self-harm, suicidality, and alcohol/substance abuse.

Our findings concur with those of Jones and Yarhouse (2011), who reported the SOCE experience of their sample over time led to modestly improved distress levels and countered "… any absolute claim that attempted change is likely to be harmful in and of itself" (p. 425). The results pertaining to depression also approximate the reports of participants in Spitzer's (2003) and Karten & Wade's (2010) studies of similar samples of SOCE participants.

Table 10 validates our findings on psychological outcomes by comparison with those of Karten & Wade's (2010) study, which used the identical measures (albeit coded slightly differently). For all but self-harm, the men in Karten and Wade's sample consistently perceived more positive changes in their psychological functioning than did those in our sample. Despite this difference, the relative magnitude of perceived changes in psychological function was similar in both studies. Men in both studies perceived the most positive change in self-esteem, followed by

social functioning, then depression. In our study self-harm was the next highest change, followed by suicidality, but this order was reversed in Karten and Wade's (2010) study. Finally, in both studies men perceived the least change regarding alcohol and substance abuse. This comparison offers assurance by way of criterion validity that our findings are reasonably accurate.

Of note given accounts of increased suicidality due to SOCE exposure (Meanley et al., 2020; Salway et al., 2020), participants in this study reported nine times more (21.8%) marked or extreme positive effects of SOCE on suicidal thoughts or attempts than they reported a similar degree of negative effects (2.4%). As has been argued elsewhere at length, current claims of psychological harm from SOCE rest on false premises: a failure to control for pre-existing psychological distress that artifactually inflates reports of psychological harm in those who undergo SOCE (Rosik, 2023; D. P. Sullins, 2022) and the conflation of present-day SOCE with long-discontinued harmful aversive therapies (Nicolosi, 2019, p. 12). The present findings confirm the report of the 2009 APA Task Force on SOCE (American Psychological Association, Task Force on Appropriate Therapeutic Responses to Sexual Orientation., 2009) that while "[e]arly studies documented iatrogenic effects of aversive forms of SOCE", research on " recent SOCE," that is, SOCE since 1990, has not demonstrated such harm (p. 3). While further research, including research in these data, could helpfully suggest correlates of greater or lesser psychological benefit or harm, no form of SOCE currently practiced by licensed mental health professionals entails greater prospect of psychological harm than any other form of voluntary talk therapy.

Credibility of Change Reports

As noted above, this study, as all studies of sexual orientation change in this century, relies on self-reported measures of sexual attraction, identity, and sexual behavior. Self-reports are susceptible to misreporting that cannot be easily known and thus merit caution when relying on them. However, the inaccuracy of self-reports of sexual orientation change, and of self-reports generally, has been highly overstated.

Research comparing behavioral self-reports with objective, external measures have repeatedly found that the self-reports were generally accurate, with only small amounts of bias and uncertainty. Schroder et al. (2003) reported on comparisons of daily diaries with self-administered questionnaires that "self-administered questionnaire reports may lead occasionally to overreporting but are, on average, not biased in any particular direction. (Schroder et al., 2003) p. 121 Kormos and Gifford (Kormos & Gifford, 2014) performed a meta-analysis of 15 studies "to quantify the association between self-reported and objective measures of proenvironmental behavior," reporting that the results "revealed a positive and nominally large (Cohen, 1988) effect size (r = .46)" between the two. Manfredo & Shelby compared actual behavior to self-report using separate and combined path models, concluding: "Self-reports were reasonably accurate." (Manfredo & and Shelby, 1988)

The effect of social desirability bias, the most common form of self-report bias, has also been found to be smaller than often thought. Gilles, studying measures of intelligence, a subject highly susceptible to social desirability bias, found that self-reports of intelligence were misstated by only 1% compared to IQ test results. (Gignac, 2018) Schroder et al. (2003) also found that social desirability bias was a much greater problem in interview studies, when the respondent had to speak directly to the interviewer, than with anonymous computer-based responses such as were used in the present study. Examining six studies that had use both face-to-face interviews and

computer-based questions, they found that “In five of the six studies, computerized assessments elicited higher reports of sensitive behaviors and lower reports of socially approved behaviors. p. 115 Tan et al. (2020), from examining surveys that included an explicit measure of SDB, also reported that “that using on-line surveys [such as in the present study] minimizes SDB.” (Tan et al., 2022)

Chan (2010) concluded from an extensive review of self-report validation studies that “there is no strong evidence to lead us to conclude that self-report data are inherently flawed or that their use will always impede out ability to meaningfully interpret correlations of other parameter estimates obtained from the data,” (p. 331) characterizing the belief in the inferiority of self-report measures as an “urban myth” of the social sciences. Contrary to the myth, he added “the extant empirical research literature shows that social desirability responding and its effects are not as ubiquitous as it is widely believed.” (p. 325) Furthermore, “the problem of the myth of superior validity of non-self-report measures is most obvious when assessing constructs that are inherently perceptual in nature,” (p. 326) as is the case for sexual attraction and identity. For such constructs, Chan points out, “even if other (i.e., non-self-report) forms of measures are available, it is difficult to argue for a superior validity of these non-self-report measures given the self- experiential nature of the respondent perception constructs.” (p. 326) This is manifestly the case for sexual attraction and identity in the present study. In practical terms, this means that even if one subscribes to the urban myth Chan rebuts, self-reports of the interior experience of sexual orientation are the most accurate measures by default. Absent a highly speculative claim of superior ontological knowledge (which some assert), we have no better measure of these deeply personal experiential constructs.

There are, of course, some measures of physiological sexual response that claim to validate sexual orientation, although the direction of causation is unclear. Examined closely, however, measures of sexual attraction change in the data of this study tend to confirm, rather than challenge, the results of these external measures (Bailey et al., 2016; D. P. Sullins, 2024). The correspondence of self-reported sexual attraction in this study with the results of physiological measures of male sexual arousal offers strong confirmation of the general accuracy of these self reports. At face value, moreover, self-reported sexual orientation in this study is closely consistent with measures of sexual orientation in other studies.

As Savin-Williams has pointed out in a series of studies (Savin-Williams, 2016, 2017), including re-examinations of over a dozen population datasets (Savin-Williams & Vrangalova, 2013), almost all nonheterosexual persons report some level of mixed sexual attraction to both men and women. On the continuum from heterosexual to homosexual orientation inscribed in the Kinsey scale, almost all sexual minority persons possess bisexual attractions, even though most identify as something else, most commonly “mostly heterosexual.” Since Ganna et al.’s (2019) definitive GWAS discovering that there was not “a single genetic dimension from same-sex to opposite-sex behavior,” (Zietsch et al., 2020) calling for discontinuing the use of the Kinsey scale, sexual orientation research has increasingly moved beyond the idea that nonheterosexual sexual orientation can be ranged on a continuum (Savin-Williams, 2016). When expressed on the Kinsey scale, as in this study, a “change” in sexual orientation more likely consists of incremental change in proportions, such as an increase in same-sex attraction relative to opposite-sex attraction, than a complete switch from one orientation to the other. This pattern closely describes the perceived change reported by the men in this study. Very few men in this sample identified themselves as “bisexual” either before or after SOCE, but almost all of them

could be said to be bisexual in attraction. Moreover, almost none of the men in these data reported moving from complete homosexuality to complete heterosexuality, and almost all who ceased same-sex sexual behavior continued to report some level of same-sex attraction, consistent with the possibility that male sexual arousal is unlikely to change even when sexual behavior does (D. P. Sullins, 2024).

Integration of Sexuality

While the overall change in each dimension of sexuality was small to modest, together they resulted in a three-fold increase in congruence among all three components of sexual orientation, from 5% to 17%, following SOCE (Figures 1 and 2). The increased pairwise correlations among the components of sexual orientation also suggest greater integration among them. Virtually all of the increased integration was around decreased homosexual behavior, identity and attraction.

Significantly for the question of self-report bias, although the underlying changes were self-reported, the increased congruence among the components of sexual orientation was not itself reported by participants. It is a collective change in the sample population that could not have been generally recognized by the sample participants. One of the major distinctions between the heterosexual majority and the non-heterosexual minority population is that for the former the components of sexual identity are far more commonly congruent (Michael et al., 1994). For this minority of our participants, it appears that an effect of SOCE participation may be not only to increase one or more aspects of heterosexual affect but also to organize the sexual self more fully around heterosexual desire and expression.

Effects of Marriage

Being married before engaging in SOCE did not have much effect on reported change in the internal aspects of sexual orientation, i.e., attraction and identification, but did affect reported sexual behaviors, although not consistently in the manner expected. Both married and unmarried men in this highly religious sample reported some degree of success, although married men more so, in conforming to religious norms regarding same-sex sexual activity, but not about opposite-sex sexual activity. Both married and unmarried men significantly reduced engaging in same-sex sex, although married men reported higher same-sex behavior before SOCE and a larger reduction following SOCE. No married men, moreover, but 10% of unmarried men, increased same-sex behavior following SOCE.

Although religious norms discourage opposite-sex sex for unmarried men and encourage it for married men, the men in this sample reported the opposite trends: following SOCE, married men reported engaging in less opposite-sex sex, while unmarried men engaged in more opposite-sex sex, although neither effect was significant. Most men, married (60%) or unmarried (80%), reported no change in opposite-sex behavior associated with SOCE. In sum, marriage appeared to improve the goal of reduced same-sex behavior, but did not improve the goal of increased heterosexual function, for the men in this sample.

Effects of Religiousness

Contrary to expectations, religious motivation appeared to reduce rather than increased desired outcomes. Karten & Wade (2010) also found a significant negative correlation between religiosity and reduced same-sex attraction and behavior after SOCE, contrary to what they had hypothesized. If an increase in desired SOCE outcomes would have confirmed the importance of religious processes such as guilt and forgiveness, a decrease may highlight the contribution of more central, nonreligious psychological processes to SOCE effectiveness. Although almost always occurring in a context where religious convictions are respected, SOCE therapists themselves do not cite religious factors as dispositive for positive outcomes, instead attributing the effectiveness of their work to therapeutic processes, most often psychodynamic (Nicolosi, 1997, 2019) or trauma resolution (Nicolosi, 2016). This may suggest that for this sample of men same-sex attraction was not so much a religious problem for sexuality as a sexuality problem with religion; a distinction for further study and reflection. On the other hand, religious motivation is an indirect measure that may not have captured important dimensions of religiosity, or other factors we could not observe may have suppressed a positive effect of religiousness. Men with higher religious motivation, for example, may have been more inclined to seek SOCE from religious providers that were less effective than professional therapists. Our finding on this question underscores the need for further research on the predictors of perceived SOCE effectiveness in a comprehensive multivariate context.

Effect of Sexual Identity

Rejecting a homosexual identity had an extremely strong association with perceived reductions in same-sex attraction and sexual activity. Unlike most sexual minority data, identity was defined by categories that closely tracked attraction, likely contributing to the strength of the observed association, and the causal influences involved are most likely mutual. Nevertheless, the strength of this effect—an effect size of 2.6—underscores the stark difference between men who accept and those who reject a homosexual identity, even while acknowledging the presence of same-sex attraction.

These findings are consistent with an emerging literature suggesting the perils for accurate scientific understanding of ignoring a subgroup of sexual minority individuals who experience some degree of same-sex attractions but reject an LGB identity. Sexual minorities who reject an LGB identity have been found to have more positive appraisals of their change efforts than LGB-identified individuals (Rosik et al. 2021a, 2021b, 2023). A similar contrast was found for sexual minorities who adhered to a more conservative theological viewpoint compared to those who did not (Rosik et al., 2023). These findings, should they continue to be replicated, suggest the presence of an important lacuna in the current SOCE literature that we outline below.

Harmonizing the SOCE Literature

The somewhat striking bifurcation in findings pertaining to SOCE has received minimal attention within the literature. Most common are attempts by opponents and proponents of change-oriented goals to ignore or invalidate consumer accounts that are not in keeping with their experiences of SOCE or the experiences of sexual minorities within their social networks. It is important to develop testable explanations for the apparent divergence in SOCE reports,

particularly as findings purporting SOCE harms are currently being utilized to legally restrict therapeutic options. Should there be credibility to reports of significant SOCE benefits and negligible harms, then the legitimacy of broad bans on professional and religious practice and speech could be brought into question. In light of this need, we propose a plausible explanation to harmonize this literature: *Researchers are studying very different subpopulations of sexual minorities, distinguished in large part by their different experiences of contemporary, speech-based forms of SOCE, which should not be generalized to all sexual minorities.*

As early as 2002, Shidlo and Schroeder (2002) observed a fundamental truth about many consumers of SOCE, stating, "… we have found that conversion therapists and many clients of conversion therapy steadfastly reject the use of *lesbian* and *gay*" (p. 249, emphasis in original). In fact, the emerging literature now suggests this rejection of an LGBT identity may be a marker for a constellation of characteristics this sexual minority subgroup often report. These individuals appear to be more active in conservative religious settings, full members of their church, less sexually active, more likely to be single and celibate or in mixed orientation relationships, less accepting of their same-sex attractions, experience greater opposite sex attractions, and place more importance on a family and child centered life (Lefevor et al., 2020). As noted above, they also report modest to moderate helpfulness of change-oriented psychotherapy goals compared to LGB identified individuals, who report modest to moderate harmfulness (Rosik et al., 2021b, 2023). However, contrary to conventional wisdom, sexual minorities who rejected an LGB identity did not appear to report more adverse psychosocial health than those who had adopted an LGB identity (Lefevor et al., 2020). These subgroups also reported similar degrees of resolution of any conflict between their religious and sexual identities.

Examining the recruitment methods and sample characteristics of the aforementioned SOCE studies supports the hypothesis that researchers have likely investigated only one of these sexual minority subgroups at the expense of the other. Samples are often exclusively or mostly dominated either by LGB+ identified participants (Blosnich et al., 2020; Bradshaw et al., 2015; Flentje et al., 2013; Meanley et al., 2020; Ryan et al., 2020; Salway et al., 2020; Tran et al., 2024) or by participants with a likelihood of much lower levels of LGB identification given recruitment venues (Jones & Yarhouse, 2011; Karten & Wade, 2010; Spitzer, 2003). SOCE researchers tend to recruit participants through the venues and networks most easily accessible to them; hence, samples usually reflect this selection bias. Several studies have recruited most if not all of their participants via LGB identified networks and venues (Flentje et al., 2013; Ryan et al., 2020; see Rosik, 2023 for an overview) or networks and venues inhabited by those pursuing change (Jones & Yarhouse, 2011; Karten & Wade, 2010; Spitzer, 2003). Some studies have attempted to recruit participants from both change-oriented and gay-affirming networks (Bradshaw et al., 2015; Dehlin et al., 2015; Shidlo & Schroeder, 2002), but these efforts may have been hampered by the lack of an ideologically diverse research team that would generate trust and improve participation among sexual minorities in change-oriented networks, leading to samples with large numbers of participants who are alienated from their religious communities. Relatedly, (Meanley et al., 2020) noted that those participants who did not complete survey responding and hence were excluded from their analyses were disproportionally non-LGB identified.

Our findings correspond with results reported from similar studies involving less prevalent LGB-identified participants recruited through change-oriented networks. We acknowledge our results do not provide a complete understanding of SOCE experiences among sexual minorities.

Professional and social polarization around SOCE currently interfere with the production of ideologically diverse scholarship on this topic that might enable the identification and dissemination of areas of consensus across sociopolitical perspectives. Examples of likely candidates for consensus agreement regarding SOCE might include the avoidance of aversive techniques, promises of change, and coercive processes. Until this ideological and political divide is overcome, the current state of SOCE research may be compared to two groups who study marital counseling, one of which investigates consumers who have maintained their marriage and the other who examines persons who have since divorced. Neither group is likely to possess the whole truth about the relative benefits and risks of the treatment in focus.

Perhaps the clearest indicator of this divide is the sharply divergent religiosity reported by change-oriented and LGB-identified samples. Fully 88% of our participants reported attendance at religious services weekly or more often, and only 2.4% reported attending rarely or never. By contrast, in a recent population sample of LGB-identified sexual minorities only 9% reported at least weekly religious service attendance and 69% reported attending seldom or never (Meyer, 2020, p. 324). The former are far more religiously active and the latter far less religiously active than are Americans in general, of whom 33% reported attending religious services at least weekly and 31% seldom or never in 2016 (Pew Research Center, 2019). It is possible that the prospect of change or stability in sexual orientation is linked to the notably high religiousness of the change-oriented sample and the notably low religiousness of the LGB-identified sample, as manifested in the rejection or adoption of an LGB+ identity. Future research that incorporates both populations could help to clarify this possibility.

Ideally, future SOCE research will consider this current division in the field and pursue ways to mitigate the limitations this imposes on the science, including the formation of ideologically diverse research teams (e.g., (Lefevor et al., 2019). Also recommended are recruitment strategies that either employ population-based samples able to identify sexual minorities who reject LGB identities or purposefully seek out sexual minorities not LGB identified for sample inclusion. In general, the integrity of science and the welfare of all sexual minorities will be better served by greater communication and collaboration among opponents and proponents of SOCE.

Limitations

In addition to emphasizing, as we have above, the speculative nature of any discussion of sexual orientation change, it is important to clearly note the limitations of this study. First and foremost, our findings cannot be definitive regarding any assertion that sexual orientation can change, only that some highly religious men report such changes, the pursuit of which they generally do not perceive to have been harmful. Results that could overcome skepticism on this ideologically fraught question would require a random controlled trial which included, at minimum, longitudinal measurement of sexual orientation, control group comparisons and validated measures. We do not claim, and have never claimed, that the present study provides this level of proof.

In addition to this serious limitation, we also note, second, that the sample we studied is a convenience sample that is not statistically representative of any population. Our sample consisted entirely of men, most of whom were white, affluent, well-educated, highly religious, and overrepresented the Mormon faith, as is common to this literature (e.g., (Karten & Wade, 2010). The sample was not randomly drawn, therefore inferential tests cannot indicate quantitative representativeness of any population. They may speculatively indicate substantive

representativeness to the extent that the sample of this study is plausibly characteristic of the general group of persons seeking SOCE intervention, but nothing beyond this.

Third, the self-report nature of our data means that they are susceptible to an unknown degree of recall bias, favorability bias, and other forms of uncertainty which are well documented regarding such reports. Our study is not unique with respect to these measurement limitations, which are nearly ubiquitous in the literature on SOCE (Bradshaw et al., 2015; Ryan et al., 2020; Shidlo & Schroeder, 2002). Moreover, as noted above, in studying sexual orientation change there is no alternative to, and therefore no better measure available than, personal self-report.

The single-item nature of many of our variables, common for exploratory studies, precludes our ability to establish their psychometric properties. Some of our analyses (i.e., regarding marriage) utilized small sample sizes that may have been underpowered and placed limits on the reliability of these results.

Since just under 42% of our sample was still pursing SOCE at the time of the survey, it is possible that some of these men may have later given up their pursuit of change and came to feel differently about their SOCE experience. Critiques of positive SOCE accounts often express concerns about later changes in perceptions of SOCE among consumers who are still pursuing or recently completed SOCE. Alternatively, they express concerns about recall bias with beneficial claims from consumers whose experiences of SOCE occurred years ago (American Psychological Association, Task Force on Appropriate Therapeutic Responses to Sexual Orientation., 2009). This may betray a general unwillingness to consider the possibility some sexual minorities could actually have lasting positive SOCE experiences. In this regard, we note that most of our participants reported similar levels of desired change from their SOCE whether they were still pursuing change or had completed their pursuit of change several years earlier. Still, we do not have a complete picture of what characteristics may be associated with reported change via SOCE, so it cannot be assumed that most highly religious and motivated men who seek SOCE will perceive an experience of change. Clinicians who work with clients having similar backgrounds and motivations should neither create expectations of complete (categorical) change nor of the strict immutability of same-sex sexuality.

Further research

This initial exploration of a sample of SOCE consumers has raised many more questions than it has answered. We consider this a positive result for any scientific study. Schumm & Crawford (Schumm & Crawford, 2023) were the first to respond to this study by suggesting questions for further research, which are worth reporting at length: “Would men who became more homosexually oriented over time reject their SOCE experience and/or report high levels of dissatisfaction? Would a strong homosexual sexual identity before therapy reduce the chances of success in terms of reducing same-sex attraction? Would there be interaction effects among pre-test and post-test measures of sexual attraction, behavior, and identity? Would it be possible to develop a typology of satisfaction with therapy experience overall? Were younger clients more or less likely to report greater harms versus benefits from SOCE? Did congruence between sexual orientation attraction and identity before SOCE predict SOCE outcomes?” Schumm has also published a follow-up analysis of the data used in the present study addressing other questions (Schumm, 2022).

We appreciate the questions and suggestions for further research by the reviewers of this journal, all of which would add to our understanding of this stigmatized form of therapy. As noted above,

the relation of religiosity to SOCE outcomes would be fruitful issue for further study in these data, as would be marriage effects. Further study of the relation of change in sexual behavior to change in attraction could speak to the articulation of behavior and desire in the presence or absence of religious norms. The relation of perceived sexual orientation change to perceived psychological benefit from SOCE could contribute new and unique evidence to the discussion of a disputed theoretical issue. Studies differentiating outcomes related to therapeutic modalities (psychoanalytic, cognitive behavioral, etc.) and other provider characteristics would be especially valuable for practitioners in this field. Most valuable of all, in our view, would be the development of a multivariate model predicting self-perceived change in sexual orientation, which would offer valuable context for the bivariate effects examined separately in this study, providing as a basis for further research on all the questions raised by this study.

Conclusion

We analyzed a sample of 125 men exposed to SOCE to investigate the perceived helpfulness and safety of such change efforts in modifying unwanted same-sex attractions, behaviors, and identities. On average, participants reported significant changes in their sexuality in line with their SOCE goals, possibly contributing to an enhanced integration or congruence among these dimensions. The maintenance of religious norms of sexual fidelity within and abstinence without heterosexual marriage appeared to be an important motivating factor for many in our sample, and our findings are consistent with the inference that most participants found SOCE beneficial in this regard. We also found pursuit of SOCE to be associated with enhanced psychological well-being for a large majority of participants, with negative effects being reported by less than 1 in 20 consumers. While our findings preclude strong assertions that therapy-assisted change in sexual orientation is never possible, they also do not support strong assurances that therapy-assisted change is generally achievable in the sexual minority population. The polarization within organized psychology over SOCE appears to have led to insular research that treats one subgroup of sexual minorities as representative of the whole population, with detrimental consequences for accurately comprehending the complexities of sexual orientation change among these individuals.

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Tables

Table 1. Sample characteristics (N=125)

Variable	Percent	Variable	Percent
Total Married	51 (41 %)	Highest Education	
1-5 years	17.7 %	High school	2.4 %
6-10	7.8 %	Some college or AA degree	24.2 %
11-25	39.2 %	Bachelors Degree	36.3 %
26-50	35.3 %	Masters Degree	28.2 %
Age		Doctoral Degree	8.9 %
18-25 years	14.4 %	Church attendance	
26-35	28.0 %	Daily	8.0 %
36-45	18.4 %	Few times a week	24.8 %
46-55	23.2 %	Once a week	55.2 %
56-65	15.2 %	A few times a month	8.0 %
66+	0.8 %	Major holidays	1.6 %
Ethnicity		Rarely or never	2.4 %
African American/Black	1.6 %	Religious Affiliation	
Asian/Pacific Islander	0.8 %	Unspecified Christian	35.0 %
Caucasian/White	91.1 %	Mormon (LDS)	28.5 %
Hispanic	4.9 %	Non-Denominational Christian	13.8 %
Multi-racial	1.6 %	Jewish	9.8 %
Household Income		Roman Catholic	6.5 %
$0-10,000	6.6 %	Baptist	4.1 %
$10,001-$25,000	15.7 %	Episcopalian	0.8 %
$25,001-$50,000	19.8 %	Methodist	1.6 %
$50,001-$75,000	17.4 %	Region of residence	(n=106)
$75,001-$100,000	16.5 %	West	54.7 %
$100,001-$150,000	14.1 %	Central	9.4 %
$150,000+	9.9 %	South	13.2 %
		East	22.6 %

Table 2. Mean Difference in Reported Attraction, Identification and Four Aspects of Behavior Before and After SOCE (N=125)

	Before SOCE	After SOCE	Mean Difference	Difference: sign test	Difference: t-test	Reliability Coefficient (Alpha)	Effect size
	Mean (SE)	Mean (SE)	Mean (SE)	p	T-test, df (p)	(Married only)	Cohen's d
Attraction	5.73 (.10)	4.14 (.16)	-1.59 (.15)	.000	-10.49, 123 (.000)	.73	-.94
Identification	4.80 (.18)	3.58 (.17)	-1.22 (.18)	.000	-6.75, 124 (.000)	.84	-.60
Same-Sex Sex	2.41 (.14)	1.50 (.09)	-0.91 (.15)	.000	-6.20, 122 (.000)	.68	-.56
Homosexual Sex ideation	4.5 (.08)	3.2 (.12)	-1.40 (.14)	.000	-10.27, 123 (.000)	.34	-.92
Desire for Homosexual intimacy	4.00 (.13)	2.97 (.13)	-1.03 (.15)	.000	-6.98, 123 (.000)	.70	-.63
Homosexual Kissing	1.79 (.11)	1.37 (.08)	-0.42 (.12)	.002	-3.51, 122 (.001)	.39	-.32
Heterosexual Sex	1.7 (.11)	2.0 (.12)	0.28 (.11)	.014	2.61, 122 (.010)	.72	.24
Heterosexual Sex ideation	1.8 (.10)	2.8 (.13)	1.01 (.12)	.000	8.27, 122 (.000)	.77	.75
Desire for Heterosexual intimacy	2.45 (.13)	3.39 (.14)	0.94 (.13)	.000	7.51, 121 (.000)	.66	.68
Heterosexual Kissing	1.82 (.11)	2.18 (.13)	0.36 (.12)	.003	3.15, 120 (.002)	.73	.29

Sign test reported is the p-value for a two-tailed signed-rank test for difference of two paired distributions; T-test reported is the paired sample t-test with 124 degrees of freedom. The alpha coefficient for all ten items in the table combined is .87. SE, standard error; df, degrees of freedom; p, p-value.

Table 3. Proportions reporting four categories of difference in sexual orientation measures following SOCE (n=125)

	Attraction	Identification	Same-Sex Sex	Opposite-Sex Sex
	% or mean (S.E.)	% or mean (S.E)	% or mean (S.E)	% or mean (S.E)
Mean before SOCE	5.73 (.10)	4.80 (.18)	2.41 (.14)	1.69 (.11)
Higher same-sex difference	4.0 (1.8)	9.6 (2.6)	8.1 (2.5)	7.2 (2.3)
No difference	27.4 (4.0)	36.0 (4.3)	47.2 (4.5)	73.6 (3.9)
Higher but not full heterosexual difference	50.0 (4.5)	35.2 (4.3)	8.1 (2.5)	8.0 (2.4)
Full heterosexual difference	18.5 (3.5)	19.2 (3.5)	36.6 (4.3)	11.2 (2.8)
Mean after SOCE	4.14 (.16)	3.58 (.17)	1.50 (.09)	1.97 (.12)
Mean difference, before to after SOCE	-1.59 (.15)	-1.22 (.18)	-0.91 (.15)	0.28 (.11)
Mean Difference test	t, df, p, *d*	t, df, p, *d*	t, df, p, *d*	t, df, p, *d*
	-10.49, 123 .000, -.94	-6.75, 124 .000, -.60	-6.20, 122 .000, -.56	2.61, 122 .010, .24

Shaded cells report mean values; unshaded cells report percentages or test results. S.E., Standard Error; t, t-test statistic; df, degrees of freedom; p, p-value; d, Cohen's d.

Table 4. Differences in reported dimensions of sexual orientation before and after SOCE by therapy status: completed (n=72) or still ongoing (n=52)

	Attraction			Identification			Reduced Same-Sex Sex			Increased Opposite-Sex Sex		
Still in therapy?	Yes	No	Test Y=N	Yes	No	Test Y=N	Yes	No	Test Y=N	Yes	No	Test Y=N
	Mean or % (S.E.)	Mean or % (S.E.)	t, df p, *d*	Mean or % (S.E.)	Mean or % (S.E.)	t, df p, *d*	Mean or % (S.E.)	Mean or % (S.E.)	t, df p, *d*	Mean or % (S.E.)	Mean or % (S.E.)	t df p, *d*
Mean before SOCE	5.90 (.13)	5.63 (.14)	1.39, 122 .166, .25	5.06 (.28)	4.61 (.23)	1.25, 122 .214, .23	2.52 (.22)	2.34 (.18)	.632, 121 .529, .12	1.71 (.17)	1.65 (.13)	.273, 120 .785, .05
Higher same-sex difference	1.96 (2.0)	5.6 (2.7)	.991, 121 .324, .18	9.62 (4.1)	9.72 (3.5)	.020, 122 .984, .00	7.69 (3.7)	8.57 (3.4)	.174, 120 .862, .03	3.85 (2.7)	9.72 (3.5)	1.24, 122 .217, .23
No difference	33.3 (6.7)	22.2 (4.9)	1.37, 121 .173, .25	30.8 (6.5)	38.9 (5.8)	.928, 122 .355, .17	46.2 (7.0)	47.1 (6.0)	.107, 120 .915, .02	88.5 (4.5)	62.5 (5.7)	3.35, 122 .001, .61
Higher but not full heterosexual difference	47.1 (7.1)	52.8 (5.9)	.621, 121 .536, .11	40.4 (6.9)	31.9 (5.5)	.965, 122 .336, .18	13.5 (4.8)	4.29 (2.4)	1.84, 120 .069, .34	1.93 (1.9)	12.5 (3.9)	2.16, 122 .033, .39
Full heterosexual difference	17.6 (5.4)	19.4 (4.7)	.250, 121 .803, .05	19.2 (5.5)	19.4 (4.7)	.030, 122 .977, .01	32.7 (6.6)	40.0 (5.9)	.823, 120 .412, .15	5.77 (3.3)	15.3 (4.3)	1.66, 122 .100, .30
Mean after SOCE	4.31 (.24)	4.00 (.21)	.969, 121 .335, .18	3.77 (.27)	3.42 (.23)	.988, 122 .325, .18	1.62 (.15)	1.41 (.11)	1.11, 121 .268, .20	1.73 (.18)	2.11 (.17)	1.57, 120 .120, .29
Mean difference before to after SOCE	-1.57 (.24)	-1.63 (.20)	.182, 121 .856, .03	-1.29 (.27)	-1.19 (.23)	-.253, 122 .801, .05	-.904 (.24)	-.929 (.19)	.082, 120 .935, .02	.020 (.10)	.465 (.17)	2.08, 120 .039, .38
Mean Difference test	t, df, p, *d*	t, df, p, *d*		t, df, p, *d*	t, df, p, *d*		t, df, p, *d*	t, df, p, *d*		t, df, p, *d*	t, df, p, *d*	
	6.50, 50 .000, 1.13	8.24, 71 .000, 1.07		4.21, 51 .000, .65	5.31, 71 .000, .61		3.90, 51 .000, .65	4.80, 69 .000, .73		.198, 50 .844, .02	2.79, 70 .007, .37	

Shaded cells report mean values; unshaded cells report percentages or test results. S.E., Standard Error; t, t-test statistic; df, degrees of freedom; p, p-value; *d*, Cohen's d. Column percentages may not total exactly 100 due to rounding.

Table 5. Differences in reported dimensions of sexual orientation before and after SOCE by marital status before SOCE: married (n=35) or not married (n=88)

	Attraction			Identification			Reduced Same-Sex Sex			Increased Opposite-Sex Sex		
Married before SOCE?	Yes	No	Test Y=N	Yes	No	Test Y=N	Yes	No	Test Y=N	Yes	No	Test Y=N
	Mean or % (S.E.)	Mean or % (S.E.)	t, df p, *d*	Mean or % (S.E.)	Mean or % (S.E.)	t, df p, *d*	Mean or % (S.E.)	Mean or % (S.E.)	t, df p, *d*	Mean or % (S.E.)	Mean or % (S.E.)	t df p, *d*
Mean before SOCE	5.11 (.20)	6.02 (.10)	4.54, 121 .000, .91	4.14 (.30)	5.03 (.21)	2.31, 121 .023, .46	3.00 (.27)	2.21 (.16)	2.57, 120 .011, .52	3.23 (.17)	1.08 (.04)	16.4, 119 .000, 3.29
Higher same-sex difference	0 (0)	5.7 (2.5)	1.45, 120 .150, .29	5.71 (4.0)	11.4 (3.4)	.949, 121 .345, .19	0 (0)	10.3 (3.3)	1.96, 119 .052, .40	17.1 (6.5)	3.4 (1.9)	2.69, 121 .008, .54
No difference	37.1 (8.3)	23.0 (4.5)	1.60, 120 .113, .32	45.7 (8.5)	31.8 (5.0)	1.45, 121 .149, .29	35.3 (8.3)	51.7 (5.4)	1.63, 119 .105, .33	60.0 (8.4)	79.5 (4.3)	2.26, 121 .026, .45
Higher but not full heterosexual difference	40.0 (8.4)	55.2 (5.4)	1.52, 120 .132, .30	28.6 (7.7)	38.6 (5.2)	1.05, 121 .297, .21	14.7 (6.2)	5.75 (2.5)	1.61, 119 .110, .33	11.4 (5.5)	6.82 (2.7)	.840, 121 .403, .17
Full heterosexual difference	22.9 (7.2)	16.1 (4.0)	.875, 120 .384, .18	20.0 (6.9)	18.2 (4.1)	.232, 121 .817, .05	50.0 (8.7)	32.2 (5.0)	1.83, 119 .069, .37	11.4 (5.5)	10.2 (3.2)	.194, 121 .847, .04
Mean after SOCE	3.77 (.27)	4.31 (.19)	1.54, 120 .125, .31	3.17 (.29)	3.75 (.22)	1.49, 121 .139, .30	1.53 (.20)	1.48 (.10)	.153, 120 .878, .03	3.14 (.20)	1.47 (.12)	7.56, 119 .000, 1.52
Mean difference before to after SOCE	-1.34 (.22)	-1.70 (.20)	1.06, 120 .293, .21	-1.3 (.27)	-1.2 (.24)	.783, 121 .435, .16	-1.47 (.24)	-0.72 (.18)	2.30, 119 .023, .47	-.086 (.18)	+.384 (.04)	2.09, 119 .039, .42
Mean Difference test	t, df, p, *d*	t, df, p, *d*		t, df, p, *d*	t, df, p, *d*		t, df, p, *d*	t, df, p, *d*		t, df, p, *d*	t, df, p, *d*	
	6.20, 34 .000, .96	8.67, 86 .000, 1.20		4.36, 34 .000, .55	5.46, 87 .000, .64		6.23, 33 .000, 1.08	4.02, 86 .000, .57		.488, 34 .629, .08	3.10, 85 .003, .47	

Shaded cells report mean values; unshaded cells report percentages or test results. S.E., Standard Error; t, t-test statistic; df, degrees of freedom; p, p-value; *d*, Cohen's d. Column percentages may not total exactly 100 due to rounding.

Table 6. Differences in reported dimensions of sexual orientation before and after SOCE by motivation for seeking change: religious (n=67) or other (n=58)

	Attraction			Identification			Reduced Same-Sex Sex			Increased Opposite-Sex Sex		
Religious motivation for seeking SOCE?	Yes	No	Test Y=N	Yes	No	Test Y=N	Yes	No	Test Y=N	Yes	No	Test Y=N
	Mean or % (S.E.)	Mean or % (S.E.)	t, df p, *d*	Mean or % (S.E.)	Mean or % (S.E.)	t, df p, *d*	Mean or % (S.E.)	Mean or % (S.E.)	t, df p, *d*	Mean or % (S.E.)	Mean or % (S.E.)	t df p, *d*
Mean before SOCE	5.91 (.13)	5.53 (.15)	1.92,123 .057, .35	5.06 (.23)	4.50 (.27)	1.60, 124 .112, .29	2.34 (.19)	2.47 (.21)	.461, 122 .646, .08	1.48 (.12)	1.93 (.17)	2.14, 121 .035, .39
Higher same-sex difference	6.06 (3.0)	1.7 (1.7)	1.22, 122 .224, .22	10.4 (3.8)	8.6 (3.7)	.343, 123 .732, .06	10.6 (3.8)	5.3 (3.0)	1.08, 121 .283, .19	17.1 (6.5)	3.4 (1.9)	2.69, 121 .008, .54
No difference	34.8 (5.9)	19.0 (5.2)	1.99, 122 .048, .36	41.8 (6.1)	29.3 (6.0)	1.45, 123 .150, .26	48.5 (6.2)	45.6 (6.7)	.316, 121 .753, .06	60.0 (8.4)	79.5 (4.3)	2.26, 121 .026, .45
Higher but not full heterosexual difference	53.0 (6.2)	46.6 (6.6)	.716, 122 .476, .13	37.3 (6.0)	32.8 (6.2)	.528, 123 .598, .09	7.6 (3.3)	8.8 (3.8)	.240, 121 .811, .04	11.4 (5.5)	6.82 (2.7)	.840, 121 .403, .17
Full heterosexual difference	6.10 (3.0)	32.8 (6.2)	4.03, 122 .000, .73	10.4 (3.8)	29.3 (6.0)	2.73, 123 .007, .49	33.3 (5.8)	40.4 (6.6)	.801, 121 .425, .14	11.4 (5.5)	10.2 (3.2)	.194, 121 .847, .04
Mean after SOCE	4.71 (.19)	3.48 (.23)	4.12, 122 .000, .74	4.12 (.24)	2.95 (.23)	3.48, 123 .001, .62	1.56 (.13)	1.42 (.13)	.802, 122 .424, .14	1.73 (.15)	2.25 (.20)	2.14, 121 .035, .39
Mean difference before to after SOCE	-1.18 (.19)	-2.05 (.23)	2.95, 122 .004, .53	-0.94 (.23)	-1.55 (.28)	1.69, 123 .093, .30	-0.79 (.20)	-1.05 (.21)	.898, 121 .371, .16	+.242 (.14)	+.316 (.16)	.344, 121 .732, .06
Mean Difference test	t, df, p, *d*	t, df, p, *d*		t, df, p, *d*	t, df, p, *d*		t, df, p, *d*	t, df, p, *d*		t, df, p, *d*	t, df, p, *d*	
	6.16, 65 .000, .89	9.08, 57 .000, 1.39		4.06, 66 .000, .49	5.53, 57 .000, .82		3.88, 65 .000, .59	4.94, 56 .000, .80		1.73, 65 .088, .22	1.94, 56 .057, .23	

Shaded cells report mean values; unshaded cells report percentages or test results. S.E., Standard Error; t, t-test statistic; df, degrees of freedom; p, p-value; *d*, Cohen's d. Column percentages may not total exactly 100 due to rounding.

Table 7. Differences in reported dimensions of sexual orientation before and after SOCE by rejection (n=37) or acceptance (n=48) of homosexual identity

	Attraction			Reduced Same-Sex Sex			Increased Opposite-Sex Sex		
Rejected homosexual identity?	Yes	No	Test Y=N	Yes	No	Test Y=N	Yes	No	Test Y=N
	Mean or % (S.E.)	Mean or % (S.E.)	t, df p, *d*	Mean or % (S.E.)	Mean or % (S.E.)	t, df p, *d*	Mean or % (S.E.)	Mean or % (S.E.)	t, df p, *d*
Mean before SOCE	6.03 (.15)	6.10 (.13)	.391, 83 .697, .09	2.97 (.29)	2.04 (.20)	2.75, 83 .007, .60	1.36 (.14)	1.53 (.16)	.757, 81 .451, .17
Higher same-sex difference	0 (0)	10.4 (4.5)	2.05, 83 .044, .45	0 (0)	18.8 (5.7)	2.85, 82 .006, .63	5.4 (3.8)	8.3 (4.0)	.517, 83 .606, .11
No difference	0 (0)	56.3 (7.2)	6.82, 83 .000, 1.49	36.1 (8.1)	56.3 (7.2)	1.84, 82 .069, .41	62.2 (8.1)	81.3 (5.7)	1.98, 83 .0503, .43
Higher but not full heterosexual difference	67.6 (7.8)	33.3 (6.9)	3.29, 83 .002, .72	5.6 (3.9)	8.3 (4.0)	.484, 82 .630, .11	10.8 (5.2)	6.3 (3.5)	.752, 83 .454, .17
Full heterosexual difference	32.4 (7.8)	0 (0)	4.03, 122 .000, .73	58.3 (8.3)	16.7 (5.4)	4.36, 82 .000, .96	21.6 (6.9)	4.2 (2.9)	2.54, 83 .013, .56
Mean after SOCE	2.81 (.20)	5.81 (.12)	13.6, 83 .000, 2.97	1.08 (.06)	1.90 (.18)	3.80, 82 .000, .84	2.08 (.24)	1.57 (.16)	1.83, 81 .072, .40
Mean difference before to after SOCE	-3.22 (.24)	-0.29 (.12)	11.7, 83 .000, 2.56	-1.92 (.29)	-0.15 (.21)	5.13, 82 .000, 1.13	+72.2 (.23)	+4.3 (.17)	2.43, 81 .017, .54
Mean Difference test	t, df, p, *d*	t, df, p, *d*		t, df, p, *d*	t, df, p, *d*		t, df, p, *d*	t, df, p, *d*	
	13.4, 36 .000, 3.00	2.45, 47 .018, .34		6.71, 35 .000, 1.48	.700, 47 .488, .11		3.08, 35 .004, .61	.256, 46 .799, .04	

Shaded cells report mean values; unshaded cells report percentages or test results. S.E., Standard Error; t, t-test statistic; df, degrees of freedom; p, p-value; *d*, Cohen's d. Column percentages may not total exactly 100 due to rounding.

Table 8. Correlation of sexual attraction, identification and behavior prior to and following SOCE (n=125)

Correlation	Before SOCE	After SOCE
	r (p)	r (p)
Attraction and Identification	.47 (.000)	.84 (.000)
Attraction and Same-sex Sex	.11 (.214)	.38 (.000)
Attraction and Opposite-sex Sex	-.45 (.000)	-.24 (.009)
Identification and Same-sex Sex	.16 (.082)	.35 (.000)
Identification and Opposite-sex Sex	-.24 (.007)	-.24 (.008)

r, pearson correlation coefficient; p, p-value

Table 9. Summary of reported positive and negative changes in six areas of psychosocial function as a result of SOCE (in percent)

	Self-esteem	Social Functioning	Depression	Self-Harm	Suicidality	Alcohol/ Substance Abuse
Positive changes	Mean or % (S.E.)	Mean or % (S.E.)	Mean or % (S.E.)	Mean or % (S.E.)	Mean or % (S.E.)	Mean or % (S.E.)
None/ Not applicable	5.6 (2.1)	9.7 (2.7)	26.8 (4.0)	53.2 (4.5)	62.1 (4.4)	83.1 (3.4)
Slight or Moderate	33.1 (4.2)	39.5 (4.4)	38.2 (4.4)	20.2 (3.6)	16.1 (3.3)	4.8 (1.9)
Marked or Extreme	61.3 (4.4)	50.8 (4.5)	35.0 (4.3)	26.6 (4.0)	21.8 (3.7)	12.1 (2.9)
Mean positive changes	2.70 (.11)	2.34 (.11)	1.80 (.13)	1.24 (.14)	1.02 (.14)	.50 (.11)
T-test: mean positive > 0	t, df p, *d*	t, df p, *d*	t, df p, *d*	t, df p, *d*	t, df p, *d*	t, df p, *d*
	25.0, 123, .000, 2.25	21.7, 123, .000, 1.95	14.1, 122, .000, 1.27	9.02, 123, .000, .81	7.52, 123, .000, .68	4.56, 123, .000, .41
Negative changes	Mean or % (S.E.)	Mean or % (S.E.)	Mean or % (S.E.)	Mean or % (S.E.)	Mean or % (S.E.)	Mean or % (S.E.)
None/ Not applicable	77.4 (3.8)	79.0 (3.7)	66.1 (4.3)	87.9 (2.9)	83.1 (3.4)	95.2 (1.9)
Slight or Moderate	21.0 (3.7)	16.9 (3.4)	29.0 (4.1)	8.9 (2.6)	14.5 (3.2)	4.0 (1.8)
Marked or Extreme	1.6 (.01)	4.0 (1.8)	4.8 (1.9)	3.2 (1.6)	2.4 (1.4)	0.8 (0.8)
Mean negative changes	0.29 (.05)	0.34 (.07)	0.54 (.08)	0.21 (.06)	0.27 (.06)	0.07 (.03)
T-test: mean negative > 0	t, df p, *d*	t, df p, *d*	t, df p, *d*	t, df p, *d*	t, df p, *d*	t, df p, *d*
	5.31, 123, .000., -.48	5.01, 123, .000, -.45	6.78, 123, .000, -.61	3.51, 123, .000, -.31	4.31, 123, .000, -.39	2.22, 123, .014, -.20
Net positive change (positive minus negative)	Mean (S.E.)	Mean (S.E.)	Mean (S.E.)	Mean (S.E.)	Mean (S.E.)	Mean (S.E.)
Mean net positive change	2.41 (.14)	2.0 (.13)	1.26 (.16)	1.03 (.15)	0.76 (.15)	0.43 (.12)
T-test: mean net positive > 0	t, df p, *d*	t, df p, *d*	t, df p, *d*	t, df p, *d*	t, df p, *d*	t, df p, *d*
	17.4, 123, .000, 1.56	15.1, 123, .000, 1.36	7.99, 122, .000, .72	6.85, 123, .000, .62	5.09, 123, .000, .46	3.67, 123, .000, .33

Shaded cells report test results; unshaded cells report percentages or means. The survey item stated, “As a result of your change efforts, indicate the positive (negative) changes you have noticed in the following areas.” Response options were “Not applicable”, “Not at all”, “Slightly”, “Moderately”, “Markedly”, or “Extremely so” [sic]. S.E., Standard Error; C.I., Confidence Interval; t, t-statistic; df, degrees of freedom; p, p-value (one-tailed test); *d*, Cohen’s d (effect size). Column percentages may not total exactly 100 due to rounding.

Table 10. Reported positive changes in psychosocial function in the present study compared with the findings of Karten & Wade (2010)

	Self-esteem	Social Functioning	Depression	Self-Harm	Suicidality	Alcohol/ Substance Abuse
	Mean (S.D.)	Mean (S.D.)	Mean (S.D.)	Mean (S.D.)	Mean (S.D.)	Mean (S.D.)
Present Study Mean	3.72 (1.18)	3.40 (1.16)	3.07 (1.33)	2.95 (1.52)	2.74 (1.63)	2.51 (1.73)
Comparison Study Mean	4.24 (.88)	4.04 (.92)	3.88 (1.07)	2.88 (1.12)	3.88 (1.49)	3.26 (1.65)
Difference	.52	.64	.81	-.07	1.14	.75
T-test: difference = 0	t, df, p	t, df, p	t, df, p	t, df, p	t, df, p	t, df, p
	3.87, 122, .000	4.78, 240, .000	4.88, 212, .000	.325, 154, .746	4.38, 142, .000	2.01, 41, .048

Shaded cells report test results; unshaded cells report mean values. The survey item stated, “As a result of your change efforts, indicate the positive changes you have noticed in the following areas.” Response options with codes were “Not Applicable (0)”, “Not at all (1)”, “Slightly (2)”, “Moderately (3)”, “Markedly (4)”, or “Extremely” (5). S.D., Standard Deviation; t, t-statistic; df, degrees of freedom; p, p-value.