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Emotions and decision rightness over five years following an abortion: An examination of decision difficulty and abortion stigma

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ABSTRACT

Background: Despite weak theoretical grounding and ample research indicating women feel high levels of decision rightness and relief post-abortion, claims that abortion is inherently stressful and causes emergent negative emotions and regret undergirds state-level laws regulating abortion in the United States. Nonetheless, scholarship does identify factors that put a woman at risk for short-term negative postabortion emotions—including decision difficulty and perceiving abortion stigma in one's community—pointing to a possible mechanism behind later emergent or persistent post-abortion negative emotions.

Methods: Using five years of longitudinal data, collected one week post-abortion and semi-annually for five years from women who sought abortions at 30 US facilities between 2008 and 2010, we examined women's emotions and feeling that abortion was the right decision over five years ($n=667$). We used mixed effects regression models to examine changes in emotions and abortion decision rightness over time by decision difficulty and perceived community abortion stigma.

Results: We found no evidence of emerging negative emotions or abortion decision regret; both positive and negative emotions declined over the first two years and plateaued thereafter, and decision rightness remained high and steady (predicted percent: 97.5% at baseline, 99.0% at five years). At five years postabortion, relief remained the most commonly felt emotion among all women (predicted mean on 0-4 scale: 1.0; 0.6 for sadness and guilt; 0.4 for regret, anger and happiness). Despite converging levels of emotions by decision difficulty and stigma level over time, these two factors remained most important for predicting negative emotions and decision non-rightness years later.

Conclusions: These results add to the scientific evidence that emotions about an abortion are associated with personal and social context, and are not a product of the abortion procedure itself. Findings challenge the rationale for policies regulating access to abortion that are premised on emotional harm claims.

1. Introduction

In the later decades of the twentieth century, opponents of abortion put forward an argument against access to legal abortion premised on the idea that abortion harms women by causing negative emotions and regret (for detailed discussion, see [APA Task Force on Mental Health and Abortion, 2008](#); [Kelly, 2014](#); [Siegel, 2008](#); [Steinberg and Finer, 2011](#)). The theoretical grounding for this proposed phenomenon is only weakly established ([Charles et al., 2008](#)); it typically relies on a framework founded on paternalistic, and often religious, beliefs about women's "nature" and supposedly innate maternal desire that constructs abortion as inherently stressful ([Kelly, 2014](#); [Lee, 2001](#); [Siegel, 2008](#)). Analyses testing this conceptual framework, named the "abortion-as-trauma" framework, as an explanation for post-abortion psychological health have found no rigorous support for it ([APA Task Force on Mental Health and Abortion, 2008](#); [Steinberg and Finer, 2011](#)). Nonetheless, in recent years, this assertion has undergirded United

States (U.S.) court decisions ([Siegel, 2008](#)) as well as the development and passage of state-level laws in the U.S. regulating abortion ([Coleman, 2006](#)). In eight states, for example, state-mandated materials that every abortion patient receives include claims that abortion causes lasting emotional (and mental health) harm ([Guttmacher Institute, 2019](#)). Similarly, 27 states require patients seeking an abortion to wait a specified period of time, usually 24 hours, to ensure that they have had sufficient time to decide if abortion is right for them ([Khazan, 2015](#)), a rationale premised on the assumption that regret is likely.

Nonetheless, scholars—as well as some antiabortion advocates ([Koop 1989](#))—who have investigated this possibility have consistently found no evidence that abortion is associated with either short term ([APA Task Force on Mental Health and Abortion, 2008](#); [Major et al., 2000](#); [Rocca et al., 2013](#)) or longer term negative emotions ([Broen et al., 2004](#); [Broen et al., 2005](#); [Kero et al., 2004](#); [Miller, 1992](#); [National Academy of Sciences, 2018](#); [Rocca et al., 2015](#)). Instead, as previous analyses of earlier subsets of the data analyzed here show, feelings of

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relief predominate among women who have obtained an abortion in the week following the abortion (Rocca et al., 2013), and all emotions decline in intensity over the three years after the abortion (Rocca et al., 2015). This same study also found no evidence that significant numbers of women regret their abortion decisions; 95% of women reported that abortion was the right decision three years after their abortion (Rocca et al., 2015). One other longitudinal study of post-abortion emotions, albeit examining overall means among a small sample of Norwegian women, has found that relief predominates five years out (Broen et al., 2005). Importantly, medical health experts argue, and research supports, that experiencing negative emotions or believing an abortion was not the right decision are not mental health problems, but rather expected reactions to a significant event and inevitable among individuals making medical and life decisions (APA Task Force on Mental Health and Abortion, 2008; National Academy of Sciences, 2018; Rocca et al., 2013; Watson, 2014).

Nonetheless, scholarship does identify factors associated with short-term negative post-abortion emotions, pointing to testable hypotheses for what might also be important for shaping longer-term emotions post-abortion. Previous research, for example, points to difficulty with the abortion decision and experiences of social disapproval as contributing to women's post-abortion emotional difficulty (Kimport, 2012; Kimport et al., 2011; LaRoche and Foster, 2017; Major and Gramzow, 1999). Consistent with these findings, our prior analyses (Rocca et al., 2013, 2015) found that difficulty deciding to obtain an abortion and perceiving community abortion stigma were risk factors for negative emotions immediately after the abortion. Other studies have likewise identified perceived abortion stigma as important to psychological health (which is distinct but related to emotions). For instance, a 2016 study by Steinberg et al. found that perceived abortion stigma was an important predictor of pre-abortion psychological health (Steinberg et al., 2016), which an earlier analysis by Steinberg and Finer (2011) showed was the strongest predictor of post-abortion psychological health. To the extent post-abortion psychological health and post-abortion emotions are related, those findings offer additional support for analysis of the role of perceived community abortion stigma in post-abortion emotions. To date, no research has examined how women's emotional response to abortion (and belief about decision rightness) might be affected in the long term by perceived abortion stigma and difficulty deciding.

Prior analyses of these data have shown declining emotions over three years' post-abortion, with no differences by the gestational timing of the abortion (Rocca et al., 2015). Here, we build on those findings, addressing two objectives. First, we extend the literature on women's feelings about an abortion to examine change over five years, including identifying whether negative (or positive) emotions emerge, the most prevalent emotions over time, and the degree to which women feel abortion was the right decision five years later. Second, we examine whether two key aspects of women's personal circumstances and social environment that have been shown to elevate negative emotions immediately after abortion, abortion decision difficulty and perceived abortion stigma in the community, also operate as risk factors for emergent or persistent negative emotions and/or feeling that abortion was not the right decision. This study adds to the literature by providing data from a nation-wide, five-year longitudinal, prospective analysis of women's post-abortion emotions, as well as by examining a possible mechanism for any emergence of negative emotions, including regret, both of which can inform policy-making around the regulation of abortion.

2. Method

We analyzed data from the Turnaway Study, a longitudinal study investigating the health and socioeconomic consequences of receiving or being denied an abortion in the US. Between January 2008 and December 2010, we recruited 956 women seeking an abortion from 30

geographically diverse US facilities. Facilities were included based on having the highest abortion gestational limit – ranging from ten weeks through the end of the second trimester – within 150 miles (Gould et al., 2012). The gestational limits differed due to varying state laws and regulations as well as facility and clinician policies.

The main aim of the Turnaway Study was to compare outcomes among women obtaining later abortions (Near-Limit Abortion group) to women who were too far along in pregnancy to receive an abortion at the facility where they sought care (Turnaway group), and women having first-trimester procedures at the same facilities (First-Trimester Abortion group). For this analysis, we include participants in the two groups who had the abortion; we exclude the Turnaway group because we could not assess emotions about the abortion or whether abortion was the right decision among women who did not have the abortion. Women presenting for pregnancy termination were eligible if they were English- or Spanish-speaking, at least 15-years old, and had a pregnancy with no known fetal anomalies. After giving potential participants study information and the informed consent form, facility staff connected them by telephone to study staff, who described the study and obtained verbal consent over the phone. Facility staff then collected the signed consent form and faxed it to a confidential fax line to the research director. Written parental or guardian consent was obtained for minors presenting for abortion in states where parental consent was required by law for abortion care. The study was approved by the University of California, San Francisco, Committee on Human Research.

Analyses include eleven waves of phone interview data, conducted at baseline – approximately eight days after care-seeking – and semi-annually thereafter for five years. Baseline interviews asked about sociodemographic characteristics and pregnancy and abortion circumstances, including decision difficulty and perceived community abortion stigma. All interviews asked about emotions and decision rightness. Women received \$50 gift cards after each interview. Five-year interviews were completed in January 2016. Overall, 37.5% of eligible women consented to participate, and 85% of those women completed baseline interviews ($n = 956$). Among those, 93% completed at least one follow-up interview, and 71% completed an interview in the final two years of the study.

2.1. Measures

Outcomes. *Abortion emotions* were assessed at all interviews with questions asking the degree to which participants had felt each of six emotions (relief, happiness, regret, guilt, sadness, anger) about the abortion in the prior week (not at all, a little, moderately, quite a bit, extremely). We examined each emotion individually as a continuous measure. We focused primarily on relief and sadness in analyses because these were the most commonly expressed positive and negative emotions at one week (Rocca et al., 2013). To summarize overall emotions, we summed responses to negative and positive emotions items, resulting in scales ranging from 0 to 16 ($\alpha = 0.89$) and 0–8 ($r = 0.57$), respectively. We then classified four emotional states: primarily positive emotions (0–3 on the negative scale, > 3 on the positive scale), primarily negative emotions (> 3 on the negative scale, 0–3 on the positive scale), low emotions (0–3 on both scales), and mixed emotions (> 3 on both scales). We used the same cut-point for both scales to be particularly sensitive to negative emotions.

Decision rightness was assessed at all interviews by asking participants whether, given the situation, the decision to have an abortion was right for them (yes, no, don't know). “Don't know” responses were categorized together with “no” for analyses to be conservative.

Independent variables. Our primary independent variable was abortion *decision difficulty*, measured at baseline with a question asking the participant how difficult it was for her to decide whether to have an abortion (very easy, somewhat easy, neither easy nor difficult, somewhat difficult, very difficult). For analyses, we collapsed the first three options and used a three-category variable (not difficult, somewhat

difficult, very difficult).

Our secondary independent variable of interest, *perceived community abortion stigma*, was assessed at every interview with a question asking participants how much they felt they would be looked down upon by people in their communities if they knew they had sought an abortion (not at all, a little bit, moderately, quite a bit, extremely). For analyses, we collapsed “a little bit” and “moderately” – as well as “quite a bit” and “extremely” – to create a three category variable (no stigma, low stigma, and high stigma community). A separate question similarly assessed *perceived personal abortion stigma* by asking the participant whether the people close to her would look down upon her if they knew she had sought an abortion. Because perceived community and personal abortion stigma were highly correlated, we focused on community abortion stigma in analyses.

Finally, *time* was assessed continuously as years from recruitment. Decision difficulty-by-time interaction terms were created to assess differential emotional trends over time between women reporting different baseline levels of decision difficulty. Similarly, stigma-by-time interactions assessed differential time trends in outcomes by community stigma.

Covariables. Sociodemographic characteristics were included to control for potential confounding of the primary relationships between decision difficulty, abortion stigma, and emotions, selected based on a directed acyclic graph delineating hypothesized relationships between our two independent variables of interest and outcomes. Baseline variables included *age* (years), self-reported *race/ethnicity* (non-Latina white, non-Latina black, Latina, other), *study group* (Near-Limit, First-Trimester), and *history of depression or anxiety*, using questions from the Composite International Diagnostic Interview (Kessler Ronald and Üstün, 2006). We also included a baseline measure of *pregnancy intention*, using the London Measure of Unplanned Pregnancy (range: 0–12; $\alpha = 0.53$) (Barrett et al., 2004). Additionally, we incorporated time-varying covariables that could confound our relationships of interest, including the number of children the participant was raising (0, 1, 2 or more), and whether the participant was *in a relationship with the man involved in the pregnancy* (MIP). Social support was assessed using six items derived from the Multidimensional Scale of Perceived Social Support evaluating interpersonal support from family and friends (range: 0–4; $\alpha = 0.80$) (Harris et al., 2014; Zimet et al., 1988).

2.2. Analyses

Among participants enrolled into the Near-Limit and First-Trimester Abortion groups ($n = 725$), we excluded from analyses participants recruited from one site at which all but one Turnaway group participant received an abortion elsewhere ($n = 55$). After excluding two Near-Limit participants and one First-Trimester participant who decided not to terminate their pregnancies, the final sample size for this analysis was 667. All 667 participants contributed data to models regardless of length of follow-up, including if lost after baseline.

We described the analytic sample and compared baseline sociodemographic characteristics among decision difficulty groups by fitting bivariable regression models, including random facility effects to account for clustering of participants within facilities. Depending on the measurement of the characteristic, we used linear, logistic, multinomial logistic, or ordinal logistic models.

To examine how trajectories of emotions over time differed by decision difficulty, we fit a series of mixed effects regression models including random intercepts for facility and participant in each model to account for clustering. Random time effects were included to allow emotion trajectories to differ across participants. We fit separate models for each of the six emotions. For each model, we sought appropriate functional forms for time by adding quadratic and cubic terms and assessing the statistical significance of the added terms. Decision difficulty-by-time interaction terms were included to capture change in emotions over time by decision difficulty group. To describe the

distribution of participants in each overall emotions category over five years, we fit a multivariable random effects multinomial logistic regression model using structural equation modeling, reporting predicted percentages at each time point from this model.

Finally, we investigated whether women felt abortion was the right decision for them and differences by decision difficulty by fitting a logistic mixed effects model, again with random facility and participant intercepts, random time effects, and decision difficulty-by-time interaction terms. No quadratic or cubic time terms were needed for this model. To identify factors associated with decision rightness only in the final two years of the study, we fit a final multivariable mixed effects model with random facility and participant intercepts, restricting observations to years three through five of the study. To examine how emotions over five years differed by perceived community abortion stigma, we similarly fit models assessing individual emotions, overall emotions, and decision rightness, with perceived stigma as the independent variable.

Based on prior analyses indicating emotions through three years did not differ by study group, we included Near-Limit and First-Trimester groups together in analyses and controlled for study group in models. Because it was unclear to us whether pregnancy intention and social support were truly confounders or were instead part of the same causal pathways being examined, we conducted sensitivity analyses fitting all models without these covariables, as well as without covariables. We also repeated analyses using multiple imputation with chained equations applied to account for missing covariable data (< 0.01% of observations for any variable).

To assess whether differential loss-to-follow-up might have affected results, we conducted attrition analyses, assessing whether those remaining in the sample during the final two years of the study (years four and five) differed from those lost by baseline decision difficulty, perceived stigma, and emotions outcomes using a series of random effects logistic regression models with random facility effects. We also assessed if attrition was differential by decision difficulty and stigma within category of each outcome (e.g. by stigma category among those reporting abortion was the right decision). Analyses were conducted with Stata v.15 (College Station, TX).

3. Results

Participants were on average 25-years old at baseline (Table 1). Overall, 35% were non-Latina white, 32% were non-Latina black, 21% were Latina, and 13% were of other races/ethnicities. Sixty-two percent were raising children. Mean pregnancy planning scores were low (2.8 on a 0–12 scale), and mean gestation was 15 weeks.

About half of participants felt that deciding to have the abortion was very difficult (27%) or somewhat difficult (27%), while almost half felt it was not a difficult decision (46%) (Table 1). Those who had more difficulty deciding were more likely to be raising children already and less likely to be raising no children, compared to those reporting no difficulty ($p < 0.01$). Those who expressed more difficulty deciding had higher pregnancy planning scores ($p < 0.001$), had more negative feelings about the pregnancy ($p < 0.001$), and were more likely to be seeking near-limit abortions ($p = 0.003$). Finally, decision difficulty at baseline increased with higher levels of perceived abortion stigma in their community: among those reporting the decision was very difficult, 45% perceived high levels and 26% perceived no stigma; these figures were 24% and 46%, respectively, among those having no difficulty. There were no differences in difficulty deciding by participant age, race, education, or history of depression/anxiety.

At baseline, a week after the abortion, over half of the full sample expressed feeling mostly positive emotions (predicted percent = 51%), with 20% feeling none/few emotions, 17% feeling mostly negative emotions, and 12% feeling both negative and positive emotions (Fig. 1). Over time, the percentage of women expressing feeling none/few negative or positive emotions increased sharply, to 45% at one year and

Table 1
Sociodemographic characteristics by decision difficulty ($N = 667$).

	Not Difficult ($n = 309$)	Somewhat Difficult ($n = 180$)	Very Difficult ($n = 178$)	p -value	Total
	% or Mean (SD)				% or Mean (SD)
Age, mean years (SD)	24.8 (5.6)	25.4 (5.7)	26.0 (6.2)	0.096	25.3 (5.8)
Race/Ethnicity					
White	35.0	40.6	28.1	0.052	34.6
Black	34.0	27.2	32.0		31.6
Latina	18.1	20.6	27.0		21.1
Other	12.9	11.7	12.9		12.6
In a Relationship with the Man Involved with the Pregnancy Children ($n = 666$)	55.0	65.0	59.0	0.093	58.8
0	43.5	32.2	34.3	0.008	38.0
1	27.9	26.7	30.3		28.2
2+	28.6	41.1	35.4		33.8
Education					
< High School	19.1	18.3	14.0	0.852	17.5
HS or GED	33.0	31.7	34.3		33.0
Some College	39.2	41.7	43.8		41.1
College Degree	8.7	8.3	7.9		8.4
Diagnosis of Depression or Anxiety	26.9	25.0	31.5	0.320	27.6
Pregnancy planning, mean score (SD) (range: 0–12)	2.5 (1.4)	2.7 (1.5)	3.4 (2.1)	< 0.001	2.8 (1.7)
Social support, mean score (SD) (range: 0–4) ($n = 661$)	3.3 (0.6)	3.3 (0.6)	3.2 (0.7)	0.191	3.2 (0.7)
Negative feelings about pregnancy, mean score (SD) (range: 0–16) ($n = 658$)	4.8 (4.4)	6.1 (4.5)	7.4 (4.6)	< 0.001	5.8 (4.6)
Perceived Community Abortion Stigma					
None	46.3	42.2	25.8	< 0.001	39.7
Low	29.8	29.4	29.2		29.5
High	24.0	28.3	44.9		30.7
Perceived Personal Abortion Stigma ($n = 666$)					
None	49.0	40.6	29.2	< 0.001	41.4
Low	30.5	34.4	34.3		32.6
High	20.5	25.0	36.5		26.0
Gestation, mean weeks (SD) (range: 3–28)	14.5 (7.1)	14.8 (6.6)	16.4 (6.4)	0.004	15.1 (6.8)
Study Group					
Near-Limit abortion	56.0	62.2	71.9	0.003	61.9
First-Trimester abortion	44.0	37.8	28.1		38.1

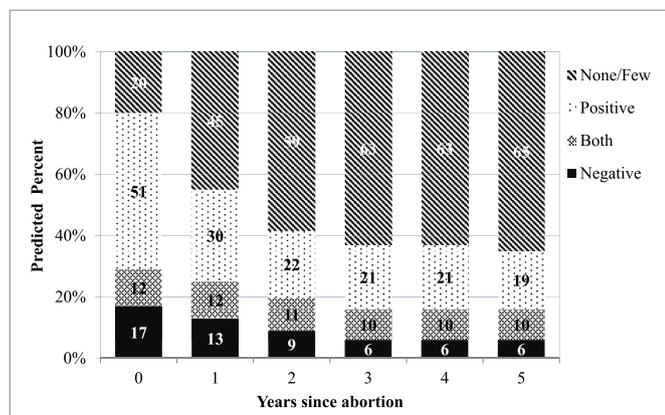


Fig. 1. Post-abortion emotions profiles over 5 years. Bars represent the predicted percent of participants fitting each emotions profile by year since abortion.

63% at three years, plateauing thereafter. By five years' post-abortion, the large majority of women (84%) had either primarily positive emotions or no emotions whatsoever about their abortion decision, and 6% expressed primarily negative emotions. We found no evidence of emergent negative or positive emotions.

3.1. Emotions and decision difficulty

Women who reported that the abortion decision was very difficult

reported feeling more sadness a week after the abortion (predicted mean = 2.1 on 0–4 scale) than those reporting no difficulty (predicted mean = 0.7) (adjusted β ($a\beta$) = 1.4, 95% CI: 1.2, 1.6) (Table 2). Over time, however, the intensity of feeling sadness declined significantly for all groups, with sharper declines over the first and second year post-abortion, and sadness stabilizing thereafter through five years (Fig. 2). Feelings of sadness declined more sharply among those reporting more difficulty deciding ($p < 0.001$). By five years, sadness had largely converged for the three difficulty groups (very difficult: predicted mean = 0.8; somewhat difficult: 0.7; not difficult: 0.5); only those finding the decision very vs. not difficult remained significantly different from one another at five years ($p = 0.02$).

Examining relief, compared to those reporting no difficulty deciding (predicted mean = 2.9), women who reported the abortion decision was very difficult reported feeling less relief one week after the abortion (predicted mean = 2.0, $a\beta = -0.9$, 95% CI: $-1.1, -0.7$). Over time, the intensity of relief declined significantly among all groups, with the most precipitous declines over the first two years' post-abortion. Levels of relief were no longer significantly different among decision difficulty groups by three years (somewhat vs. none) and four years (very vs. none) and continued to converge thereafter. At five years, relief levels were no different for the groups (0.9 very vs. 1.0 somewhat and not difficult).

Trajectories of anger, guilt, regret, and happiness followed similar patterns as for sadness and relief (Fig. 2). Notably, relief remained the most commonly felt emotion by participants at all time points. At five years' post-abortion, the overall predicted mean relief level about the abortion was 1.0 on the 4-point scale, compared to 0.6 for sadness, 0.6 for guilt, 0.4 for regret, 0.4 for anger, and 0.4 for happiness.

Table 2
Post-abortion emotions by difficulty deciding and time over 5 years ($N = 667$).

	Sadness		Relief	
	$a\beta$	95% CI	$a\beta$	95% CI
Decision Difficulty				
Not Difficult	Reference		Reference	
Somewhat Difficult	0.67***	0.49, 0.85	-0.41***	-0.66, -0.17
Very Difficult	1.40***	1.22, 1.59	-0.85***	-1.10, -0.60
Years				
Somewhat Difficult \times Years	-0.17*	-0.34, -0.01	-1.54***	-1.77, -1.31
Very Difficult \times Years	-0.52***	-0.79, -0.25	0.28	-0.10, 0.65
Years²				
Somewhat Difficult \times Years ²	-0.93***	-1.20, -0.66	0.42*	0.04, 0.80
Very Difficult \times Years ²	0.03	-0.05, 0.11	0.47***	0.36, 0.58
Years³				
Somewhat Difficult \times Years ³	0.16*	0.03, 0.29	-0.10	-0.28, 0.09
Very Difficult \times Years ³	0.28***	0.15, 0.41	-0.09	-0.28, 0.09
Years³				
Somewhat Difficult \times Years ³	0.00	-0.01, 0.01	-0.05***	-0.06, -0.03
Very Difficult \times Years ³	-0.02	-0.03, 0.00	0.01	-0.01, 0.04
	-0.03**	-0.04, -0.01	0.01	-0.02, 0.03

Note. Models control for study group, age, race, children, depression/anxiety, social support, pregnancy planning, in relationship with the man involved, and stigma. $a\beta$ = adjusted beta.

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.

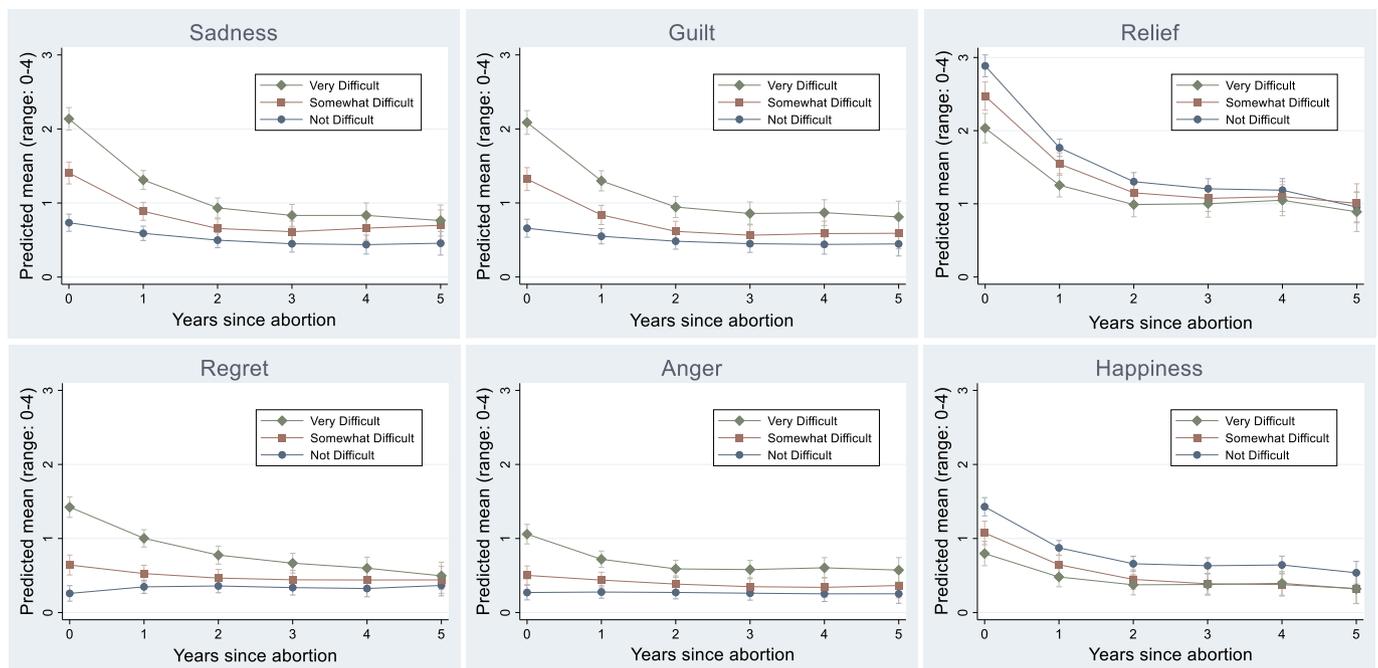


Fig. 2. Post-abortion sadness, regret, guilt, anger, relief, and happiness, over 5 years. Lines represent the predicted mean emotion score over time, by participants' reported level of difficulty making the abortion decision.

3.2. Emotions and perceived community abortion stigma

At baseline, 31% of the sample reported high perceived stigma (people in their community would look down on them for having sought an abortion) and 30% reported low perceived stigma, while 40% perceived no community abortion stigma. In approximately half of interviews after baseline, women reported a different level of perceived stigma than they had at baseline. Levels of sadness felt one week post-abortion were higher among those perceiving high and low stigma in their communities (predicted mean = 1.6 and 1.3, respectively) than those who perceived no stigma (predicted mean = 1.0) ($a\beta = 0.6$, 95% CI: 0.4, 0.8; $a\beta = 0.3$, 95% CI: 0.1, 0.4, respectively) (Table 3). At five years, sadness scores had declined significantly to less than half than baseline scores for women in the three perceived stigma groups (high: predicted mean = 0.7; low: 0.8; none: 0.5) and were not different from

one another. In contrast, women in the perceived stigma groups felt similar levels of relief felt one week post-abortion (predicted mean = 2.6 for high stigma, 2.6 for low, 2.5 for none). By five years, mean relief scores were 1.1 for low perceived stigma, and 0.9 for high and no stigma, and remained similar.

We found similar patterns for the other negative emotions (guilt, anger, regret) as for sadness. At five years, only anger was significantly higher for those perceiving high abortion stigma in their communities than for those perceiving no stigma. Interestingly, regarding happiness, women perceiving high (predicted mean = 1.3) and low (1.2) stigma felt higher levels of happiness at baseline than those perceiving no stigma (1.0) (high: $a\beta = 0.3$, 95% CI: 0.1, 0.5; low: $a\beta = 0.2$, 95% CI: 0.0, 0.4, vs. none). By six months, however, degrees of happiness did not differ by level of perceived stigma.

Table 3Post-abortion emotions by perceived community abortion stigma and time over 5 years ($N = 667$).

	Sadness		Relief	
	$a\beta$	95% CI	$a\beta$	95% CI
Stigma				
None	Reference		Reference	
Low	0.27***	0.11, 0.43	0.05	-0.17, 0.26
High	0.60***	0.43, 0.75	0.16	-0.06, 0.38
Years	-0.53***	-0.69, -0.36	-1.35***	-1.59, -1.12
Low stigma \times Years	0.13	-0.14, 0.41	0.12	-0.27, 0.51
High stigma \times Years	0.13	-0.16, -0.43	-0.08	-0.49, 0.34
Years²	0.18***	0.10, 0.25	0.42***	0.32, 0.53
Low stigma \times Years ²	-0.14*	-0.27, 0.00	-0.07	-0.25, 0.12
High stigma \times Years ²	-0.13	-0.27, 0.02	0.07	-0.14, 0.27
Years³	-0.02***	-0.03, -0.01	-0.04***	-0.06, -0.03
Low stigma \times Years ³	0.02*	0.00, 0.04	0.01	-0.01, 0.03
High stigma \times Years ³	0.02	0.00, 0.04	-0.01	-0.04, 0.02

Note. Models control for study group, age, race, children, depression/anxiety, social support, pregnancy planning, in relationship with the man involved, and decision difficulty. $a\beta$ = adjusted beta.

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.

3.3. Decision rightness and decision difficulty

In raw data, approximately 95% of participants reported at each data collection wave through five years that having the abortion was the right decision. Using the full five years of data, one week after the abortion, the predicted percentage reporting that having the abortion was the right decision was 97.5% overall. This percentage increased slightly but insignificantly ($p = 0.25$) over time to 99.0% at five years.¹ Women who reported having no difficulty or some difficulty making the abortion decision were more likely to report that the abortion was the right decision at one week (predicted percentage = 99.6% and 98.9%, respectively), compared to those for whom the decision was very difficult (94.6%, adjusted odds ratio (aOR) = 0.06, 95% CI: 0.02, 0.16 for very difficult vs. not) (Table 4, Fig. 3). Over time, the odds of women saying the abortion was right for them increased gradually and insignificantly each year among those who had no difficulty ($aOR = 1.22$ per year, 95% CI: 0.87, 1.73); only the trajectory of those reporting the decision was very difficult increased significantly over time ($p = 0.02$). Five years' post-abortion, the percentages feeling abortion was the right decision were 99.8% (not difficult), 99.6% (somewhat), and 97.9% (very); these percentages were no different between those finding the decision to be somewhat difficult vs. not difficult, but remained lower for those who found the decision to be very difficult ($p < 0.01$ vs. not difficult).

3.4. Decision rightness and perceived community abortion stigma

One week post-abortion, decision rightness did not differ by perceived level of abortion stigma in women's communities (Table 4): women perceiving no stigma were similarly likely to report abortion

¹ The percentages reported here differ slightly from prior reports due to different analysis samples and covariable inclusion. The 99% overall three-year decision rightness figure reported in Rocca et al. (2015) was derived using the first three years of data ($n = 3,758$ observations); multivariable logistic random effects models examined average individual-level intercepts controlled for mean-centered covariables equal to zero, selected based on confounding the relationship between study group and decision rightness. The 97.5% and 99.0% baseline and five-year figures reported here were derived using the full five years of data ($n = 5,550$ observations); multivariable logistic random effects models controlled for covariables, selected based on confounding the relationships between decision difficulty/perceived stigma and decision rightness. For both analyses, the raw percentage reporting abortion was the right decision, not accounting for individual trajectories, covariables, missing data, nor loss to follow-up, was approximately 95% at all time-points.

Table 4Post-abortion decision rightness by decision difficulty, perceived community abortion stigma, and time over 5 years ($N = 667$).

	Model 1		Model 2	
	aOR	95% CI	aOR	95% CI
Years	1.22	0.87, 1.73	1.45**	1.12, 1.87
Decision Difficulty				
Not Difficult	Reference			
Somewhat Difficult	0.34*	0.12, 0.98		
Very Difficult	0.06***	0.02, 0.16		
Decision Difficulty \times Years				
Somewhat Difficult \times Years	1.06	0.73, 1.54		
Very Difficult \times Years	1.06	0.76, 1.47		
Stigma				
None			Reference	
Low			0.79	0.38, 1.61
High			0.59	0.28, 1.23
Stigma \times Years				
Low \times Years			0.82	0.62, 1.09
High \times Years			0.76	0.56, 1.01

Note. Models control for study group, age, race, children, depression/anxiety, social support, pregnancy planning, and in relationship with the man involved. Model 1 controls for stigma; Model 2 controls for decision difficulty. Reference group is participants responding "don't know" or "no" regarding if abortion was the right decision. aOR = adjusted odds ratio.

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.

was the right decision (98.0%) as those perceiving low (97.5%) or high (96.8%) levels of stigma. The odds of reporting the decision was right increased significantly each year among those with no perceived abortion stigma ($aOR = 1.45$, 95% CI: 1.12, 1.87), with similar patterns of decision rightness among those perceiving low or high stigma. Despite the trend of increasing decision rightness across all participants regardless of the perceived stigma level of their communities, those who reported perceiving high stigma beginning two years after the abortion had lower levels of decision rightness compared to those perceiving no stigma. Beginning at three years' post-abortion, those perceiving low stigma in their communities had lower levels of decision rightness. At five years' post-abortion, the percentages feeling abortion was the right decision were 99.5% (no stigma), 98.7% (low stigma), and 97.7% (high stigma).

In the model examining factors associated with decision rightness in the final two years of the study, only three factors were associated significantly. Women who found the abortion decision to be very

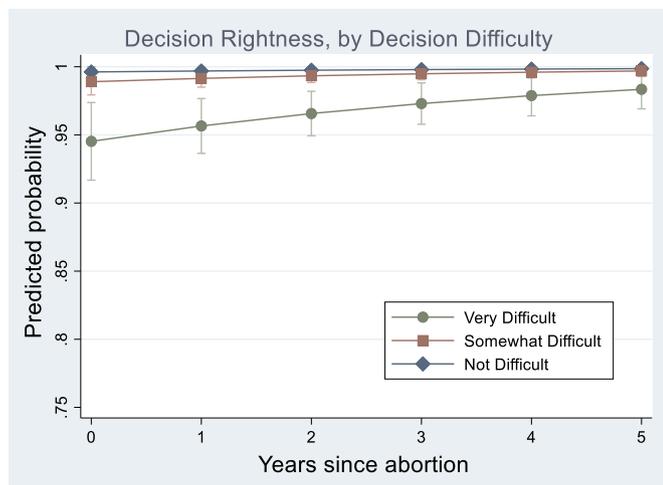


Fig. 3. Post-abortion decision rightness over 5 years. Lines represent the predicted probability of reporting abortion was the right decision (vs. “don’t know” or not the right decision) over time, by participants’ reported level of difficulty making the abortion decision.

difficult ($aOR = 0.05$, 95% CI : 0.01, 0.23 vs. not difficult), women with more intended pregnancies ($aOR = 0.64$, 95% CI : 0.49, 0.88), and women perceiving low or high community abortion stigma ($aOR = 0.35$, 95% CI : 0.14, 0.89 and $aOR = 0.11$, 95% CI : 0.04, 0.32, respectively) had significantly reduced odds of feeling abortion was the right decision for them in the long-term. No sociodemographic characteristics nor study group were significantly associated with long-term decision rightness.

3.5. Sensitivity

Results were unchanged in models excluding pregnancy intention and social support, and excluding covariables, as well as when conducted using multiple imputation.

3.6. Attrition

Over 72% of participants were retained in the sample for the final two years of the five year study. Retention was non-differential by baseline emotions, decision rightness, decision difficulty, and perceived abortion stigma. Retention was also non-differential by decision difficulty and stigma within those reporting each outcome.

4. Discussion

In this five-year longitudinal study of 667 women having abortions across 21 states, the presence and intensity of all emotions felt about the abortion – both negative and positive – declined with time, with the sharpest declines in the first year and emotions plateauing between two and five years (see Figs. 1 and 2). In addition, the predicted percent of women reporting that the abortion was the right decision increased gradually from over 97% one week post-abortion to 99% at five years (see Fig. 3). Extending existing research showing high levels of reports that abortion was the right decision immediately (APA Task Force on Mental Health and Abortion, 2008; Major et al., 2000; Rocca et al., 2013) and up to three years after the abortion (Broen et al., 2004, 2005; Kero et al., 2004; Miller, 1992; Rocca et al., 2015), we found no evidence of emergent negative or positive emotions over the five years following the abortion, demonstrating no support for claims that abortion causes negative emotions or that women typically come to regret their abortions. Indeed, at all time points, relief was the most commonly felt emotion (see Fig. 2), consistent with the body of literature on women’s emotions in the short-term after an abortion (APA

Task Force on Mental Health and Abortion, 2008; Major et al., 2000; Rocca et al., 2013).

In examining two factors associated at baseline with negative emotions—decision difficulty and perceived community abortion stigma—we found diminished differences over time post-abortion. While the half of women who reported that the abortion decision was very or somewhat difficult to make experienced more negative emotions than those who had no difficulty initially, the intensity of these women’s emotions declined over five years to levels consistent with women who did not find the decision to be difficult (see Fig. 2). Similarly, while the 60% of women perceiving high or low levels of community abortion stigma had elevated negative emotions at baseline, compared to those perceiving no stigma, there were no differences in emotions by perceived stigma at five years.

In contrast, although the differences in decision rightness among women who reported the abortion decision was very difficult vs. not difficult at baseline also attenuated over time, women who found the decision to be very difficult still reported lower decision rightness at five years (see Fig. 3). Regarding perceived community abortion stigma, although decision rightness was steady or increased across time points for all levels of perceived stigma, differences in decision rightness by perceived stigma group emerged at two to three years post-abortion: at three years and beyond, those perceiving high and low stigma had lower levels of decision rightness compared to those perceiving no stigma. Results suggest that sociocultural context is important for women’s post-abortion assessment of their abortion decision, in line with research identifying the importance of perceived abortion stigma for pre-abortion psychological health (Steinberg et al., 2016) and offering support for a conceptual framework that understands abortion within a sociocultural context (APA Task Force on Mental Health and Abortion, 2008).

Despite the overall high numbers of women reporting that abortion was the right decision, when we examined the factors associated with ever reporting abortion was not the right decision (or “don’t know”) between three and five years, decision difficulty and perceived abortion stigma remained significant factors. This finding expands our prior result that decision difficulty and perceived community abortion stigma are most important in shaping emotions in the short term post-abortion (Rocca et al., 2013, 2015), and are the first to show they remain important years later. These factors are, notably, personal and social factors, providing further evidence that emotions and feeling that an abortion was not the right decision are associated with personal and social context, not associated with (or predicted by) demographics and not engendered by the abortion procedure itself.

4.1. Limitations

This study has limitations. Probing participants about their abortions twice annually over five years may have led to higher levels of feelings of emotions than they otherwise would have felt. Given this possibility, such an inflation effect would likely have affected participants non-differentially and, if anything, would likely have led to our underestimating the reductions in emotions over time we found. In addition, no formal scaled measures of abortion emotions, decision difficulty, nor perceived abortion stigma existed at the time of our study. We thus relied on individual items with categorical outcomes, which may not have validly captured these constructs. Furthermore, the emotions we assessed may not have captured all of the negative and positive emotions that might be relevant to women years after an abortion, particularly those related to deepened maturity or improved self-efficacy (Kero et al., 2004).

Finally, as we have discussed at length elsewhere (Rocca et al., 2015), the relatively low participation rate might elicit questions about selection bias. However, 38% enrollment into a five-year study among women seeking a stigmatized health service is in line with other large-scale studies, and we have no reason to believe women would select into the study based on how their emotions would change over five years.

This study has many important strengths. The study is the only investigation of abortion emotions and decision rightness to use a prospective design with a large cohort of women from diverse settings across the US for a full five years. The large sample included socio-demographically diverse women having abortions across the full range of gestations, which improves generalizability. Seventy-two percent of participants completed an interview in the final two years of the five year study, and our modeling approach accounted for attrition.

5. Conclusions

Over the five years after having an abortion, the intensity of negative and positive emotions about the abortion declined, particularly over the first year, with relief predominating at all times. The overwhelming majority of women felt that the abortion was the right decision for them at all times. Our findings challenge the rationale for state-mandated counseling protocols on post-abortion emotions and other policies regulating access to abortion premised on emotional harm claims (e.g. waiting periods).

Despite converging levels of emotions by decision difficulty and stigma level over time, these two factors remained most important for predicting negative emotions and decision non-rightness years later. Notably, however, while we can establish temporal associations between the variables we measured, we are unable to identify the actual causal mechanisms leading some individuals to experience negative emotions or decision regret. Indeed, future research should explore the possibility that the social discourse, perhaps including antiabortion discourse that assert negative emotional outcomes (Kelly, 2014), may itself contribute to the negative emotions it describes. In terms of clinical practice, findings do not offer evidence of a need for clinicians and other providers to specifically counsel women seeking abortions on post-abortion emotional trajectories, though they may offer support for interventions aimed at coping with community abortion stigma.

Findings are also of value for the development of future research studies that tackle longitudinal questions about emotions after abortion. As Charles et al. (2008) note, methodologically-appropriate studies examining such questions are resource-intensive. The consistency of decision rightness over time—and, indeed, the decrease in and plateauing of negative emotions and emotional intensity—documented here provide definitive support for the conclusion that abortion does not lead to emergent negative emotions.

CRedit authorship contribution statement

Corinne H. Rocca: Conceptualization, Data curation, Formal analysis, Methodology, Validation, Visualization, Writing - original draft. **Goleen Samari:** Data curation, Formal analysis, Methodology, Visualization, Writing - original draft. **Diana G. Foster:** Conceptualization, Data curation, Funding acquisition, Investigation, Methodology, Project administration, Supervision, Validation, Writing - review & editing. **Heather Gould:** Data curation, Investigation, Project administration, Validation, Writing - review & editing. **Katrina Kimport:** Conceptualization, Writing - original draft.

Declaration of competing interest

None.

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