

Evaluating the Effect of Treatment Satisfaction on Future Spending for Professional Cosmetic
Treatments Among Aesthetically Conscious U.S. Adults

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Abstract

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BACKGROUND: Professional cosmetic treatments are increasing in popularity within the United States, amounting to billions of dollars in annual spending on a wide variety of surgical and nonsurgical treatments combined. Since the decision to seek cosmetic treatment is largely patient-driven, treatment satisfaction is often a proxy for treatment success. Despite billions of dollars spent on treatments, prior research is limited to characterizing motivators to undergoing treatment with less regard to evaluating the spending component. Furthermore, much less is known regarding the relationship between cosmetic treatment spending and potential predictors like satisfaction.

OBJECTIVE: To assess the relationship between treatment satisfaction and future spending among aesthetically conscious U.S. adults receiving professional cosmetic treatments.

METHODS: We conducted a cross-sectional study using data collected between October and November of 2018 from the Beauty Image Assessment Survey (also known as "Beauty360"), a global, internet-based survey on aesthetic goals, experiences, and interests with cosmetic treatments. Eligible respondents were aesthetically conscious U.S. adults between 21 to 65 years old who received at least 1 cosmetic treatment in the past year. A regression analysis was conducted to assess the relationship between treatment satisfaction and future expected spend on cosmetic treatments, adjusted for demographics, past spending, treatment count, treatment type, and media exposure. Stratified and subgroup analyses were conducted for respondents who exclusively received nonsurgical treatments versus those who received at least 1 surgical treatment, and for respondents who received at least 1 wrinkle-relaxing and/or dermal filler injection. An exploratory analysis was conducted to identify significant predictors of treatment satisfaction.

RESULTS: A total of 474 aesthetically conscious U.S. respondents (mean age 43, 67.5% female) received cosmetic treatment within the past year prior to survey completion. Most respondents only received nonsurgical treatments (n=393, 82.9%) compared to those who received at least 1 surgical treatment (n=81, 17.1%), and less than one-third of respondents received at least 1 injectable treatment (n= 139, 29.3%). Among all eligible respondents, those satisfied with past treatment planned to spend an average of \$272 less on cosmetic treatments in the next year than those dissatisfied, after adjustment (95% CI -926.5 to 382.7, p = 0.415). However, this difference was not statistically significant. Satisfied respondents who exclusively received nonsurgical treatments planned to spend \$219 less on cosmetic treatments in the next

year than those who were dissatisfied (95% CI -612.4 to 173.8, $p= 0.273$), while satisfied respondents with at least 1 surgical treatment planned to spend \$191 more in the next year than those dissatisfied (95% CI -2179 to 2561, $p= 0.872$). Satisfied respondents with at least 1 injectable treatment planned to spend \$167 less than those dissatisfied (95% CI -2241 to 1907, $p=0.874$). However, none of the differences noted above were statistically significant. Predictors observed to influence satisfaction included annual household income ($p=0.010$), discretionary income level ($p= 0.034$), and total count of past treatments ($p=0.026$).

CONCLUSION: We did not find a statistically significant association between satisfaction with past treatments and plan to spend on cosmetic treatments in the following year. Significant predictors to treatment satisfaction identified included both household and discretionary incomes and number of past treatments received.

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1. Introduction

Professional cosmetic treatments are rising in popularity worldwide and in the United States.¹⁻³ The American Society for Plastic Surgery (ASPS) reported up to 18.4 million total procedures received in the United States, amounting to an estimated \$23.7 billion in spending.¹ Nonsurgical and noninvasive treatments account for over 85% of total cosmetic treatment counts, a majority of which are repeat or cyclical procedures received more frequently.^{4, 20, 22} A popular example includes botulinum toxin wrinkle-relaxing and hyaluronic acid dermal filler injections which typically last 3 to 6 months and 4 to 12 months, respectively, thus requiring repeated treatments to maintain results.^{21, 22} Nonsurgical procedures are often less costly per treatment than surgeries which typically require longer recovery periods to achieve long-term results.

Since the decision to seek treatment is largely patient-driven, satisfaction is a key factor in evaluating treatment success.¹⁷⁻¹⁸ Previous studies have identified age, gender, and amount of media exposure as influencers for both treatment satisfaction and the likelihood of undergoing treatment.^{10-11, 19} Despite billions of dollars spent on treatments, limited research has been published evaluating the spending component of cosmetic treatments and its relationship with potential predictors like satisfaction.

The growth of professional cosmetic treatments has increased the relevancy of understanding the patient perspective and identifying factors related to treatment success and spending.⁸ Therefore, the goal of the Beauty Image Assessment Survey (also known as “Beauty360”) was to closely examine and better understand the diverse and evolving perspectives of aesthetically-conscious people of varying ages, cultures, and genders.^{9, 16} This online survey conducted by Allergan plc in 18 different countries captured views on more than

14,500 “aesthetically conscious consumers” (those who self-identified as interested in looking better and willing to invest in it). Utilizing the Beauty 360 dataset of U.S. respondents and their responses to questions on past treatments received, treatment satisfaction, and spending habits, our study aimed to analyze the relationship between treatment satisfaction and future spend for professional cosmetic treatments. As an exploratory analysis, we also aimed to identify key predictors to treatment satisfaction among the same population.

2. Methods

2.1 Study Design

Our study was a cross-sectional study of 477 “aesthetically conscious” U.S. survey respondents 21 to 65 years old who completed the Beauty Image Assessment Survey between October 25 to November 29, 2018 and received ≥ 1 professional cosmetic treatment exclusively within the 12 months prior.

2.2 Data Source

The Beauty Image Assessment Survey is a global, internet-based, anonymous, cross-sectional survey administered by Ipsos Healthcare (Mahwah, NJ, USA), an independent global market research and consulting firm. The survey was sponsored by Allergan plc (Dublin, Ireland) prior to its acquisition by AbbVie Inc. Within each country, a maximum of 30% male and 70% female participants were eligible to complete the survey. Over 40 aspects of the face and body surveyed. The 20–30-minute survey focused on questions regarding desired appearance, treatment goals, and experiences with and/or interest in aesthetic treatments. Survey participants accumulated points to purchase items out of a catalog as compensation.⁸

2.3 Inclusion and Exclusion Criteria

2.3.1 Survey Eligibility

Eligible respondents for the global Beauty360 survey included adults between 21 to 65 years old residing in the United States. All respondents had to qualify as “aesthetically conscious participants” by agreeing to both statements of (1) “looking good at any age is important to me” and (2) “I am willing to go to a professional to improve my appearance.” Respondents also must agree that they cared about, were willing to invest in, and/or were prepared to invest in their overall appearance.

2.3.2 Study Eligibility

This cross-sectional study included respondents who received at least 1 professional nonsurgical and/or surgical cosmetic treatment only within the past 12 months of completing the survey (Figure 1). Respondents who received any treatment over 1 year prior to survey completion were excluded from our primary sample to eliminate potential recall bias. In addition, respondents who indicated blank responses for all professional cosmetic treatments listed were also excluded.

2.4 Variables of Interest

A summary table of all variables of interest and corresponding survey items, dataset variables, and possible responses are provided in the Supplementary Appendix (Table S1).

2.4.1 Types of Treatment Received

Respondents were stratified into two mutually exclusive groups based on types of treatments received out of a list of 42 treatment options: the “nonsurgical only” group who exclusively received ≥ 1 nonsurgical treatment, and the “surgical +/- nonsurgical” group who received ≥ 1 surgical treatment with or without an additional nonsurgical treatment (Table S2). A non-mutually exclusive subgroup was created to include respondents who had received at least 1 injectable wrinkle-relaxing or dermal filler treatment.

2.4.2 Respondent Characteristics

Respondent demographics were assessed as reported at the time of survey completion including age, gender, race, annual household income, discretionary income level, and geographic region. Annual household income was summarized as being below, at, or above the estimated 2018 median income level.²³ Other characteristics included overall treatment satisfaction, future estimated spend in U.S. dollars, and types of media sources for learning about beauty treatment(s) including print, broadcast, internet, or other sources (Table S3).

2.4.3 Primary Future Spend Outcome

The primary outcome of interest was estimated future spend on cosmetic treatments within the 12 months following survey completion. This was captured through a survey item asking respondents to estimate the total dollar amount they planned to spend on cosmetic treatments they considered receiving in the next year. The primary predictor variable was satisfaction with past treatment outcomes, which was captured through a 6-point Likert scale rating from “completely dissatisfied” to “extremely satisfied” based on how satisfied respondents were on the overall outcome of their cosmetic treatments.

2.4.4 Covariates and Exploratory Outcomes

Covariates accounted for as possible confounders in the primary analysis included demographic characteristics of age (continuous), gender (categorical), region (categorical), household income (categorical), and discretionary income (categorical). Household income was based on being either above or below the reference estimated median level for 2018, while discretionary income included having either “some but have to prioritize,” “enough to meet most personal needs,” or “enough to meet all personal needs” relative to having “very little.” Other covariates included amount spent in the last year on cosmetic treatment (continuous; calculated sum of past spending reported for each treatment a respondent reported receiving), total treatment count in the past year (continuous), future treatment type considered for the next year

(categorical; nonsurgical only or ≥ 1 surgical treatment), and type media exposure (categorical).

To identify significant predictors of treatment satisfaction for the exploratory analysis, the outcome of interest was satisfaction with past treatment. Predictor variables were the same covariates included in the primary analysis with the exclusion of future treatment type.

2.5 Statistical Analysis

2.5.1 Respondent Characteristics

Descriptive statistics were used to report respondent characteristics for the total population and for each of the 3 subgroups: nonsurgical only, surgical +/- nonsurgical, and ≥ 1 injectable treatment. Continuous variables were summarized using means and standard deviations while categorical variables were summarized using frequencies and percentages.

2.5.2 Primary Future Spend Outcome

Univariate and adjusted multivariate regression models were used to examine the association between treatment satisfaction and future spend among all respondents who received ≥ 1 treatment in the past year. The primary predictor of satisfaction was treated as a binary variable between dissatisfied and satisfied. β coefficients were reported for satisfaction, which represented the average difference in future spend in \$USD among respondents who reported being 'somewhat', 'very', or 'extremely' satisfied with past treatment relative to respondents who reported being 'completely', 'very', or 'somewhat' dissatisfied, which was represented by the β coefficient for the intercept. We adjusted for the following covariates of age, gender, region, household income, discretionary income, estimated past spent, treatment count, future treatment type, and media exposure. Stratified and subgroup analyses were conducted among the nonsurgical only, surgical +/- nonsurgical, and ≥ 1 injectable group. Respective p-values and confidence intervals were calculated from robust standard errors.

2.5.2 Sensitivity Analysis

A sensitivity analysis was conducted to validate the robustness of data from our primary sample of respondents that have only received treatment in the past year prior to survey completion. Respondent characteristics and primary future spend outcomes analyses were replicated for an expanded sample that included respondents who received ≥ 1 treatment at any time in their life (i.e., in the past year or ≥ 1 year ago). Stratified and subgroup analyses were also repeated with the same expanded population. A crude comparison was made between primary sample and expanded sample results regarding respondent characteristics and the magnitude and direction of observed effects from the primary analysis.

2.5.3 Post-hoc Power Analyses

A post-hoc analysis was conducted to determine if our analyses were sufficiently powered to detect a true association between satisfaction and planned future spending. This was conducted for the overall sample and for each of the 3 subgroups. A power of $> 80\%$ was considered sufficient to detect a moderate effect (Cohen's $f^2 = 0.015$) between satisfaction and planned future spending.

2.5.4 Exploratory Satisfaction Outcome

A logistic regression model was used to identify significant predictors of treatment satisfaction among respondents who received ≥ 1 treatment in the past year. The outcome of satisfaction was treated as a binary variable between being dissatisfied and satisfied with past treatment. Potential predictors to satisfaction included in the model were the same covariates used in the primary future spend model, with exception to future treatment type considered. Odds Ratios for being satisfied over dissatisfied with past treatment, 95% confidence intervals, and p-values were calculated for each predictor—for continuous variables— or for each category of

predictor relative to a reference for categorical variables. A likelihood ratio test was used to test the significance of predictors with ≥ 2 categories (i.e. region, household income, and discretionary income). Any variable with a p-value less than 0.05 was considered a significant predictor for treatment satisfaction. The same logistic regression was repeated for the cosmetic treatment type subgroups.

For all statistical analysis, a two-sided alpha at 5% significance level was used. R version 3.5.2 (R Foundation for Statistical Computing, Vienna, Austria) was used to conduct the analyses.

3. Results

3.1 Treatment Types & Respondent Characteristics

A total of 474 aesthetically conscious U.S. respondents received ≥ 1 professional cosmetic treatment exclusively within the year prior to survey completion. Most respondents received nonsurgical treatment(s) only (n=393, 82.9%) compared to respondents who received ≥ 1 surgical treatment (n=81, 17.1%). Respondents who received ≥ 1 wrinkle-relaxing or dermal filler injection in the past year represented less than one-third respondents (n=139, 29.3%).

The majority of respondents were Caucasian (80.0%) females (67.5%) in their mid-forties (mean age 42.8 ± 12.9 years). Those who received ≥ 1 surgical treatment deviated from this trend with most being male (67.9%) and a slightly younger in mean age (38.2 ± 11 years) compared to the overall population and other subgroups. Respondents were evenly distributed among the northeast, midwest, south, and west regions of the country. Over half of respondents (55.1%) reported an annual income within the 2018 median household income range between \$60,000 to \$150,000, with varying levels of discretionary income (Table 1.1). Most respondents relied on the internet and social media (66.2% all, 64.6% nonsurgical only, 74.1% surgical +/-

nonsurgical, 22.3% injectables) or other sources (65.2% all, 63.4% nonsurgical only, 74.1% surgical +/- nonsurgical, 23.7% injectables), such as celebrities, healthcare providers, friends, family, and beauty stylists to learn about beauty or grooming treatments (Table 1.2).

Respondents were generally satisfied with the outcome of their past treatment(s) (43.9% somewhat satisfied, 26.4% very satisfied, 16.2% extremely satisfied). Among respondents in the nonsurgical only group, the largest category of satisfaction reported was “somewhat satisfied” (48.9%), while the largest category for respondents in the surgical +/- nonsurgical group was “extremely satisfied” (38.3%).

An average planned spending of $\$1023 \pm 4885$ in the next year on professional cosmetic treatments was reported. This estimate was lower among those who only ever received nonsurgical treatment ($\$691 \pm 1462$) and significantly higher among those who received ≥ 1 surgical treatment ($\$2629 \pm 11289$)—an estimate influenced by a single respondent’s ($n=1$) future spend reported as \$100,000, while most estimates fell below \$10,000 in this same group. Those who received injectables reported that they planned to spend an average of $\$1801 \pm 2853$ in the next year on cosmetic treatment (Table 1.2).

3.2 Primary Future Spend Outcome

Overall population

Among all respondents, those satisfied with past treatment planned to spend an average of \$272 less on cosmetic treatments in the next year than those dissatisfied after adjusting for confounding variables of age, gender, income, past spend, treatment count, future treatment type, and media exposure (95% CI $-\$926.5$ to 382.7 , $p = 0.415$). A post-hoc power analysis which determined sufficient power for this sample suggests there is no significant association between satisfaction and future planned spending (Table 2.1). A summary of covariate associations with future spend is provided in Supplementary Table S4a.

Nonsurgical Only Group

Among respondents who only received nonsurgical treatment, those satisfied with past treatments planned to spend an average of \$219 less on cosmetic treatments in the next year than those dissatisfied (95% CI -\$612.4 to 173.8, $p=0.273$) (Table 2.2a). Similar to the overall sample of respondents, a post-hoc analysis indicated sufficient power. Therefore, there is no significant association observed between satisfaction and future planned spending in the nonsurgical only group. A summary of covariate associations with future spend is provided in Supplementary Table S4b.

Surgical +/- Nonsurgical Group

Among respondents who received at least 1 surgical treatment, those satisfied with past treatments planned to spend an average of \$191 more on cosmetic treatments in the next year than those dissatisfied (95% CI -\$2179 to 2561, $p=0.872$). No significant association was observed between satisfaction and planned future spending (Table 2.2a). However, a post-hoc analyses determined insufficient power (40%) to detect a moderate effect between satisfaction and planned future spending among those who received ≥ 1 surgical treatment.

Injectables Group

Within the subgroup that received at least 1 wrinkle relaxer and/or dermal filler treatment in the past year, those satisfied planned to spend an average of \$167 less in the next year than those who were dissatisfied (95% CI -2241 to 1907, $p=0.874$). The association between satisfaction and planned future spending was not significant (Table 2.2b). A post-hoc analyses determined insufficient power (74%) to detect a moderate effect between satisfaction and planned future spending among those who received ≥ 1 injectable treatment.

3.3 Sensitivity Analysis

A total of 1,777 respondents received at least 1 professional cosmetic treatment in their lifetime, with 70% in the nonsurgical, 30% in the surgical +/- nonsurgical, and 12.4% in the

injectables groups. Demographics were similar compared to the primary sample, with exception to the expanded surgical +/- nonsurgical group who better represented of the distribution between males and females of the overall population (65.5% vs. 32.1% females in expanded sample and primary analysis sample) (Supplementary Table S5.1). The distributions of satisfaction scores and future spend remained similar to the primary sample (Supplementary Table S5.2).

Among respondents who received ≥ 1 treatment in their lifetime, those who were satisfied planned to spend more than those dissatisfied. The same positive association was observed in the nonsurgical and surgical +/- nonsurgical stratified analyses, but not among the expanded injectable group. A post-hoc analysis determined sufficient power for all expanded subgroups. No significant association between satisfaction and planned future spending was detected among any group (Supplementary Tables S6.1- 6.2b).

3.4 Predictors to Satisfaction

Predictors observed to significantly influence satisfaction in the sample of respondents who received treatment exclusively in past year included annual household income, discretionary income, and treatment count in the past year, after adjusting for covariates (Table 3a). For household income, respondents specifically making below the median level had less than half the odds of being satisfied with past treatment compared to those within the median income range (OR = 0.434, 95% CI 0.232 to 0.813, $p= 0.009$). For discretionary income, respondents who reported having 'some but have to prioritize' or 'enough to meet all personal needs' had a significantly higher odds of being satisfied by 2.19 times (95% CI 1.05 to 4.57, $p= 0.036$) and 3.74 times (95% CI 1.31 to 10.7, $p= 0.014$), respectively, relative to respondents who reported 'very little' discretionary income. The likelihood ratio test confirmed general significance for the

multicategory variables of household income ($p= 0.010$) and discretionary income ($p= 0.034$). For each additional treatment received in the past year, respondents had 1.37 times higher odds of being satisfied (95% CI 1.04 to 1.81, $p= 0.026$) relative to a respondent who received one fewer cosmetic treatment (Table 3a).

Specifically, discretionary income ($p=0.028$) and treatment count ($p=0.017$) were found to be significant for the nonsurgical only group. Household income ($p=0.044$) was found to be significant only for the surgical +/- nonsurgical group (Table 3b). Only internet exposure was observed to be a significant predictor for the injectable treatments subgroup ($p=0.047$) (Table 3b).

4. Discussion

4.1 Results Summary

In this cross-sectional study, we assessed the relationship between satisfaction and planned future spending on professional cosmetic treatments among aesthetically conscious U.S. adults who exclusively received professional cosmetic treatments in the year prior to completing the Beauty360 survey. We conducted a regression approach between satisfaction as a predictor and future spend as the primary outcome to model this relationship, and further examined this association in respondents who either exclusively received nonsurgical treatments, received at least 1 surgical treatment, and those who received at least 1 wrinkle-relaxing or dermal filler injection.

Among all respondents, those who were satisfied planned to spend \$150 to \$300 less on cosmetic treatments in the next year compared to those dissatisfied, which was also observed among nonsurgical only and injectable treatment groups. Respondents who received at least 1 surgery planned to spend an average of nearly \$200 more in the next year. However, these

findings do not show an association between satisfaction and future spend in our primary sample or either of our subgroups. As an exploratory objective, we identified annual household and discretionary income levels, and total count of past treatments to be significant predictors of treatment satisfaction.

4.2 Implications

To our knowledge, this is the first study of its kind to specifically examine the association between satisfaction and planned future spending among professional cosmetic treatments. We did not observe any significant associations between satisfaction and planned future spending, which highlights the complex relationship between the two variables. This absence of an effect can potentially be attributed to several reasons, including the presence of unmeasured confounders, heterogeneity between respondents, or general uncertainty in the validity of responses. Satisfaction and spending are complex emotions and behaviors, so a variety of other factors exist—including those not captured in our model—that can affect each variable differently. The inability to control for these confounders can mask the true relationship between both variables. In our model, the magnitude of effect differed depending on treatment type, suggesting heterogeneity between respondents or a potential effect modification. However, underpowered subgroup analyses led us to conclude no effect. Future adequately powered studies could provide more clarity in addressing this relationship. In addition, given the 42 different treatments that respondents were surveyed on, the ability to provide a true planned spend estimate can become more difficult with more treatments considered. Therefore, the validity of the outcomes data in accurately representing future planned spending is highly variable. Lastly, this absence of an effect can simply be attributed to satisfaction having less of a

meaningful impact on planned future spend, and other factors like motivators to receiving treatment, self-esteem, or current beauty standards having a stronger, meaningful impact.

Although we did not find statistically significant associations, the direction and magnitude of effect were consistent across most of the groups. Patterns of lower future spend among respondents who were satisfied with past treatment, particularly with those who exclusively received nonsurgical treatment or at least 1 injectable treatment, may indicate that satisfied individuals who invested a modest amount of time and money to achieve satisfactory results did not feel the need to invest a significant additional amount of money to maintain or achieve their beauty standards. On the contrary, the higher future spending observed for satisfied respondents in the surgical group may imply systematic differences between those who have invested in at least 1 surgical treatment versus those who have only received nonsurgical treatment. Respondents who generally invested more time and money upfront on surgery may already be comfortable investing more toward future treatments to actively maintain or pursue more satisfaction. We hope this data can help inform future research to include robust samples of surgical and injectable treatment-experienced consumers. With increasing popularity and billions of dollars invested on cosmetic treatments annually, it's pertinent to understand how psychosocial outcomes from cosmetic treatments can influence spending habits.

Household income as a significant predictor to treatment satisfaction may suggest that a consumer's socioeconomic status can influence their perspective on beauty standards. The significance of discretionary income also being a significant predictor signifies that a consumer's purchasing power may also heavily influence their odds of being satisfied. Higher purchasing power implies a higher likelihood of receiving more treatment, which is shown to also impact satisfaction. Furthermore, the significance of discretionary income and past treatment count for

nonsurgical only respondents may highlight systematic differences between our nonsurgical only and our ≥ 1 surgical treatment groups. The satisfaction of those who were limited to only investing in nonsurgical treatments was dependent on how much extra spending money was available, wanting to gain more satisfaction for each additional treatment invested. These individuals may be more conscious in spending than those who were willing to invest more with surgery. While the combination of household income, discretionary income, and treatment count as significant predictors might have pointed toward a relationship between amount spent on past treatment and satisfaction, the past spent variable was not significant, highlighting the unique influences of each of these variables on satisfaction.

Our exploratory findings did not align with previous studies that identified age, gender, and media exposure as predictors to satisfaction.^{10-11,19} This can be due in part to specific limitations in the Beauty360 survey design discussed in the next section. We hope our findings can help inform aesthetic providers on characteristics that may influence treatment success, since satisfaction is a key proxy for success. Since both household and discretionary incomes are significant predictors overall, being cognizant of this can help providers proactively discuss barriers for treatment success upfront with consumers who may be more hesitant to invest in treatment.

4.3 Limitations

A major limitation to our study was the size of our primary sample, which was a result of excluding any respondents who received professional cosmetic treatment past the 1 year leading up to the study sample. Our post-hoc power analyses demonstrated that this limitation carried over to our stratified and subgroup analyses results, particularly with our primary surgical +/- nonsurgical treatment group of less than 90 individuals that disproportionately had more males

than females. In addition, by limiting our results to the past year, the satisfaction captured is only indicative of short-term results. The dynamic nature of long-term treatment effects and the evolving perspectives of beauty over time are also not fully captured in our model.

The Beauty360 survey and its questions were not specifically designed for the purpose of investigating the relationship between treatment satisfaction and spend. Because of this limitation to our analysis, there was the possibility of having unmeasured covariates in our model. An example of this is treatment expectations which can potentially affect both treatment satisfaction and future spend, thereby impacting the association between the two variables. Another example is our limited capturing of media exposure. Previous studies noted amount of media exposure to be a predictor to both satisfaction and the likelihood of undergoing treatment.^{10,19} Since the survey did not include items catered toward amount of media exposure, type of media was used as a close proxy.

Since all eligible Beauty360 respondents were “aesthetically conscious” adults who were willing to or prepared to invest in future cosmetic treatment, our results have limited generalizability to the broader U.S. population. Advertising and marketing bias may also be present in our analysis since several survey items and listed professional treatments required familiarity from prospective consumers with the treatment terminologies used. In addition, estimated future spend data may be limited by the prospective consumer’s knowledge and prior research of general treatment costs for treatments they were interested in.

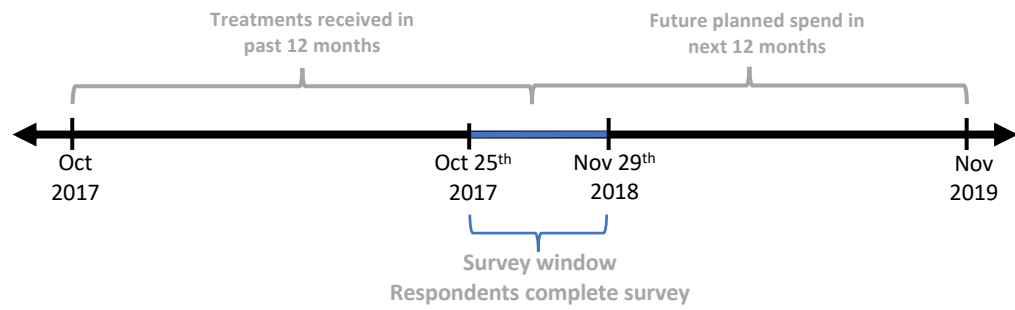
5. Conclusion

This cross-sectional study found no significant associations between professional cosmetic treatment satisfaction and future spend among aesthetically conscious U.S. respondents. Possible significant influencers of treatment satisfaction included annual and

discretionary income as well as total treatment count in the past year. Future research with more robust study samples can help further broaden the public's knowledge on what drives both satisfaction and spending for cosmetic treatments.

6. Figures

Figure 1. Study Timeline for study population



7. Tables

Table 1.1: Treatment Types & Respondent Characteristics among Respondents who received ≥ 1 treatment exclusively in the past year

Characteristic	Received ≥ 1 treatment in the past 12 months (n=474)			
	Nonsurgical only ^a (n= 393)	Surgical +/- nonsurgical ^b (n= 81)	Total (n=474)	≥ 1 Injectable [†] (n= 139)
Age (years), mean \pm SD	43.9 \pm 13.0	38.2 \pm 11.0	42.8 \pm 12.9	45.0 \pm 11.9
Sex, n (%)				
Female	294 (74.8)	26 (32.1)	320 (67.5)	96 (69.1)
Male	99 (25.2)	55 (67.9)	154 (32.5)	43 (30.9)
Race, n (%)				
Caucasian	308 (78.4)	71 (87.7)	379 (80.0)	125 (89.9)
Black	30 (7.6)	4 (4.9)	34 (7.2)	4 (2.9)
Hispanic	27 (6.9)	6 (7.4)	33 (7.0)	7 (5.0)
Asian	20 (5.1)	0 (0.0)	20 (4.2)	1 (0.7)
Other	6 (1.5)	0 (0.0)	6 (1.3)	1 (0.7)
Unknown	2 (0.5)	0 (0.0)	2 (0.4)	1 (0.7)
Region, n (%)				
Northeast	107 (27.2)	14 (17.3)	121 (25.5)	35 (25.2)
Midwest	84 (21.4)	19 (23.5)	103 (21.7)	24 (17.3)
South	112 (28.5)	28 (34.6)	140 (29.5)	51 (36.7)
West	90 (22.9)	20 (24.7)	110 (23.2)	29 (20.9)
Annual household income level (\$USD)*, n(%)				
Below median (< \$60k)	135 (34.4)	16 (19.8)	151 (31.9)	30 (21.6)
Median (\$60k- \$150k)	202 (51.4)	59 (72.8)	261 (55.1)	83 (59.7)
Above median(> \$150k)	40 (10.2)	5 (6.2)	45 (9.5)	23 (16.5)
Unknown	16 (4.1)	1 (1.2)	17 (3.6)	3 (2.2)
Discretionary income level, n(%)				
“Very little”	82 (20.9)	34 (42.0)	116 (24.5)	42 (30.2)
“Some but have to prioritize”	131 (33.3)	19 (23.5)	150 (31.6)	36 (25.9)
“Enough to meet most personal needs”	102 (26.0)	10 (12.3)	112 (23.6)	37 (26.6)
“Enough to meet all personal needs”	78 (19.8)	18 (22.2)	96 (20.3)	24 (17.3)

^a Nonsurgical only group = Respondents who exclusively received ≥ 1 nonsurgical treatment(s)

^b Surgical +/- nonsurgical group = Respondents who received ≥ 1 surgical treatment(s) (+/- nonsurgical treatment(s))

[†] Injectable treatments = non-mutually exclusive group; Any respondent receiving wrinkle relaxing injections and/or dermal fillers

* Income levels based on 2018 median income reports²³

Table 1.2. Additional respondent characteristics on satisfaction, future spend, and media exposure

Parameters	Received ≥ 1 treatment in the past 12 months (n= 474)			
	Nonsurgical only ^a (n= 393)	Surgical +/- nonsurgical ^b (n= 81)	Total (n= 474)	≥ 1 injectable [†] (n= 139)
Satisfaction scores, n(%) [Range: 1-6]				
- “Completely dissatisfied”	7 (1.8)	2 (2.5)	9 (1.9)	3 (2.2)
- “Very dissatisfied”	6 (1.5)	2 (2.5)	8 (1.7)	2 (1.4)
- “Somewhat dissatisfied”	43 (10.9)	4 (4.9)	47 (9.9)	7 (5.0)
- “Somewhat satisfied”	192 (48.9)	16 (19.8)	208 (43.9)	35 (25.2)
- “Very satisfied”	99 (25.2)	26 (32.1)	125 (26.4)	55 (39.6)
- “Extremely satisfied”	46 (11.7)	31 (38.3)	77 (16.2)	37 (26.6)
Total Estimated future spend in the next 12months (\$USD), mean \pm SD	691.4 \pm 1462	2629 \pm 11289	1023 \pm 4885	1801 \pm 2853
Media Exposure, n(%)*				
Print media	164 (41.7)	45 (55.6)	209 (44.1)	18 (12.9)
Broadcast/mass media	134 (34.1)	52 (64.2)	186 (39.2)	23 (16.5)
Internet (social) media	254 (64.6)	60 (74.1)	314 (66.2)	31 (22.3)
Other media	249 (63.4)	60 (74.1)	309 (65.2)	33 (23.7)
None	23 (5.9)	2 (2.5)	25 (5.3)	0 (0.0)
^a Nonsurgical only group = Respondents who exclusively received ≥ 1 nonsurgical treatment(s) ^b Surgical +/- nonsurgical group = Respondents who received ≥ 1 surgical treatment(s) (+/- nonsurgical treatment(s)) [†] Injectable treatments = non-mutually exclusive group; Any respondent receiving wrinkle relaxing injections and/or dermal fillers * Reported media exposure type variable is non-mutually exclusive—respondents from each group can be exposed to ≥ 1 media type				

Table 2.1. Results from the linear regression for future estimated spend (outcome) and treatment satisfaction (independent variable) among all respondents planning to spend on cosmetic treatments the next 12 months.

	All respondents who received ≥ 1 treatment in the past year (n= 474)					
	Unadjusted model [†]			Adjusted Model ^{††}		
Satisfaction Level	β^*	95% CI	p-value	β^*	95% CI	p-value
Dissatisfied (Intercept)	929.1	578.4 to 1280	<0.001	-442.6	-1634 to 748.4	0.466
Satisfied	108.0	-508.7 to 724.7	0.731	-271.9	-926.5 to 382.7	0.415

Table 2.2a Results from the stratified linear regression for future estimated spend (outcome) and treatment satisfaction (independent variable) by treatment type

	Nonsurgical Only (n=393)						Surgical +/- nonsurgical (n= 81)					
	Unadjusted model [†]			Adjusted Model ^{††}			Unadjusted model [†]			Adjusted Model ^{††}		
Satisfaction Level	β^*	95% CI	p-value	β^*	95% CI	p-value	β^*	95% CI	p-value	β^*	95% CI	p-value
Dissatisfied (Intercept)	977.1	582.5 to 1372	<0.001	-156.9	-730.9 to 417.0	0.591	593.7	140.1 to 1047	0.011	-5842	-15957 to 4273	0.252
Satisfied	-333.1	-757.2 to 90.95	0.123	-219.3	-612.4 to 173.8	0.273	2259	-560.5 to 5078	0.115	190.9	-2179 to 2561	0.872

Table 3.2b Results from the stratified linear regression for future estimated spend (outcome) and treatment satisfaction (independent variable) for injectable treatments

	≥ 1 Injectable treatment (n= 139)					
	Unadjusted model [†]			Adjusted Model ^{††}		
Satisfaction Level	β^*	95% CI	p-value	β^*	95% CI	p-value
Dissatisfied (Intercept)	2067	249.7 to 3884	0.026	727.7	-4094 to 5550	0.765
Satisfied	-290.7	-2174 to 1593	0.761	-166.7	-2241 to 1907	0.874

Table 2.1 to 2.2a/b footnotes:

* β coefficients:

- Dissatisfied: Average future spend among respondents who report being ‘completely dissatisfied’, ‘very dissatisfied’, or ‘somewhat dissatisfied’ with past treatments
- Satisfied: Average difference in future spend among respondents who report being ‘somewhat satisfied’, ‘very satisfied’ or ‘extremely satisfied’ relative to respondents who are dissatisfied with past treatments.

[†] Unadjusted: Univariate model

^{††} Adjusted: Multivariate model; Adjusted for age, gender, income, estimated past spent, treatment count, future treatment type, media exposure

Table 3a Results from the logistic regression indicating the odds of being satisfied relative to being dissatisfied with treatment for each variable among all respondents who received treatment exclusively in the past year.

Predictors of Satisfaction	Any treatment(s) received in past 12 mo. (n= 474)		
	<i>Odds Ratio [OR]*</i>	95% CI	p-value
Age (each year of age)	0.986	0.963 to 1.009	0.229
Gender: Male (Reference: Female)	1.277	0.637 to 2.558	0.491
Region (Reference: Northeast)			0.149
- Midwest	0.616	0.302 to 1.407	0.276
- South	1.629	0.719 to 3.688	0.242
- West	1.129	0.491 to 2.608	0.776
Annual household income (\$) (Reference: \$60k - \$150k (median))			0.010[†]
- < \$60k (below median)	0.434	0.232 to 0.8120	0.009
- > \$150k (above median)	0.670	0.233 to 2.093	0.523
Discretionary income level (Reference: "Very little")			0.034[†]
- "Some but have to prioritize"	2.192	1.051 to 4.572	0.036
- "Enough to meet most personal needs"	1.516	0.685 to 3.359	0.304
- "Enough to meet all personal needs"	3.738	1.305 to 10.701	0.014
Estimated past spent (\$)	1.000	0.999 to 1.000	0.404
Treatment count in past 12 mo.	1.372	1.039 to 1.812	0.026
Past treatment type : ≥ 1 Surgical (Reference: Nonsurgical only)	0.658	0.287 to 1.820	0.422
Media: print	0.860	0.470 to 1.572	0.623
Media: broadcast	0.921	0.489 to 1.731	0.797
Media: internet	0.705	0.344 to 1.444	0.339
Media: other	1.233	0.654 to 2.323	0.516
Media: none	0.703	0.175 to 2.826	0.620

* OR = Odds Ratio; Represents the odds of being somewhat/very/extremely satisfied versus somewhat/very/extremely dissatisfied for each of the predictors
[†] p-value represents significant relationship between overall variable with >2 categories and satisfaction using the likelihood ratio test.
Bold: p-value represents significant relationship between variable and satisfaction.

Table 3b Results from the logistic regression indicating the odds of being satisfied relative to being dissatisfied with treatment for each variable among all different treatment groups

Predictors of Satisfaction	Treatment Groups*								
	Nonsurgical only (n= 393)			Surgical +/- nonsurgical (n= 81)			Injectable treatments (n= 139)		
	OR*	95% CI	p-value	OR*	95% CI	p-value	OR*	95% CI	p-value
Age (each year of age)	0.987	0.964 to 1.011	0.290	0.997	0.989 to 1.004	0.396	0.998	0.994 to 1.003	0.502
Gender: Male (Reference: Female)	1.103	0.520 to 2.340	0.799	1.014	0.845 to 1.217	0.882	0.908	0.790 to 1.043	0.173
Region (Reference: Northeast)			0.064			0.877			0.287
- Midwest	0.616	0.279 to 1.359	0.230	1.077	0.858 to 1.351	0.526	1.016	0.868 to 1.189	0.845
- South	1.992	0.824 to 4.814	0.126	0.998	0.809 to 1.231	0.988	0.901	0.796 to 1.022	0.108
- West	1.133	0.469 to 2.742	0.781	1.041	0.840 to 1.291	0.714	0.969	0.838 to 1.121	0.675
Annual household income (\$) (Reference: \$60k - \$150k (median))			0.061			0.044[†]			0.219
- < \$60k (below median)	0.512	0.259 to 1.011	0.054	0.782	0.648 to 0.943	0.012	0.884	0.778 to 1.006	0.063
- > \$150k (above median)	0.633	0.196 to 2.042	0.444	1.092	0.810 to 1.471	0.566	0.947	0.821 to 1.094	0.463
Discretionary income level (Reference: "Very little")			0.028[†]			0.123			0.906
- "Some but have to prioritize"	2.578	1.172 to 5.672	0.107	1.133	0.935 to 1.089	0.207	0.999	0.867 to 1.152	0.991
- "Enough to meet most personal needs"	2.028	0.857 to 4.799	0.009	0.864	0.685 to 1.311	0.220	0.992	0.857 to 1.148	0.918
- "Enough to meet all personal needs"	4.418	1.436 to 13.595	0.987	1.098	0.921 to 1.311	0.301	1.049	0.893 to 1.233	0.559
Estimated past spent (\$)	1.000	0.999 to 1.000	0.351	1.000	0.999 to 1.000	0.501	1.000	0.999 to 1.000	0.900
Treatment count in past 12 mo.	1.665	1.089 to 2.544	0.018	1.011	0.989 to 1.036	0.357	1.013	0.998 to 1.028	0.103
Media: print	0.652	0.341 to 1.245	0.950	1.111	0.956 to 1.292	0.174	0.980	0.882 to 1.089	0.710
Media: broadcast	1.032	0.524 to 2.032	0.928	1.030	0.887 to 1.195	0.701	1.074	0.941 to 1.224	0.292
Media: internet	0.555	0.259 to 1.188	0.129	0.877	0.727 to 1.059	0.179	0.885	0.787 to 0.996	0.047
Media: other	1.086	0.554 to 2.127	0.810	1.042	0.872 to 1.247	0.651	0.952	0.839 to 1.081	0.454
Media: none	0.568	0.136 to 2.378	0.439	0.915	0.526 to 1.591	0.753	0.972	0.740 to 1.277	0.840

* OR = Odds Ratio; Represents the odds of being somewhat/very/extremely satisfied versus somewhat/very/extremely dissatisfied for each of the predictors
[†] p-value represents significant relationship between overall variable with >2 categories and satisfaction using the likelihood ratio test.
Bold: p-value represents significant relationship between variable and satisfaction.

8. Supplementary Appendix

Table S1. A summary of the variables of interest within the Beauty360 survey and corresponding dataset variable names. Also listed are survey questions and possible responses.

Variables of Interest	Survey Item #	Corresponding data variable(s)	Survey Question	Possible responses																		
Country	--	COUNTRY10	In which country do you live?	US, Canada, Mexico, Brazil, UK, Spain, France, Germany, Italy Turkey, Russia, Saudi Arabia, India, China, Japan, South Korea, Taiwan, Australia																		
Age	S2	resp_age	What is your current age?	[Enter value]: 0-99																		
Gender	S3	QS3	What gender do you most identify with?	1= Male 2= Female 3= prefer not to answer																		
Discretionary income	S4	QS4	Which of the following statements best describes your discretionary income-- the money that you are able to use as you want that is not needed for your basic monthly expenses?	1= I have very little discretionary income 2= I have some discretionary income, but I really have to prioritize how I use it 3= I have enough discretionary income to meet most of my personal needs 4= I have enough discretionary income to meet all of my personal needs																		
Geographic region	S1	QMktSize_30_1	To begin, in which state is your primary residence located?	[Dropdown list with U.S. states]: 1= Northeast (ME, NH, VT, MA, RI, CT, NY, NJ, PA) 2= Midwest (WI, IL, MI, IN, OH, ND, SD, NE, KS, MN, IA, MO) 3= South (FL, GA, SC, NC, VA, WV, DC, MD, DE, KY, TN, MS, AL, TX, OK, AR, LA) 4= West (MT, ID, WY, NV, UT, CO, AZ, NM, WA, OR, CA, AK, HI)																		
Annual household income	D5	QD5	Please indicate your annual household income before taxes.	[Dropdown list]: <table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">_1 < \$30,000</td> <td style="width: 33%;">_7 \$80,000-\$89,999</td> <td style="width: 33%;">_13 \$250,000-\$399,000</td> </tr> <tr> <td>_2 \$30,000-\$39,999</td> <td>_8 \$90,000-\$99,999</td> <td>_14 \$400,000-\$599,000</td> </tr> <tr> <td>_3 \$40,000-\$49,999</td> <td>_9 \$100,000-\$124,999</td> <td>_15 \$600,000-\$999,000</td> </tr> <tr> <td>_4 \$50,000-\$59,999</td> <td>_10 \$125,000-\$149,999</td> <td>_16 \$1,000,000 or more</td> </tr> <tr> <td>_5 \$60,000-\$69,999</td> <td>_11 \$150,000-\$199,999</td> <td>_99 Prefer not to answer</td> </tr> <tr> <td>_6 \$70,000-\$79,999</td> <td>_12 \$200,000-\$249,999</td> <td></td> </tr> </table>	_1 < \$30,000	_7 \$80,000-\$89,999	_13 \$250,000-\$399,000	_2 \$30,000-\$39,999	_8 \$90,000-\$99,999	_14 \$400,000-\$599,000	_3 \$40,000-\$49,999	_9 \$100,000-\$124,999	_15 \$600,000-\$999,000	_4 \$50,000-\$59,999	_10 \$125,000-\$149,999	_16 \$1,000,000 or more	_5 \$60,000-\$69,999	_11 \$150,000-\$199,999	_99 Prefer not to answer	_6 \$70,000-\$79,999	_12 \$200,000-\$249,999	
_1 < \$30,000	_7 \$80,000-\$89,999	_13 \$250,000-\$399,000																				
_2 \$30,000-\$39,999	_8 \$90,000-\$99,999	_14 \$400,000-\$599,000																				
_3 \$40,000-\$49,999	_9 \$100,000-\$124,999	_15 \$600,000-\$999,000																				
_4 \$50,000-\$59,999	_10 \$125,000-\$149,999	_16 \$1,000,000 or more																				
_5 \$60,000-\$69,999	_11 \$150,000-\$199,999	_99 Prefer not to answer																				
_6 \$70,000-\$79,999	_12 \$200,000-\$249,999																					
Media exposure	Q500	[Range] Q50001 : Q50018	What information sources do you typically use to learn about [IF FEMALE: "beauty"; IF MALE "grooming"] treatments? 1. TV shows 2. TV advertisements 3. Magazine articles 4. Magazine advertisements 5. Digital advertisements	[Select for each item]: 0= No 1= Yes																		

			6. Celebrities 7. Physician/nurse/aesthetician 8. Friends/family/co-worker 9. Movies 10. Internet search 11. Radio 12. Hair stylist/make-up artist/ Barber 13. Blogs 14. Spotlyte website 15. RealSelf website 16. social media 17. Other 18. None	
Treatments received in the past	Q315	[Range] GRID_Q315_1_scale1: GRID_Q315_45_scale1	Which of the following treatments/procedures have you tried? Please select all that apply.*	1= Tried in the past year 2= Tried over 1 year ago 3= Never tried
Timing of treatments				
Treatments considering for the future	Q315	[Range] GRID_Q315_1_scale2: GRID_Q315_45_scale2	Which [of the following treatments/procedures] are you considering within the next year? Please select all that apply. *	1= Would consider in the next year 2= Would consider sometime beyond the next year 3= Would never consider
Estimated past spent on each treatment	Q320	[Range] LOOP_Q320_1_Q320_1: LOOP_Q320_45_Q320_1	What is your best guess on how much you have spent on each of the following aesthetic treatments or products in the past 12 months?*	Input \$ [RANGE 0-99,999]
Estimated future spend on each treatment	Q325	Q325	For physician-administered treatments you are considering, how much would you estimate spending on those treatments, in the next 12 months?*	\$ _____ [PROG: ALLOW NUMERIC VALUE]
Satisfaction with treatment outcome	Q570	GRID_Q5701_Q570	Overall, how satisfied are you with the following? - The outcome of your cosmetic/aesthetic treatments	6= Extremely satisfied 5= Very satisfied 4= Somewhat satisfied 3= Somewhat dissatisfied 2= Very dissatisfied 1= Completely dissatisfied
* = Table S2 provides list of professional cosmetic treatments categorized as either 'nonsurgical' or 'surgical' treatments † = Table S3 provides categorization of media exposure responses				

Table S2. Categorization of nonsurgical and surgical treatments

<i>Categorization of cosmetic treatments</i>	
Non-surgical treatments	Surgical treatments
1. Professional-grade topical skincare	23. Breast lift with implants
2. Dermaplane	24. Breast lift without implants
3. Microdermabrasion	25. Breast enlargement with implants
4. Photorejuvenation	26. Breast reduction
5. Facials	27. Fat grafting
6. Physician-strength chemical peels	28. Surgical fat reduction of body
7. Laser skin resurfacing	29. Buttock implant
8. In-office microneedling	30. Tummy tuck
9. Wrinkle-relaxing injections*	31. Eyelid lift (blepharoplasty)
10. Dermal filler injections*	32. Nose job (rhinoplasty)
11. Eyelash growth treatment	33. Chin implant
12. Laser hair removal	34. Double eyelid surgery
13. Lymphatic drainage/massage	35. Hair replacement/transplant
14. Microblading or microfeathering	36. Facelift
15. Professional teeth whitening	37. Surgical fat reduction of face/neck
16. Non-surgical body contouring/ fat reduction treatment	38. Surgical vagina rejuvenation
17. Non-surgical skin tightening	39. Penile enlargement
18. Non-surgical fat reduction under chin	40. Other surgical cosmetic procedures
19. Non-surgical vagina rejuvenation	41. Cosmetic implants
20. Tattoo removal	
21. Hyperhidrosis treatment	
22. Non-topical cellulite reduction	
* Wrinkle-relaxing and dermal filler injections are used in a subset analysis of injectable treatments	

Table S3. Categorization of media exposure covariates

Categorization of media exposure covariate	
Category	Responses [Q500]
Print	Magazine articles Magazine advertisements
Broadcast	TV shows TV advertisements Movies Radio
Internet	Digital advertisements Internet search Blogs Spotlyte website RealSelf website social media
Other	Celebrities Physician/nurse/aesthetician Friends/family/co-worker Hair stylist/make-up artist/ Barber Other
None	None

Table S4a. Results from the multivariate robust categorical regression including factors (covariates) associated with future estimated spending outcome among all respondents.

Covariates to estimated future spending	Any treatment(s) received in past 12 mo. (n= 474)		
	β	95% CI	p-value
Satisfaction	-271.9	-926.5 to 382.7	0.415
Age (each year of age)	-10.7	-37.13 to 15.71	0.426
Gender: Male (Reference: Female)	-443.7	-1147 to 259.4	0.216
Region (Reference: Northeast)			0.616
- Midwest	-464.3	-1267 to 338.2	0.256
- South	286.5	-576.6 to 1150	0.514
- West	-77.10	-636.0 to 481.8	0.786
Annual household income (\$) (Reference: \$60k - \$150k (median))			0.603
- < \$60k (below median)	-2.801	-492.4 to 486.8	0.991
- > \$150k (above median)	927.8	-961.8 to 2818	0.335
Discretionary income level (Reference: "Very little")			0.316
- "Some but have to prioritize"	674.2	-739.3 to 2088	0.349
- "Enough to meet most personal needs"	614.4	-246.6 to 1475	0.162
- "Enough to meet all personal needs"	812.7	-240.1 to 1865	0.130
Estimated past spent (\$)	0.955	-0.213 to 2.123	0.109
Treatment count in past 12 mo.	73.16	-204.7 to 351.0	0.605
Future treatment type : ≥ 1 Surgical (Reference: Nonsurgical only)	1003	499.8 to 1507	0.001
Media: print	-112.2	-788.8 to 564.4	0.745
Media: broadcast	-472.0	-1031 to 86.65	0.098
Media: internet	85.62	-363.3 to 534.8	0.708
Media: other	-565.9	-1162 to 29.91	0.063
Media: none	3004	-1380 to 7388	0.179

Table S4b. Results from the multivariate robust categorical regression including factors (covariates) associated with future estimated spending outcome by treatment group

Covariates to estimated future spending	Treatment Groups								
	Nonsurgical only (n= 393)			Surgical +/- nonsurgical (n= 81)			Injectable treatments (n= 139)		
	β	95% CI	p-value	β	95% CI	p-value	β	95% CI	p-value
Satisfaction	-219.3	-612.4 to 173.8	0.273	190.9	-2179 to 2561	0.872	-166.7	-2241 to 1907	0.874
Age (each year of age)	5.587	-3.496 to 14.67	0.227	96.52	-54.99 to 248.0	0.207	18.78	-25.68 to 45.76	0.756
Gender: Male (Reference: Female)	83.88	-209.5 to 377.2	0.574	931.7	-2239 to 41013	0.558	478.6	-789.5 to 1635	0.491
Region (Reference: Northeast)			0.048			0.262			0.577
- Midwest	-89.51	-527.3 to 348.3	0.688	-5385	-10995 to 224.3	0.060	-376.1	-2085 to 800.2	0.380
- South	-95.19	-532.7 to 342.4	0.669	596.2	-2085 to 3278	0.658	-166.4	-1776 to 1091	0.637
- West	-248.9	-629.8 to 132.0	0.200	221.4	-2576 to 3017	0.875	-876.5	-3000 to 700.1	0.221
Annual household income (\$) (Reference: \$60k - \$150k (median))			0.059			0.165			0.524
- < \$60k (below median)	-33.61	-433.9 to 366.7	0.869	-925.8	-3892 to 2041	0.535	217.5	-1182 to 1617	0.759
- > \$150k (above median)	-365.7	-656.5 to -74.81	0.014	9926	-2327 to 22179	0.110	-1020	-2499 to 458.1	0.174
Discretionary income level (Reference: "Very little")			0.877			0.527			0.231
- "Some but have to prioritize"	-99.53	-611.4 to 412.4	0.702	2729	-1011 to 6468	0.149	881.5	-1772 to 3535	0.512
- "Enough to meet most personal needs"	12.55	-439.6 to 464.7	0.956	213.4	-4365 to 4792	0.926	-109.2	-1497 to 1278	0.876
- "Enough to meet all personal needs"	18.78	-428.0 to 465.5	0.934	-366.3	-3408 to 2676	0.810	-723.5	-2201 to 753.7	0.334
Estimated past spent (\$)	0.8455	0.4237 to 1.267	0.001	0.6995	0.221 to 1.178	0.005	0.4217	0.1158 to 0.7275	0.007
Treatment count in past 12 mo.	-14.99	-243 to 213.0	0.897	296.3	-172.4 to 764.9	0.211	-193.3	-421.4 to 34.83	0.096
Future treatment type : ≥ 1 Surgical (Reference: Nonsurgical)	769.0	426.6 to 1111	<0.001	-1101	-4618 to 2415	0.533	1254	106.1 to 2401	0.033
Media: print	254.9	-46.34 to 556.2	0.097	-1962	-4745 to 820.0	0.163	-172.0	-1035 to 691.4	0.694
Media: broadcast	-264.8	-564.9 to 35.34	0.084	-728.4	-3233 to 1776	0.562	-377.5	-1831 to 1076	0.608
Media: internet	180.7	-50.35 to 411.8	0.125	2999	-687.3 to 6685	0.109	328.8	-751.1 to 1409	0.548
Media: other	-199.8	-546.2 to 146.6	0.258	-985.2	-3708 to 1737	0.471	-503.0	-2150 to 1144	0.547
Media: none	-31.45	-566.9 to 504.0	0.908	40515	1013 to 80016	0.045	533.7	-1499 to 2567	0.604

Table S5.1: Baseline Demographics & Treatment Characteristics for Sensitivity Analysis:
All respondents who received ≥ 1 treatment in lifetime

Characteristic	Received ≥ 1 treatment at any time in lifetime (n= 1,777)			
	Nonsurgical only ^a (n= 1,243)	Surgical +/- nonsurgical ^b (n=534)	Total (n=1,777)	≥ 1 Injectable [†] (n = 221)
Age (years), mean \pm SD	46.4 \pm 12.9	43.6 \pm 12.6	45.5 \pm 12.9	46.7 \pm 12.2
Sex, n (%)				
Female	1,007 (81.0)	350 (65.5)	1357 (76.4)	167 (75.6)
Male	236 (19.0)	184 (34.5)	420 (23.6)	54 (24.4)
Race, n (%)				
Caucasian	1,013 (81.5)	440 (82.4)	1453 (81.8)	201 (91.0)
Black	67 (5.4)	27 (5.1)	94 (5.3)	4 (1.8)
Hispanic	68 (5.5)	32 (6.0)	100 (5.6)	10 (4.5)
Asian	65 (5.2)	21 (3.9)	86 (4.8)	3 (1.4)
Other	19 (1.5)	10 (1.9)	29 (1.6)	1 (0.5)
Unknown	11 (0.9)	4 (0.7)	15 (0.8)	2 (0.9)
Region, n (%)				
Northeast	265 (21.3)	115 (21.5)	380 (21.4)	45 (20.4)
Midwest	282 (22.7)	91 (17.0)	373 (21.0)	40 (18.1)
South	405 (32.6)	194 (36.3)	599 (33.7)	83 (37.6)
West	291 (23.4)	134 (25.1)	425 (23.9)	53 (24.0)
Annual household income level (\$USD)*, n(%)				
Below median (< \$60k)	431 (34.7)	153 (28.7)	584 (32.9)	49 (22.2)
Median (\$60k- \$150k)	631 (50.8)	292 (54.7)	923 (51.9)	133 (60.2)
Above median(> \$150k)	124 (10.0)	68 (12.7)	192 (10.8)	32 (14.5)
Unknown	57 (4.6)	21 (3.9)	78 (4.4)	7 (3.2)
Discretionary income level, n(%)				
"Very little"	297 (23.9)	174 (32.6)	471 (26.5)	61 (27.6)
"Some but have to prioritize"	456 (36.7)	166 (31.1)	622 (35.0)	63 (28.5)
"Enough to meet most personal needs"	307 (24.7)	111 (20.8)	418 (23.5)	58 (26.2)
"Enough to meet all personal needs"	183 (14.7)	83 (15.5)	266 (15.0)	39 (17.6)

^a Nonsurgical only group = Respondents who exclusively received >1 nonsurgical treatment(s) in the past 12 months (+/- exclusively nonsurgical treatments anytime).
^b Surgical +/- nonsurgical group = Respondents who received >1 surgical treatment(s) in the past 12 months (+/- any other treatments at any time)
[†] Injectable treatments = non-mutually exclusive group; Any respondent receiving wrinkle relaxing injections and/or dermal fillers
* Income levels based on 2018 median income reports²³

Table S5.2: Additional respondent characteristics on satisfaction, future spend, and media exposure for Sensitivity Analysis: All respondents who received ≥ 1 treatment in lifetime

Parameters	Received ≥ 1 treatment at any time in lifetime (n=1, 777)			
	Nonsurgical only ^a (n= 1,243)	Surgical +/- nonsurgical ^b (n= 534)	Total (n=1,777)	≥ 1 injectable [†] (n= 221)
Satisfaction scores, n(%) [Range: 1-6]				
- "Completely dissatisfied"	34 (2.7)	13 (2.4)	47 (2.6)	5 (2.3)
- "Very dissatisfied"	25 (2.0)	11 (2.1)	36 (2.0)	5 (2.3)
- "Somewhat dissatisfied"	166 (13.4)	54 (10.1)	220 (12.4)	19 (8.6)
- "Somewhat satisfied"	644 (51.8)	165 (30.9)	809 (45.5)	61 (27.6)
- "Very satisfied"	282 (22.7)	176 (33.0)	458 (25.8)	78 (35.3)
- "Extremely satisfied"	92 (7.4)	115 (21.5)	207 (11.6)	53 (24.0)
Total Estimated future spend in the next 12months (\$USD), mean \pm SD	1064 \pm 6121	1653 \pm 5547	1241 \pm 5959	1789 \pm 2856
Media Exposure, n(%)*				
Print media	501 (40.3)	222 (41.6)	723 (40.7)	103 (46.6)
Broadcast/mass media	422 (34.0)	243 (45.5)	665 (37.4)	91 (41.2)
Internet (social) media	769 (61.9)	358 (67.0)	1127 (63.4)	156 (70.6)
Other media	823 (66.2)	387 (72.5)	1210 (68.1)	169 (76.5)
None	81 (6.5)	16 (3.0)	97 (5.5)	8 (3.6)
^a Nonsurgical only group = Respondents who exclusively received >1 nonsurgical treatment(s) in the past 12 months (+/- exclusively nonsurgical treatments at any time). ^b Surgical +/- nonsurgical group = Respondents who received >1 surgical treatment(s) in the past 12 months (+/- any other treatments at any time) [†] Injectable treatments = non-mutually exclusive group; Any respondent receiving wrinkle relaxing injections and/or dermal fillers * Reported media exposure type variable is non-mutually exclusive—respondents from each group can be exposed to ≥ 1 media type				

Table S6.1 Results from the linear regression for future estimated spend (outcome) and treatment satisfaction (independent variable) among all respondents who received treatment at anytime

	All respondents who received ≥ 1 treatment in lifetime (n= 1,777)					
	Unadjusted model [†]			Adjusted Model ^{††}		
Satisfaction Level	β^*	95% CI	p-value	β^*	95% CI	p-value
Dissatisfied (Intercept)	1058	827.4 to 1289	<0.001	1049	-211.4 to 2309	0.103
Satisfied	220.7	-182.8 to 624.1	0.284	378.5	-80.36 to 837.3	0.106

Table S6.2a Results from the stratified linear regression for future estimated spend (outcome) and treatment satisfaction (independent variable) by treatment type among all respondents who received treatment at anytime

	Nonsurgical Only (n=1,243)						Surgical +/- nonsurgical (n=)					
	Unadjusted model [†]			Adjusted Model ^{††}			Unadjusted model [†]			Adjusted Model ^{††}		
Satisfaction Level	β^*	95% CI	p-value	β^*	95% CI	p-value	β^*	95% CI	p-value	β^*	95% CI	p-value
Dissatisfied (Intercept)	1011	739.6 to 1282	<0.001	869.2	-604.7 to 2343	0.248	1194	757.0 to 1632	<0.001	-212.6	-2759 to 2334	0.870
Satisfied	65.17	-427.9 to 558.3	0.795	394.1	-257.8 to 1046	0.236	537.1	-163.6 to 1238	0.133	550.6	-342.7 to 1444	0.227

Table S6.2b Results from the stratified linear regression for future estimated spend (outcome) and treatment satisfaction (independent variable) for injectable treatments among all respondents who received treatment at anytime

	≥ 1 Injectable treatment (n= 221)					
	Unadjusted model [†]			Adjusted Model ^{††}		
Satisfaction Level	β^*	95% CI	p-value	β^*	95% CI	p-value
Dissatisfied (Intercept)	2087	1018 to 3156	<0.001	2665	-119.8 to 5449	0.061
Satisfied	-473.2	-1613 to 666.6	0.414	-666.8	-1939 to 605.5	0.303

Table S6.1 to S6.2a/b footnotes:

* β coefficients:

- Dissatisfied: Average future spend among respondents who report being ‘completely dissatisfied’, ‘very dissatisfied’, or ‘somewhat dissatisfied’ with past treatments
- Satisfied: Average difference in future spend among respondents who report being ‘somewhat satisfied’, ‘very satisfied’ or ‘extremely satisfied’ relative to respondents who are dissatisfied with past treatments.

† Unadjusted: Univariate model

†† Adjusted: Multivariate model; Adjusted for age, gender, income, estimated past spent, treatment count, future treatment type

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