Cosmetic Surgery Procedures as Luxury Goods
Measuring Price and Demand in Facial Plastic Surgery
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Objectives: To evaluate the relationship between cosmetic facial plastic surgery procedure price and demand, and to test the hypothesis that these procedures function as luxury goods in the marketplace, with an upward-sloping demand curve.

Methods: Data were derived from a survey that was sent to every (N=1727) active fellow, member, or associate of the American Academy of Facial Plastic and Reconstructive Surgery, assessing the costs and frequency of 4 common cosmetic facial plastic surgery procedures (facelift, brow-lift, blepharoplasty, and rhinoplasty) for 1999 and 1989. An economic analysis was performed to assess the relationship of price and demand for these procedures.

Results: A significant association was found between increasing surgeons' fees and total charges for cosmetic facial plastic surgery procedures and increasing demand for these procedures, as measured by their annual frequency (P=.003). After a multiple regression analysis correcting for confounding variables, this association of increased price with increased demand holds for each of the 4 procedures studied, across all US regions, and for both periods surveyed.

Conclusions: Cosmetic facial plastic surgery procedures do appear to function as luxury goods in the marketplace, with an upward-sloping demand curve. This stands in contrast to other, traditional, goods for which demand typically declines as price increases. It appears that economic methods can be used to evaluate cosmetic procedure trends; however, these methods must be founded on the appropriate economic theory.

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Here has been recent interest in the use of economic methods to analyze the pricing, supply, and demand of cosmetic plastic surgery procedures in the free marketplace. Krieger and Shaw have argued that aesthetic procedures, unlike other areas of health care, can be analyzed by traditional economic methods and should react in traditional ways to market forces, given the unique nature of cosmetics compared with other insurance-based procedures. The fact that most cosmetic procedures are out-of-pocket expenses for the patient without third-party involvement does imply that these procedures may be able to be studied without the limitations that constrain other realms of health care economic analysis.

The use of economic methods in this manner focuses on the measurement and evaluation of the price, supply, and demand of cosmetic procedures and the relationship of these important factors. The application of these methods, however, does not dictate that individuals seeking cosmetic plastic surgery procedures will act to maximize their utility by following the laws of classic economics. For instance, critical variants in demand behavior have long been ascribed to certain types of goods and services in neoclassic economic thought. Although the consumption of most goods and services does take the form of a downward-sloping demand curve in the free marketplace, with an increase in price leading to a decrease in demand, economists have long known that not all goods elicit this classic behavior. The great economist Alfred Marshall refers to this variant when he writes, in his landmark Principles of Economics, “There are many classes of things the need for which on the part of any individual is inconstant, fitful, and irregular. There can be no list of individual demand prices for...the services of an expert surgeon.”

Although Marshall concentrates on traditionally sloped supply-and-demand curves, he is careful to point out that not
utility by electing to pay more to support their belief that consumers of certain luxury goods in fact maximize their ability at a lower price to maximize monetary utility, many substituting the next best good or service that is avail-

expensive goods or services are better than the less ex-

crease, with increased price leading to increased de-

contrast to this expected behavior.

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in classic economic behavior, an increase in demand for one reason or another leads to a decrease in supply and, consequently, an increase in price. The forces of supply and demand reach an equilibrium price point because such an increase in price classically leads to a subsequent decrease in demand. Consumer behavior toward the Giffen goods thus stands in sharp con-

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For demographic characteristics, this study population was relatively homogeneous, with most respondents being approximately 46 years old, male (93.9%), and almost 15 years in practice. Most respondents (81.1%) work in the private practice setting, and although there was a wide range in the cosmetic nature of each practice, the average respondent’s practice was approximately 40% cosmetic. Most of those surveyed (69.3%) used some form of marketing; however, this represented only a small fraction (5.1%) of most respondents’ annual overhead.

The geographic and temporal trends in procedure cost and frequency have been previously published.3 These previously published data show that from 1989 to 1999 there has been an increase in aging face procedure frequency and cost, while rhinoplasty frequency has actu-

years in practice, and the percentage of overhead spent on marketing. The strongest correlates with cosmetic pro-

RESULTS

All goods are consumed in this fashion. These nontradi-

tional goods, commonly referred to as Giffen goods, fol-

low the pattern of an upward-sloping demand curve. For these items, an increase in price actually leads to an in-

crease in demand. Marshall writes: “For instance, as Sir R. Giffen has pointed out, a rise in . . . price . . . [may lead to] . . . consuming more, and not less. . . . But such cases are rare; when they are met with, each must be treated on its own merits.”4(p12)

As Marshall describes, this demand phenomenon is rare and interesting because it is the increase in price that creates the increase in demand and not, as typically ex-

pected, the converse. In classic economic behavior, an increase in demand for one reason or another leads to a decrease in supply and, consequently, an increase in price. The forces of supply and demand reach an equilibrium price point because such an increase in price classically leads to a subsequent decrease in demand. Consumer behavior toward the Giffen goods thus stands in sharp contrast to this expected behavior.

In addition to Giffen goods, some luxury goods also elicit this nontraditional behavior in the free market-

place, resulting in a similarly upward-sloping demand curve, with increased price leading to increased de-

mand. Unlike Giffen goods, this unusual demand behav-

ior is secondary to the consumer’s perception that more expensive goods or services are better than the less ex-

pensive alternatives. As the price increases, rather than substituting the next best good or service that is available at a lower price to maximize monetary utility, many consumers of certain luxury goods in fact maximize their utility by electing to pay more to support their belief that they have purchased the best. This perception may be based on actual benefits, such as better surgical results or technical skills, or simply on the perceived status and prestige that is associated with that good or service. The reasoning, however, is inconsequential in the aggregate, as it is the consumer’s highly individual perception associated with the increasing price that leads to an increased demand for the more expensive service.

There has long been anecdotal evidence in the fac-

ial plastic surgery community that increases in the price of cosmetic procedures may lead to increases in the de-

mand for those procedures. There are, however, to our knowledge, no data in the literature to support these an-

cecdotes. This study tests the hypothesis that cosmetic plastic surgery procedures function as luxury goods in a free marketplace, ie, follow the laws of an upward-sloping de-

mand curve. Given that cosmetic plastic surgery is in-

deed an elective, out-of-pocket, luxury item, it seems that this hypothesis makes plausible sense. The general geo-

graphic and temporal trends in cosmetic facial plastic sur-

gery procedure cost have already been published else-

where,3 and this study analyzes those data with regard to our economic hypothesis.

For demographic characteristics, this study population was relatively homogeneous, with most respondents being approximately 46 years old, male (93.9%), and almost 15 years in practice. Most respondents (81.1%) work in the private practice setting, and although there was a wide range in the cosmetic nature of each practice, the average respondent’s practice was approximately 40% cosmetic. Most of those surveyed (69.3%) used some form of marketing; however, this represented only a small fraction (5.1%) of most respondents’ annual overhead.

The geographic and temporal trends in procedure cost and frequency have been previously published.3 These previously published data show that from 1989 to 1999 there has been an increase in aging face procedure frequency and cost, while rhinoplasty frequency has actu-

ally declined. In addition, there were important re-

gional differences, with the East found to have significantly fewer aging face procedures on an annual basis, with equal numbers of rhinoplasties when compared with the West, Midwest, and South. This previous study also found that the variables that are associated with increased demand for cosmetic facial plastic surgery procedures include age, years in practice, and the percentage of overhead spent on marketing. The strongest correlates with cosmetic procedure demand, however, are the actual prices of these procedures, as represented by surgeons’ fees and total pa-

tient charges (P=.008). For example, the annual num-

ber of face-lift procedures is only weakly correlated with the surgeon’s age (r = 0.20, P = .004), but is strongly correlated with the surgeon’s fee for that procedure (r = 0.47, P < .001).3

Comparing the percentage that a given practice was cosmetic with these measurements of procedure price revealed a significant association of increasing price with increasing cosmetic percentage (Table 1). In addition, when the cosmetic percentage was stratified into 50% or
greater or less than 50% cosmetic, there was a statistically significant increase in fees associated with the more cosmetically oriented practices when compared with those that are less cosmetic (Table 2).

Multiple regression analysis correcting for other associated confounding variables (age, years in practice, and marketing percentage) revealed strong linear correlation of increasing price with increasing cosmetic procedure demand, particularly for the aging face procedures (Table 3). For instance, after these corrections, increasing surgeons’ fees for face-lifts were significantly correlated with increased annual number of face-lifts performed. This relationship was investigated for each of the procedures studied, across all US regions, and for 1999 and 1989. Figure 1 shows the linear curve fit generated for this model, comparing face-lift fees with the annual number of procedures performed in 1999. This curve represents an upward-sloping demand curve, with increased price associated with increased demand. Because regional and temporal differences in the cost and frequency of these procedures were previously shown, we also tested this model for each US region, and on a state-by-state basis. For example, Figure 2 and Figure 3 show similar linear relationships for the East and California, respectively; in both cases, the same upward-sloping demand curve is represented, with a significant association of increased price and increased demand. Linear regression analysis of this same relationship in 1989 also revealed a similar curve fit, albeit with a less strong statistical association (Figure 4). The other 3 procedures evaluated in this study (brow-lifts, blepharoplasty, and rhinoplasty) also showed upward-sloping linear trends, with significant associations of increased price and increased demand (Figures 5, 6, and 7, respectively).
An analysis of the cost outcomes of facial plastic surgery procedures is an important component of outcomes research in general, and allows one to begin to understand the intricacies of the relationships between price, supply, and demand for cosmetic procedures.6 Researchers7,8 have advocated that there is a need for increased efforts on the part of all plastic surgeons to better quantify, measure, and assess outcomes of cost and effectiveness, if there is to be a more rigorous and scientific approach to the comparison of plastic surgery outcomes in general.

Although other studies 1-3 have argued that aesthetic plastic surgery procedures may respond in traditional ways to market forces, this study found that cosmetic facial plastic surgery procedures do not. In fact, these procedures appear to function as luxury goods, exhibiting a variant demand behavior that creates an upward-sloping demand curve. For each of the procedures studied, across all US regions, and for both periods of interest, increasing price was associated with increased, rather than decreased, demand, as measured by the annual number of procedures performed.

Looking more closely at 2 other recent economic analyses of aesthetic plastic surgery procedures may reveal the reason for this apparent contradiction. The first study, by Krieger and Shaw,1 examines the effect that dividing fees in half in a residents’ clinic had on the number of aesthetic procedures performed. Although the researchers show a large (250%) increase in procedures, in reality the numbers were quite limited (from 4 to 14...
and the study was conducted for only a 4-month period, without mention of other confounding factors, such as the change in residents and their relative interest in recruiting patients undergoing aesthetic procedures during that period. More important, the setting of a residents’ clinic does not capture the luxury quality of cosmetic plastic surgery procedures in the private practice, real-life setting. It is quite possible that patients who are seeking aesthetic surgery in a residents’ clinic may be looking for the least expensive procedures from the start and, thus, it makes sense that a decrease in price may lead to increased demand. This, however, simply represents one limited aspect of a spectrum of patients undergoing aesthetic surgery, and misses most patients who would not seek an aesthetic procedure in the setting of a teaching clinic.

The second study, also by Krieger and Shaw,2 compares the fees for aesthetic procedures cross-sectionally in 3 US states with different plastic surgeon densities. They found that, after correcting for cost-of-living differences, increased surgeon supply was associated with decreased surgery fees. Changes in demand or in number of procedures were not measured in this study. In addition, as a cross-sectional study, there was no way to assess changes in actual supply in specific geographic regions, and correcting for regional differences was impossible. Unfortunately, this study appears to mistake measurements of supply with the measurement of demand needed to create an accurate demand curve for aesthetic procedures. In fact, the curves that they present appear to be mislabeled and make little economic sense. For example, in Figure 1 of their study, the y-axis denotes price per procedure, yet the x-axis represents the quantity of surgeons rather than the quantity of procedures. In this way, Krieger and Shaw have essentially combined the elements of what should be 2 separate demand curves into 1. Furthermore, looking at the raw data presented in the article reveals that in actuality the state with the highest supply of plastic surgeons (New York) did indeed have the highest fees as well. It is only after the researchers’ correction for cost of living that this relationship reverses. It is unclear if such a correction is justified or even advisable in this setting. For instance, in our own study, we found that a significant amount of the cosmetic surgery business (8.5%) came from out of state. Some of those physicians surveyed who have the highest fees and largest practices (>130 face-lifts annually) reported up to 80% of their business coming from out of state. For this reason, cost-of-living corrections do not seem to make sense, as many patients pay for procedures in cities or areas of the country in which they do not reside or work. In any case, it is unclear whether the relationship between supply and price that Krieger and Shaw describe is truly related to an economic phenomenon or whether it is simply the product of these statistical corrections.

The main limitation of our study is the low response rate (15.3%) from those American Academy of Facial Plastic and Reconstructive Surgery members surveyed. Unfortunately, given the sometimes sensitive nature of price issues, this poor response may have been unavoidable. Those members who did respond, however, represented a good sampling of the American Academy of Facial Plastic and Reconstructive Surgery community, with a wide range of procedure types (eg, 0%-100% cosmetic), frequency (eg, 0-275 reported face-lifts per year), and cost (eg, $1750-$12,500 for face-lift surgeons’ fees). Fortunately, with 264 respondents, we were able to perform most statistical analyses without limitations of study number and with enough power to show statistically significant differences.

What is the reason that there would be increased demand for aesthetic surgery procedures with higher prices? There appears to be an intangible quality associated with certain expensive luxury goods and services that attracts the consumer and creates the perception that such a good or service is superior to similar, less expensive products. Marshall4(p106) highlights this intangible quality when he writes:

"The current prices of such things as...highly skilled medical assistance [may be] so high that there is but little demand for them except from the rich: but what demand there is, often has considerable elasticity. Part of the demand for the more expensive kinds...is really a demand for the means of obtaining social distinction, and is almost insatiable."

Clearly, it is difficult, if not impossible, to distinguish between the myriad of factors that makes a consumer choose one plastic surgeon over another. Reputation is a complex characteristic to understand, and at least part of what constitutes a good reputation is related to having happy patients who have had good surgical results. As Marshall4 notes, however, as with any luxury good purchase, the perception that an expensive service is better than another less expensive service may be related to factors of prestige, status, and social distinction rather than more concrete differences. And even though the consumer is free to substitute a less expensive similar service (eg, surgeon), the status-conscious consumer does not. In this way, increased pricing may act to increase demand by instilling a sense of this prestige, status, quality, or distinction.

**CONCLUSIONS**

There is a significant association between increasing surgeons’ fees and total charges for cosmetic facial plastic surgery procedures and increasing demand for these procedures, as measured by their annual frequency. After a multiple regression analysis correcting for confounding variables, this association of increased price with increased demand holds for each of the 4 procedures studied, across all US regions, and for both periods surveyed. Cosmetic facial plastic surgery
procedures appear to function as luxury goods in a free marketplace, with an increase in price associated with an increase in demand and an upward-sloping demand curve. Thus, this stands in sharp contrast to the classic economic model in which demand declines as price increases. Economic methods can be used to evaluate cosmetic procedure trends; however, these methods must be founded on the appropriate economic theory.

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