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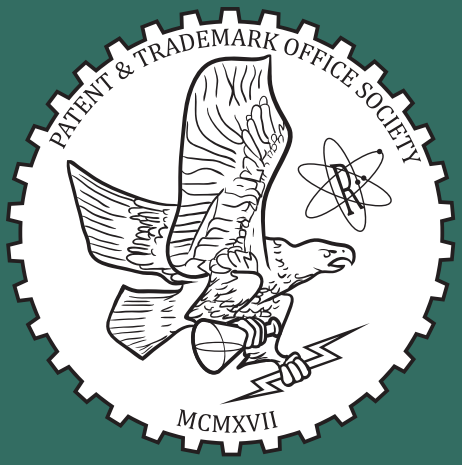

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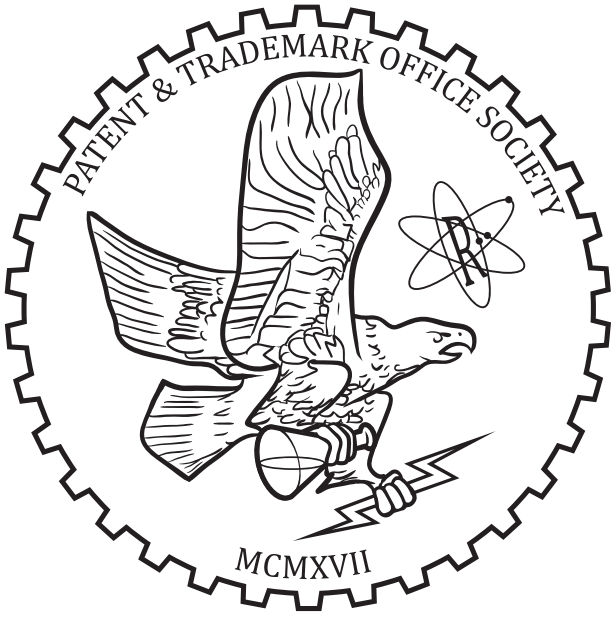

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The Use of Conjoint Analysis in High-Stakes Litigation: A Historical Review up to *Navarro et. al., v. Procter and Gamble*, Which Withstood a Rigorous *Daubert* Challenge[1]

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Abstract

The use of conjoint analysis has become increasingly common in litigation including in, among others, patent infringement cases (for example, how much does the patented feature increase the value of the overall product), deceptive advertising cases (for example., how much demand was driven by the representation of a product as "organic"), copyright infringement cases (for example, how much profit was driven by the use of a copyrighted image on product packaging), product liability cases (for example, how much of a car's overall sales are driven by the inclusion of antilock brakes), and data privacy cases (for example, how much do users value their personal information). As the use of conjoint analysis has increased, so have the incidences of courts rejecting these types of analyses. This article: (1) reviews the mechanics of conjoint analysis; (2) briefly summarizes recent matters where the approach was used and accepted (or rejected) by the courts; (3) draws some inferences based on these cases; and (4) concludes with a detailed presentation of a recent case where conjoint analysis was successfully used resulting in a detailed court opinion that is summarized here. The objective of this article is to provide the reader with a comprehensive overview of the current state of the art in the use of conjoint analysis in litigation.

[1] *Jaci* L. Overmann *is a Partner at Dinsmore* & Shohl LLP and was counsel for defendants in Annette Navarro, et al., v. Procter & Gamble Company, et al., Case No. 1:17-cv-406, 2021 U.S. Dist. LEXIS 43140 (S.D. Ohio Mar. 8, 2021), which is discussed in part III of this article. George Derpanopoulos is Manager at Analysis Group, Inc., and C. Paul Wazzan is Senior Managing Director at FTI Consulting, Inc. Derpanopoulos and Wazzan were retained by defense counsel in *Navarro* to support a testifying conjoint expert. The views expressed herein are those of the authors and not necessarily the views of Dinsmore & Shohl LLP, Analysis Group, Inc., or FTI Consulting, Inc., their management, their subsidiaries and affiliates, or other professionals, nor their clients.

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Introduction

Conjoint analysis is a marketing science method that can be described as a survey experiment combined with statistical analysis. It is used to generate data on consumers' choices and infer consumers' valuation of products' features.[2] It is well established in the academic literature, and has been used in commercial litigation matters since at least 2006.[3] It is also being used with increasing frequency, as demonstrated by the fact that conjoint analysis has been the subject of nearly 15 court decisions in 2021 alone—approximately 10 percent of all conjoint analysis case citations since 2006—involving parties such as Boeing, Apple, Mondelez, Honda, Ford, RiteAid, and Colgate-Palmolive. The most common uses for conjoint analysis in litigation are class certification and damages analyses in false advertising matters (for example, how much does the inclusion of the term "organic" on a product's packaging increase the value of the product), product liability matters (for example, how much of a car's overall sales are driven by the inclusion of antilock brakes), and damages analyses in patent infringement matters (for example, by how much does the patented feature increase the value of the overall product).[4] For the first time, conjoint analysis withstood rigorous scrutiny in a copyright infringement action in March 2021 in *Annette Navarro, et al., v. The Procter & Gamble Company, et al.*[5]

It should be noted at the outset, though, that courts appear to reject conjoint analysis at the *Daubert* or class certification state almost as frequently as they allow these analyses to stand; one might even take the position that courts are rejecting such studies with increasing frequency.[6] It is our supposition then, that as conjoint analysis becomes more widely utilized in litigation and its strengths and weaknesses become codified in court opinions, the bar for acceptance is increasing. Consequently, careful consideration of the appropriate economic conditions and facts allowing for the proper use of a conjoint analysis as well as careful attention to its design and implementation is increasingly critical.

In the following sections, we: (1) review the mechanics of conjoint analysis; (2) summarize recent high-profile matters involving conjoint analysis and draw inferences from those matters; and (3) conclude with a detailed review of the conjoint analysis in *Navarro* and the ensuing *Daubert* challenge, defense and the court ruling.

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[2] *See* Moshe Ben-Akiva, Daniel McFadden & Kenneth Train, *Foundations of Stated Preference Elicitation: Consumer Behavior and Behavior and Choice-based Conjoint Analysis in* Foundations and Trends in Econometrics, 10 (1-2), 1–144 at 1–35 (2019). *See also infra* part I.

[3] *See* Schwab v. Philip Morris USA, Inc., 449 F. Supp. 2d 992 (E.D.N.Y. 2006) (conjoint analysis used in tobacco class action to show the value and importance of health risks to "light" cigarette consumers in their decision to purchase a "light" cigarette).

[4] *See infra* part II.

[5] *See supra* note 1. The analysis in this article relies solely on publicly available information. In *Navarro*, the defense retained an expert who submitted a report based upon a conjoint analysis survey detailing what portion of the profits at issue in the litigation were attributable to the alleged infringement. This report was vigorously attacked and defended in *Daubert* briefings by the respective parties. Ultimately, the court delved deeply into the mechanics of conjoint analysis before issuing a highly detailed opinion that denied the *Daubert* motion. *See infra* part III.

[6] *See infra* part II.

I. An Overview of Conjoint Analysis

Conjoint analysis has been widely employed in marketing research over the last 50 years.[7] A Google Scholar search for the term "conjoint analysis" currently returns over 80,000 titles.[8] The American Marketing Association offers several courses for practitioners on how to use conjoint analysis.[9] By one estimate, "[i]t is likely that well over 14,000 conjoint analysis projects are conducted worldwide per year."[10] Many of these projects are carried out by marketing professionals in commercial research to identify the importance of product attributes and inform pricing decisions. For example, General Motors and Microsoft are among the many companies that have used conjoint analysis to decide which attributes their new vehicle and software products, respectively, should have, as well as how to price those attributes.[11]

Conjoint analysis is a survey-based statistical tool used for measuring consumer demand for products that can be readily described to survey respondents as a collection of "attributes" (for example, product features) that jointly drive purchase decisions. For example, a smartphone may be described as a combination of attributes such as color, brand, screen size and quality, data capacity, camera quality, ruggedness, and price (for example, Silver iPhone with 5.8" OLED screen, 256 GB capacity, dual 12 MP camera, and water resistance up to two meters depth, sold for $400).[12]

In a conjoint analysis, respondents are presented with 12 to 20 alternative and unique sets of products, known as "choice sets" or "store shelves," and asked to select which, if any, product they would buy if the products in front of them were the only ones available.[13] Each choice set typically includes three to four products, as well as an outside option commonly displayed as "None: I would not buy any of these products."[14] If one wanted to determine the amount that consumers would pay for "organic" vs. "non-organic" apples, the following choice sets shown in Table 1 are illustrative:

[7] Paul E. Green, Abba M. Krieger & Yoram (Jerry) Wind, *Thirty Years of Conjoint Analysis: Reflections and Prospects in* Interfaces, 31(3 Supplement), S56–S73 (2001).

[8] https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=%22conjoint+analysis%22&btnG= (last accessed on September 23, 2021).

[9] *See, e.g.,* Discrete Choice Analysis, https://www.ama.org/listings/2020/05/06/discrete-choice-analysis-7/ (last accessed May 2, 2022) and Sawtooth Software, https://www.ama.org/listings/2019/09/12/sawtooth-software/ (last accessed May 2, 2022).

[10] Bryan K. Orme, Getting Started with Conjoint Analysis: Strategies for Product Design and Pricing Research 127 (2nd ed., 2010).

[11] *Id.* at 130-131, 136-139.

[12] Jonathan Tomlin, and Robert Zeithammer, *Product Labeling Class Actions - Identifying the 'Con' in Conjoint Surveys*, Bloomberg Law, https://news.bloomberglaw.com/class-action/insight-product-labeling-class-actionsidentifying-the-con-in-conjoint-surveys (last visited May 2, 2022).

[13] The type of conjoint analysis described in this section – and typically employed in expert testimony for litigation – is known as Choice-Based Conjoint analysis ("CBC"). CBC has gradually become the predominant type of conjoint analysis, as it "closely mimic[s] the purchase process for products in competitive contexts." Bryan K. Orme, *Which Conjoint Method Should I Use?*, Sawtooth Software Research Paper Series, 1-6, at 1-2 (2013), https://www.sawtoothsoftware.com/support/technical-papers/general-conjoint-analysis/which-conjoint-method-should-i-use-2009).

[14] Though allowing an outside option is not obligatory in CBC, it is recommended. (Sawtooth Software. (2016). Lighthouse Studio v9.0.at 379.)

Table 1: Example of Choice Sets for Organic vs. Non-Organic Apples

Choice Set 1	Fuji, organic, $1.50	Red Delicious, non-organic, $.75	Granny Smith, organic, $1.25	Honeycrisp, non-organic, $1.60	Would not Buy Any
Choice Set 2	Red Delicious, organic, $1.75	Honeycrisp, organic, $2.40	Granny Smith, organic, $1.25	Fuji, non-organic, $.90	Would not Buy Any
Choice Set…					
Choice Set 20	Fuji, non-organic, $.90	Red Delicious, non-organic, $.75	Fuji, organic, $1.50	Honeycrisp, non-organic, $1.60	Would not Buy Any

Once respondents' choices are recorded, statistical analysis is used to estimate a model of consumer demand that captures the preferences of each respondent.[15] Using the estimates from this model, the expert can apportion consumers' willingness to pay for each product across its various features, derive each product's price elasticity of demand, and calculate each product's share of the simulated market—among other potential analyses. In the example shown in Table 1, one could determine how much extra money respondents would pay, on average, for organic apples.

Crucially, the products included in the survey's choice sets need not all be currently actually offered in any market (for example, due to technological, business, legal, or other reasons). As long as these products are adequately represented to survey respondents, by statistically analyzing respondents' choices across the various choice tasks with their distinct products and features, conjoint analysis can estimate current consumer demand for products that might be offered in the future (for example, iPhone with 9" screen[16]) and even products that might never be offered (for example, Samsung phone with Apple logo).[17] In other words, by combining a properly designed and executed survey with sophisticated statistical analysis, conjoint analysis can predict the purchasing choices of the sampled population facing an arbitrary set of products constructed from the set of measured product features—whether existing or hypothetical.[18]

[15] Peter J. Lenk, Wayne S. DeSarbo, Paul E. Green & Martin R. Young, *Hierarchical Bayes Conjoint Analysis: Recovery of Partworth Heterogeneity from Reduced Experimental Designs*, 15 Marketing Science 173 (1996).

[16] Currently, the largest screen offered on an iPhone is 6.7". Best big phones in 2022: Top phablets 6 inches or larger, https://www.tomsguide.com/best-picks/best-big-phones (last accessed on August 23, 2021).

[17] For a discussion of recent cases in which courts have analyzed the extent to which conjoint analyses pass the *Daubert* standard, *see infra* part II.

[18] Dick R. Wittink & Philippe Cattin, *Commercial Use of Conjoint Analysis: An Update*, 53 Journal of Marketing 91–96 (1989); Olivier Toubia, *Conjoint Analysis*, *in* Handbook of Marketing Analytics (2018).

II. A Brief History of Legal Cases Involving Conjoint Analysis

The following section presents an overview of the relevant facts of recent high-profile cases where conjoint analysis was employed.[19] The objective is to give a robust, though not necessarily exhaustive, overview of the outcome of these matters.

A. False Advertising

One of the most common areas where conjoint analysis is used is in false advertising matters, which typically manifest as putative class actions. For example, a phrase or word or image is alleged to be false and an attempt is made to estimate what a consumer might have paid for the product in the absence of the allegedly misleading information.

1. Hadley v. Kellogg Sales Co.

Plaintiffs alleged a cereal manufacturer made misleading statements on packaging, stating that the product was "heart healthy."[20] In an effort to show the "predominance" prong of the class certification test,[21] Plaintiffs retained an expert who proposed use of conjoint analysis to establish that the misrepresentations caused consumers to pay more for Kellogg's products than they otherwise would have paid. The conjoint survey proposed asking respondents to choose between hypothetical cereal products that differ in brand, flavor, labeling statements, price, and biscuit size.[22]

Defendant argued that the conjoint analysis failed to satisfy the predominance prong because it would only: 1) measure customers' willingness to pay, or demand, but not account for supply considerations[23]; and 2) the methodology of the conjoint analysis model was so flawed that it was doomed under a *Daubert* analysis.

The court held that the analysis adequately accounted for supply-side factors because it: 1) utilized prices that mirrored those actually in the market based on sales data; and 2) held the product quantity constant by using quantities of the challenged products that were actually sold during the class period in order to account for the

[19] Each of these cases have protracted procedural histories leading up to and often following decisions regarding conjoint analysis. For purposes of this article, the summaries are focused on the factual analysis of the conjoint analysis.

[20] Hadley v. Kellogg Sales Co., 324 F. Supp. 3d 1084 (N.D. Cal. 2018).

[21] Among the requirements to certify a class under Fed. R. Civ. P. 23(b), plaintiffs must show that "the claims or defenses of the representative parties are typical of the claims or defenses of the class." Fed. R. Civ. P. 23(a). "Although individual damages calculations alone do not make class certification inappropriate under Rule 23(b)(3), the United States Supreme Court has held that the plaintiff bears the burden of providing a damages model showing that 'damages are susceptible of measurement across the entire class for purposes of Rule 23(b)(3).'" *See Hadley,* 324 F. Supp. 3d at 1103.

[22] *Id.* at 1103.

[23] This has been a common historical reason for conjoint analysis to be excluded from litigation. *See, e.g.*, Zakaria v. Gerber Prods. Co., 755 Fed. Appx. 623, 624 (9th Cir. 2018)(finding that the district court did not abuse its discretion in concluding that the conjoint analysis there "was inadequate for measuring class-wide damages on the basis that the model failed to 'reflect supply-side considerations and marketplace realities that would affect product pricing'"); *In re* Gen. Motors LLC Ignition Switch Litig., 407 F. Supp. 3d 212, 237 (S.D.N.Y. 2019) (finding "demand-side-only evidence...fails to estimate hypothetical market conditions"); Apple, Inc. v. Samsung Elecs. Co., Case No. 11-cv-01846-LHK, 2014 U.S. Dist. LEXIS 29721 at 12 (N.D. Cal. Mar. 6, 2014) (rejecting a conjoint analysis because it did not "account for supply at all...."). Although, with particular attention at the design, issues associated with the supply-side considerations may be addressed. *See, e.g.*, Bailey v. Rite Aid Corp., Case No. 4:18-cv-06926 YGR, 2021 U.S. Dist LEXIS 81654 at 49 (N.D. Cal. Apr. 28, 2021) (finding that the conjoint analysis in that case did account for supply-side factors).

fact that the quantities of each cereal product are fixed as a matter of history.[24] The crux of the court's analysis was whether actual market data was the basis for the pricing in the survey and whether the quantities of product were fixed in accordance with their status as past sales.

The court went on to conduct a *Daubert* analysis because a class could not be certified in the instant case if the conjoint analysis model was inadmissible and determined to be the only damages model that satisfied the predominance prong of the class certification test.[25] The court was not persuaded by the myriad of methodological challenges lodged by Kellogg, including failure to mimic real-life shopping experiences, failing to include additional critical attributes that consumers consider, failure to account for distinct purchasing behaviors of repeat buyers, and focalism bias.[26] In particular, the court noted that "conjoint analysis is widely-accepted as a reliable economic tool ... and the concerns that Kellogg raises are nowhere near severe enough" to turn the conjoint analysis into "unreliable 'junk science.'"[27]

2. *Townsend v. Monster Beverage Corporation*

Plaintiffs sought to certify a class action against Monster Beverage Corporation ("MBC") alleging, among other things, false advertising on certain Monster-branded beverages.[28] Plaintiffs retained a damages expert in support of their motion for class certification to "develop an economic loss model to quantify the damages … attributable to [] four misstatements."[29] Table 2 reflects the alleged false advertising statements and the phrases tested by the expert in his analysis. The reader is asked to note and retain the differences.

Table 2: Alleged False Advertising Statements vs. those Tested by Plaintiffs' Expert

MBC Alleged False Statements	Statements Tested by Plaintiffs' Expert
Hydrates Like a Sports Drink	Hydrates like a Sports Drink
Re-hydrate	RE-HYDRATE to Bring You Back
Consume Responsibly — Max 1 can every 4 hours, with limit 3 cans per day. Not recommended for children, people sensitive to caffeine, pregnant women or women who are nursing	"Safe level of consumption incorrectly specified on label" or "Safe level of consumption correctly specified on label"
It's an ideal combo of the right ingredients in the right proportion to deliver the big bad buzz that only Monster can	Ideal Combo of the Right Ingredients in the Right Proportion

[24] *See Hadley*, 324 F. Supp. 3d at 1106.
[25] *Id.*
[26] *Id.* at 1107–09.
[27] *Id.* at 1110 (citation omitted).
[28] Townsend v. Monster Bev. Corp., 303 F. Supp. 3d 1010 (C.D. Cal. 2018).
[29] *Id.* at 1019–20.

Relying on his conjoint analysis, Plaintiffs' expert opined that consumers would have paid $1.82 less per can if one eliminated the alleged false statements.[30] The court, however, found that the opinions were unreliable and irrelevant where the conjoint analysis presented respondents with materially different versions of the statements, like it did in statements (2), (3), and (4) as shown in Table 2. Accordingly, the court held that the results, conclusions, and testimony regarding those three statements were irrelevant and unreliable, and therefore had to be stricken.[31] Going further, the court noted that the expert's conjoint analysis allowed respondents to select as many attributes as they wanted in response to the question "why do you purchase Monster more than (or instead of) other brands?" and that only 7.3 percent of respondents selected the "Hydrates" statement as a factor in their purchasing decision. Consequently, the court ruled that the entire opinion was not probative.[32]

3. Morales v. Kraft Foods Group, Inc.

Plaintiffs alleged defendant misled consumers by using the term "natural cheese" on its "Natural Cheese Fat Free Shredded Fat Free Cheddar Cheese" in violation of California law.[33] Plaintiffs retained a damages expert who designed and administered a conjoint analysis that attempted to show that customers were willing to pay more for a cheese labeled "natural." The study presented respondents, who were identified as those who placed importance on the "natural" attribute in making their purchase decision, with decision situations

> where they are asked to choose one product from a choice set of items (presented with prices), consisting of cheese items corresponding to (a) the marketplace offerings of some leading manufacturers and (b) Kraft's shredded fat free cheddar cheese product as it was offered in the marketplace with the "natural cheese" label, and/or (c) a product that is identical to Kraft's shredded fat free cheddar cheese product as it was offered in the marketplace except that it is without the "natural cheese" label.[34]

Defendant claimed the analysis was flawed in three ways: 1) the expert failed to survey the correct group because he did not specifically ask whether the respondent had purchased the product at issue in the last six months; 2) the expert could not calculate damages using conjoint analysis because it is not a proper methodology for false advertising damages as a matter of law; and 3) the expert used flawed conjoint analysis methodology. The court rejected the first argument saying that there is no requirement that the universe of those surveyed overlap entirely with the class.[35] The court rejected the second argument stating that Ninth Circuit courts frequently allow conjoint analysis to calculate damages.[36] And, lastly, the court rejected "several

[30] *Id.* at 1020.
[31] *Id.* at 1024.
[32] *Id.* at 1047.
[33] Morales v. Kraft Foods Grp., Inc., No. LA CV14-04387 JAK (PJWx), 2017 U.S. Dist. LEXIS 97433 (C.D. Cal. June 9, 2017).
[34] *Id.* at 8–9.
[35] *Id.* at 37.
[36] *See*, *e.g.*, Apple, Inc. v. Samsung Elecs. Co., Ltd., No. 12-CV-00630-LHK, 2014 U.S. Dist. LEXIS 24506 at 17 (N.D.

challenges to the design and methodology"[37] of the survey as relating to the weight of the expert testimony, not the admissibility.[38]

4. Schechner v. Whirlpool Corp.

Plaintiffs alleged they purchased Defendant's ovens based on deceptive marketing which claimed the product was "self-cleaning."[39] Plaintiff retained an expert to calculate the price premiums, on a class-wide basis, allegedly paid by consumers based on Whirlpool's alleged misrepresentation of the self-cleaning mechanism.[40] He administered a consumer survey by the internet to respondents who had identified themselves as having purchased a Defendant-manufactured oven, and asked them to choose among three hypothetical ovens that included some combination of various attributes like brand, oven type, fuel, finish cleaning figure, and price.[41] The expert concluded that an oven with "AquaLift self-clean" commanded a 10.58 percent price premium compared to hypothetical ovens described as "AquaLift partial-clean."[42]

Defendant moved to strike Plaintiff's conjoint analysis as flawed because: 1) customers have different meanings of "self-clean;" 2) the expert exaggerated "AquaLift self-clean" over his "AquaLift partial-clean" label; 3) the expert allowed focalism bias; and 4) the survey failed to account for supply-side considerations.[43]

The court rejected these arguments saying that the survey was not so overly speculative or overly embellished to render it unreliable. The court also ruled that the alleged focalism goes to weight not admissibility and that the survey adequately accounted for supply-side considerations by basing its market simulations on real-world conditions.[44]

5. Krommenhock v. Post Foods, LLC

Plaintiffs brought action on behalf of a putative class of consumers who purchased 31 varieties of Defendant's products whose boxes contained a mix of 45 statements that Plaintiffs assert are rendered false and misleading given the amount of sugar added.[45] Defendant moved to exclude Plaintiffs and retained an expert to design, conduct, and analyze "nine conjoint surveys to estimate 'the price premia (measured in dollars and/or percentage terms) caused by the presence of the affirmative misrepresentations on boxes of [several of defendant's cereals],

Cal. Feb. 25, 2014); Guido v. L'Oreal, USA, Inc., No. 2:11-CV-01067-CAS, 2014 U.S. Dist. LEXIS 165777, 2014 WL 6603730 at 8 (C.D. Cal. July 24, 2014).

[37] These challenges included: 1) measuring only one attribute; 2) improperly telegraphing the purpose of the survey; 3) using unrealistic assumptions; 4) the process for calculating the average compensation was flawed. *Morales*, 2017 U.S. Dist. LEXIS 97433 at 43-54.

[38] *Id.* at 42.

[39] Schechner v. Whirlpool Corp., No. 2:16-cv-12409, 2018 U.S. Dist. LEXIS 221847 (E.D. Mich. Oct. 30, 2018).

[40] *Id.* at 8.

[41] *Id.* at 9.

[42] *Id.* at 10.

[43] *Id.* at 11.

[44] *Id.* at 12-18.

[45] Krommenhock v. Post Foods, LLC, 334 F.R.D. 552 (N.D. Cal. 2020).

meaning the difference in the value of these cereals or granola with the affirmative misrepresentations compared to the value of these cereals or granola without the affirmative misrepresentations.'"[46] The expert concluded that consumers, on average, would have consumed approximately 26-28 percent less cereal had they been aware of the omitted information.[47]

Defendant alleged that the conjoint analyses failed to separate and test the alleged 45 misrepresented statements apart from the value of the unchallenged or truthful statements. For example, Defendant alleges that the expert failed to account for the placement of the alleged misrepresented statements on the actual label and failed to account for or otherwise test unchallenged or truthful statements.[48] The court rejected this argument saying that the model, which presumes that the alleged misrepresented statements are false or misleading to a reasonable consumer, is an acceptable point for a damages model and any challenges otherwise to the methodology are relevant to weight not credibility. [49]

6. McMorrow v. Mondelez International

Plaintiff brings this suit on behalf of a class of consumers who purchased Defendant's breakfast biscuits as a result of Defendant's deceptive claims that the biscuits are "nutritious" despite the biscuits' high added sugar content.[50] Plaintiff retained an expert to design a conjoint survey that isolates and measures the value of the term "nutritious" by measuring the price premium of each entire challenged claim relative to the economic value attributable to the same claims without "nutritious."[51] The following pairs of claims, as show in Table 3, were compared:

Table 3: Challenging the Use of the Term "Nutritious"

Challenged Claim	Non-Challenged Portion
4 Hours of Nutritious Steady Energy	4 Hours of Steady Energy
Nutritious Sustained Energy	Sustained Energy
Nutritious Morning Energy	Morning Energy
Nutritious Steady Energy all Morning	Steady Energy all Morning

The expert designed the conjoint survey to measure any price premium attributable to the term "nutritious," which includes five features of the products that a survey respondent is asked to compare: brand, flavor, description of the front

[46] *Id.* at 574.
[47] *Id.* at 574-75.
[48] *Id.* at 576.
[49] *Id.*
[50] McMorrow v Mondelez International, No. 17-cv-2327-BAS-JLB, 2021 U.S. Dist. LEXIS 42885 at 2 (S.D. Cal. Mar. 8, 2021).
[51] *Id.* at 20. Plaintiff also retained a second expert who provided the framework for calculating class-wide damages—conjoint analysis. *Id.* at 8-9. He was challenged based on a failure to consider supply-side or competitive factors, but the court denied this *Daubert* challenge, and found that the allegation was for classic mislabeling and the changes in the market may be a relevant consideration but not a deficiency that would make the opinion inadmissible for class certification purposes. *Id.* at 17.

of the package, nutritional information on the front of the package, and "5-pack price."[52]

Defendant moved to exclude the conjoint analysis evidence because the survey omitted taste and actual product packaging and did not include a representative class because it did not account for repeat buyers.[53] The court rejected these arguments citing other cases where conjoint analysis was used to calculate damages and reiterating that objections on methodology of the survey relate to weight, not admissibility.[54]

B. Class Actions Beyond False Advertising

In addition to false advertising matters, one often sees conjoint analysis used in other putative class actions such as product defect matters.

1. MacDougall v. Am. Honda Motor Co.

The plaintiffs in this purported class action lawsuit included any person who bought or leased a 2011-2016 model year Honda Odyssey minivan, which were covered by a Basic Limited Warranty and an Express Powertrain Limited Warranty. Plaintiffs alleged that Honda breached these warranties by failing to fix certain transmission problems.[55] Plaintiffs retained an expert who designed a conjoint analysis that offered respondents a choice of five "packages" of four vehicle features[56] with assignable price values ranging from $500 to $2,500.[57] Defendants countered with a motion to strike the expert's opinions and a motion for summary judgement.

The court found that the prices Plaintiffs' expert assigned for the different features of his "packages" were not based on the actual market price for these features available between 2011 and 2016 but, rather, were based on the prices of similar features in 2019 upon which he exercised his "professional judgment."[58] While the court found that this "speculative valuation" in and of itself was sufficient to strike the report, it went further. [59] The court noted that the pretest administered to respondents to ensure that the questions were not confusing or misleading included thirty-two vehicle attributes while the final survey provided just four vehicle attributes.[60] The court ultimately found that this design choice undermined the reliability of the report because: 1) the value of the pretest is lost when the pretest and final survey are substantially different; 2) such a reduction fails to mirror real-world considerations where consumers are routinely confronted with a plethora

[52] *Id.* at 22-23.
[53] *Id.* at 26-27.
[54] *Id.* at 27.
[55] MacDougall v. Am. Honda Motor Co., No. SAVC 17-1079 JGB (DFMx), 2020 U.S. Dist. LEXIS 166786 (C.D. Cal. Sept. 11, 2020).
[56] The range of features included attributes such as engine size, horsepower, fuel tank capacity, MPG, blind spot information systems, and rear parking assist. *See* Expert Report of SB in Support of Plaintiffs' Motion for Class Certification, MacDougall v. Am. Honda Motor Co., No. SAVC 17-1079 JB (DFMx), Doc 166-2 at 47 (filed June 21, 2019).
[57] *Id.* at 16.
[58] *Id.* at 16–17.
[59] *Id.* at 17.
[60] *Id.* at 20–21.

of different options and features in vehicles; and 3) a remarkable 55.4 percent of individual responses reflected economically irrational choices.[61] Consequently, the court struck the expert's report and opinions in their entirety.

2. *In re* General Motors LLC Ignition Switch Litigation

The plaintiffs in this purported class action lawsuit included General Motors car owners whose vehicles were subject to recalls who sought to recover "economic losses" on the theory that they overpaid for their vehicles because "a car with a safety defect is worth less than a car without a safety defect."[62] Plaintiffs retained an expert who designed and administered a conjoint analysis to measure "consumers' desires by asking survey respondents about their relative preferences for certain combinations of product features and then used their responses to estimate the amount consumers would be willing to pay for a vehicle with a particular defect that was fully disclosed."[63] For example, the expert calculated how respondents would value a car with a *disclosed* side airbag defect by presenting them with the following survey question:

Table 4: Vehicle Feature and Disclosed Defect Choice Sets

Safety Feature	Choice 1	Choice 2	Choice 3	Choice 4
Collision avoidance system with automatic emergency braking	Not Included	Included	Included	Not Included
Blind Spot Warning	Not Included	Not Included	Included	Not Included
Rear View Camera	Included	Not Included	Not Included	Not Included
Information Revealed at Point of Purchase/Lease				
At point of purchase / lease, is manufacturer aware of a side airbag defect that would normally require immediate recall?	Yes	No, no defect	Yes	No, no defect
Actual timing of recall (based on when manufacturer officially notifies NHTSA of defect)	Recall immediately	No recall required	Recall more than one year after the date of purchase	No recall required
Defect may cause accidents with…..	Injuries but not fatalaties	No defect that would cause accidents	Fatalaties and Injuries	No defect that would cause accidents
Price total for the options	$2500	$1500	$2500	$2500

[61] *Id.* at 21–24.
[62] *In re* Gen. Motors LLC Ignition Switch Litig., 407 F. Supp. 3d 212, 237 (S.D.N.Y. 2019).
[63] *Id.* at 384 (internal citations omitted).

In its review, the court concluded that Plaintiffs' expert's conjoint analysis "is insufficient evidence" because the damages theory must be based upon the difference of what the Plaintiff paid for and the *fair market value* of what the Plaintiff received and this analysis only captured consumer's private valuations and did not account for the market value of the vehicles.[64]

3. Maldonado v. Apple, Inc.

Plaintiff brought suit on behalf of a class of individuals subject to Defendant's AppleCare Policy or AppleCare+ Plan purchased with an iPhone or iPad.[65] If a device has hardware issues, the Policy obligates Apple to repair it or to replace it with a device that is new or "equivalent to new in performance and reliability."[66] Apple replacements can be new or "remanufactured" from parts that are recovered from other returned Apple devices.[67] Plaintiffs alleged that remanufactured devices can never be as reliable as new devices because the load placed on used parts renders them less reliable.[68]

Plaintiffs presented an expert that assessed the difference in market value between new and remanufactured iPhones and iPads and determined that "iPhones and iPads experienced a reduction in market value, for the class during the class period, of 15.7 percent per iPhone and 14.1 percent per iPad, due solely to the fact that the devices were remanufactured, rather than new, at the time and point of first purchase."[69]

The defense moved to exclude the conjoint analysis evidence because the expert's analysis was based entirely on consumer preferences and failed to account for supply-side considerations. Defendant argued that using real-world data was less accurate than hypothetical data because it kept the supply considerations static when in reality they would have moved in response to demand.[70]

The court rejected this argument[71] stating that the real-world price and quantity data was reliable, for the purposes of *Daubert* analysis, simply because the supplier actually made those supply decisions.[72] The court further found that a jury could weigh the credibility of an analysis that bases its damages calculation on the assumption that the supply would remain fixed.[73]

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[64] *Id.*

[65] Maldonado v. Apple, Inc., No. 3:16-cv-04067-WHO, 2021 U.S. Dist. LEXIS 92483 (N.D. Cal. May 14, 2021).

[66] *Id.* at 2.

[67] *Id.*

[68] *Id.* at 4.

[69] *Id.* at 67.

[70] *Id.* at 69.

[71] Before doing so, however, the court did note the case law split on this point, as supported amply by the summaries of cases in this article alone. *Compare* Hadley v. Kellogg Sales Co., 324 F. Supp.3d 1084, 1106 (N.D. Cal. 2018); *In re* MyFord Touch Consumer Litig., 291 F. Supp. 3d 936, 969 (N.D. Cal. 2018); Fitzhenry-Russell v. Dr. Pepper Snapple Grp., Inc., 326 F.R.D. 592, 606 (N.D. Cal. 2018); *In re* Dial Complete Mktg. & Sales Practices Litig., 320 F.R.D. 326, 335 (D.N.H. 2017) (finding conjoint analysis adequately captured market value), *with e.g.*, MacDougall v. Am. Honda Motor Co., 2020 U.S. Dist. LEXIS 166786 at *5 (C.D. Cal. Sept. 11, 2020); *In re* Gen Motors LLC Ignition Switch Litig., 407 F. Supp. 3d 212, 240 (S.D.N.Y. 2019) (finding conjoint analysis did not adequately capture market value).

[72] *See supra* note 65 at 70 (specifically stating that "a conjoint analysis using real-world supply-side data [] satisfies *Daubert* and California law... [because r]eal-world price and quantity data is reliable for these purposes because, put simply, it is what the supplier firm actually did").

[73] *Id.* at 73.

C. Patent Infringement Damages

Finally, we often see conjoint analysis in the context of patent infringement cases where one is attempting to determine the incremental value of a particular patent (or feature) relative to the overall value of the product.

1. Visteon Global Techs., LLC v. Garmin International, Inc.

Plaintiff alleged patent infringement for three patents that generally involved navigation systems, accusing a variety of the defendants' products as infringing certain claims.[74] Plaintiff retained an expert who designed and administered a conjoint analysis survey, which attempted to determine the value that consumers place on certain variables such as points of interest, preview and route adjustment, turn preview display, and language display.[75] The actual proffered choice sets designed and used by Plaintiff's expert are shown Table 5:

Table 5: Three Navigation System Choice Sets

Points of Interest	Category Search ~~Keyword Search Across Categories~~	Category Search Keyword Search Across Categories	Category Search ~~Keyword Search Across Categories~~
Special Destination Selection	Type Address ~~Go Home Button~~ Recently Found	Type Address Go Home Button	Type Address ~~Go Home Button~~ Recently Found
Turn Preview Display	Zoom ~~Multi-Turn Arrow~~	Zoom Multi-Turn Arrow	Zoom Multi-Turn Arrow
Preview and Route Adjustment	Preview Adjust Preferences Detour Button	Preview ~~Adjust Preferences~~ ~~Detour Button~~	Preview ~~Adjust Preferences~~ ~~Detour Button~~
Language Display	English ~~French, Spanish, Italian, German, Dutch~~	English French, Spanish, Italian, German, Dutch	English ~~French, Spanish, Italian, German, Dutch~~
Price	$104.99	$109.99	$99.99

[74] Visteon Global Techs., LLC v. Garmin Int'l, Inc., No. 10-cv-10578, 2016 U.S. Dist. LEXIS 142395 at 2 (E.D. Mich. Oct. 14, 2016). U.S. Patent No. 5,544,060 is directed to a method of navigating a vehicle whereby a user can generate an optimal path and then switch to an alternate navigation path before beginning on the optimal path. U.S. Patent No. 5,654,892 is directed to a method for assisting the navigation of a vehicle whereby a complex arrow icon is generated ad displayed to the driver at a predetermined time or distance before the driver reaches a particular maneuver. U.S. Patent No. 5,832,408 is directed to a navigation system which allows the use to search a destination either from a list of categories or from an alphanumeric search. *Id.* at 2-3.

[75] *Id.* at 10.

Defendant argued that the conjoint survey contained fundamental flaws including: 1) the survey did not assess the actual patented functionalities but rather tested much broader features than the features at issue; 2) the survey failed to include distracter features thus focusing respondent explicitly on the patented features; and 3) the methodology improperly takes data from the expert's "economic values" to support the royalty damage calculation.[76] The court excluded the expert's testimony, based in large part on the fact that the study "did not attempt to determine a real-world price for the four patented features, and did not endeavor to value any non-patented features or to determine the value of the four patented features relative to the multitude of non-patented features in the accused devices."[77]

2. Qualcomm Inc. v. Apple Inc.

This is a patent infringement action based upon a patent that provides for an improved phone battery life.[78] Defendant Apple moved to exclude the expert testimony calculating a reasonable royalty, which was based on a conjoint survey.[79] Defendant argued that the surveyed features were not tied to the infringed claims and that the survey failed to apportion the value of the patented versus unpatented features of the phone.[80] The court rejected the former argument stating that the survey adequately, rather than erroneously, equated at least some of the alleged benefits to the asserted claims. The court rejected the latter argument by saying a failure to apportion the value of patented features versus unpatented features relates to the weight of the survey and not the admissibility.[81]

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Our review of these cases has demonstrated that conjoint analysis has been adapted to a number of different types of matters, and that the courts have accepted or rejected the analyses in roughly equal measure. Careful attention must be paid to the development, application and interpretation of the results, and the construction of the model must be particularly rigorous so as to account for the known pitfalls, including, but not limited to: 1) failure to account for supply-side considerations; 2) focalism; 3) failure to use real-world data; 4) respondents being mismatched to plaintiffs; 5) failure to use accurate terms and/or descriptions. Table 6 summarizes the cases reviewed in this section.

[76] *Id.* at 5-6.

[77] *Id.* at 20. To emphasize the point, the court quoted the expert's testimony as follows: "It is important to recognize that these values do not represent the actual amounts consumers would be willing to pay for the inclusion of the patented features in a competitive market. It would be incorrect to suggest that these four patented features alone are responsible for $50.68 of the price of a GPS system. Price is primarily determined by three factors: consumer value, producer costs, and competition. I studied only one, consumer value." *Id.* at 21-22.

[78] Qualcomm Inc. v. Apple Inc., No. 17cv1375 DMS (MDD), 2019 U.S. Dist. LEXIS 9464 at 13 (S.D. Cal. Jan. 18, 2019).

[79] *Id.* at 14.

[80] *Id.* at 14.

[81] *Id.* at 15.

Table 6: Summary of Recent Cases Using Conjoint Analysis

Case Name	Type of Case	Conjoint Analysis Accepted or Rejected by the Court
Townsend v. Monster Beverage Corporation	False Advertising	Rejected
MacDougall v. Am. Honda Motor Co.	Warranty	Rejected
In re Gen. Motors LLC Ignition Switch Litigation	Warranty	Rejected
Visteon Global Techs., LLC v. Garmin International, Inc.	Patent Infringement	Rejected
Morales v. Kraft Foods Grp., Inc.	False Advertising	Accepted
Hadley v. Kellogg Sales Co.	False Advertising	Accepted
Schechner v. Whirlpool Corp.	False Advertising	Accepted
Qualcomm Inc. v. Apple Inc.	Patent Infringement	Accepted
Krommenhock v. Post Foods, LLC	False Advertising	Accepted
Maldonado v. Apple, Inc.	Warranty	Accepted
McMorrow v. Mondelez International	False Advertising	Accepted

III. *Annette Navarro, et al., v. The Procter & Gamble Company, et al*: A Detailed Analysis

Annette Navarro, et. al., v. The Procter & Gamble Company, et. al., is likely to be of particular interest to legal scholars and practitioners.[82] First, it is only the second instance where conjoint analysis has been used in a copyright infringement litigation and the first where it was one of the central issues.[83] Second, the study was initiated by the defense, a somewhat novel legal strategy—an artifact of how the burden of proof shifts to defendants in certain damages conditions. Third, the study was thoroughly critiqued by the plaintiff and survived a robust *Daubert* challenge providing a detailed and rich record of documents in the public domain. Fourth, the court in issuing its *Daubert* ruling provided an unusually detailed overview of conjoint analysis in general, thereby providing a succinct overview of the necessary criteria to make conjoint analysis helpful to the trier of fact.

[82] Annette Navarro, et al., v. Procter & Gamble Company, et al., Case No. 1:17-cv-406 (S.D. Ohio Jan. 10, 2019).

[83] The first instance was in 2011 in Oracle v. Google, Inc., No. C 10-03561 WHA, 2011 U.S. Dist. LEXIS 141399, at 7 (N.D. Cal. Dec. 6, 2011). The case related to Google's copying of the Java SE API and was litigated for more than ten years resulting in the recent U.S. Supreme Court decision in favor of Google based on fair use. Google LLC v. Oracle America, Inc., 141 S. Ct. 1183 (U.S. Apr. 5, 2021).

A. Background

Annette Navarro McCall and affiliated entity Navarro Photography LLC were hired by The Procter & Gamble Company to provide P&G with photos of models using Olay products for use in certain packaging and marketing materials.[84] The use of the photos was alleged to be governed by a contract between the parties (for example, how, where, and for how long the photos could be used by P&G).[85] Plaintiffs alleged that Defendants infringed her copyrights on twelve photographs (the "Images at Issue") that she had provided to P&G for use, pursuant to the alleged licensing arrangements, in the packaging of certain Olay products (the "Products at Issue").[86] In particular, Navarro alleged that P&G used the Image at Issue on the Products at Issue after the licenses expired and/or used the Images at Issue on products and geographic areas outside those covered by the alleged licensing agreements.[87]

Navarro sued P&G and Walmart for direct copyright infringement and P&G for vicarious and contributory copyright infringement and fraud.[88] Navarro sought, in addition to non-monetary relief, actual damages, disgorgement of profits, pre- and post-judgement interest, costs, attorneys' fees, and punitive damages.[89]

B. Damages for Copyright Infringement: Actual and Profit-Based

Under copyright law, assuming liability, Navarro would be entitled to recover "the *actual damages* suffered by … her as a result of the infringement, and any *profits* of the infringer that are attributable to the infringement and are not taken into account in computing the actual damages."[90] Typically, "actual damages" are calculated as the amount that the putative infringer would have paid to use the copyrighted material within the scope it was, in fact, used; for example, a "reasonable license fee" that a hypothetical willing licensor and licensee would arrive at in an arms-length negotiation informed by the standards of the relevant industry.[91] "Profit"-based damages would be based on the profits that P&G generated from the sale of products using Navarro's allegedly infringed copyrights in excess of Navarro's actual damages.[92]

The determination of profit-based damages involves two steps: (1) The copyright owner holds the burden of proof of (a) demonstrating a "reasonable relationship"

[84] Annette Navarro, et al., v. The Procter & Gamble Company, No. 1:17-cv-406, Doc. 247 (S.D. Ohio Jan. 19, 2021) ("MSJ Opinion") at 13.

[85] *Id.*

[86] Annette Navarro, et al., v. The Procter & Gamble Co., No. 1:17-cv-406, Doc. 257 (S.D. Ohio Mar. 8, 2021) ("*Daubert* Opinion") at 2.

[87] *Id.*

[88] Fifth Am. Complaint, Annette Navarro, et al., v. The Procter & Gamble Co., No. 1:17-cv-406, Doc. 133 (S. D. Ohio Feb. 14, 2020) ("Complaint") at ¶¶ 182-252.

[89] *Id.* at 54-55.

[90] 17 U.S.C. § 504(b) (emphasis added). Navarro disclaimed any entitlement to statutory damages. Annette Navarro, et al., v. The Procter & Gamble Company, No. 1:17-cv-406, Doc. 247 (S.D. Ohio Jan. 19, 2021) ("MSJ Opinion") at 98 n. 16.

[91] *Id.* at 75-76. Alternatively, actual damages from copyright infringement can be calculated as the plaintiff's lost profits from the infringement. *Id.* at 75 n. 17.

[92] *Id.* at 76.

between the alleged infringement and the infringer's gross revenue, and (b) identifying the infringer's revenue that is a product of this relationship;[93] (2) Importantly, the second step shifts the burden of proof to the infringer, who must (a) deduct any costs from the gross revenue at issue to arrive at the net profits at issue, and (b) determine what portion of the net profits at issue is attributable to infringing versus non-infringing activity ("apportionment").[94]

Crucially, if the infringer fails to put forth an admissible apportionment analysis, the copyright holder is entitled to all of the infringer's profits.[95]

C. Description of the Conjoint Analysis in *Navarro*

P&G retained an academic marketing expert to provide opinions on apportionment—the portion of profits from sales of the products at issue that could be attributed to use of the allegedly infringed images.[96] The expert was specifically tasked "to assess how Defendants' sales would change had the Images at Issue not been used on the packaging of the Products at Issue … –a so-called 'counter-factual' situation."[97]

Two counter-factual situations, or product packages, were posited for each Image at Issue: a "no-photo counter-factual" and a "different-photo counter-factual."[98] The former assumed that P&G would have removed the Images at Issue from the Products at Issue and would have not substituted them with alternative images; the different-photo counter-factual assumed that P&G would have substituted the Images at Issue with images of different models on the Products at Issue.[99]

Based on his experience, the expert determined that the appropriate method for fulfilling his assignment was conjoint analysis because "[i]n both the practitioner and the academic communities, [it is] the generally accepted method for measuring the impact of a counter-factual product feature on consumer preferences."[100]

[93] *Id.* at 76-77.

[94] *Id.* at 77. Apportionment is also referred to as "attribution" in copyright law.

[95] While understanding the importance of apportionment, the courts have long recognized that exact mathematical precision when considering such apportionment is difficult and often impossible. Consequently, the standard is somewhat more relaxed. For example, in a seminal 1940 case, the Supreme Court "referred to the difficulty of making an exact apportionment, and … observed that mathematical exactness was not possible," demanding "only reasonable approximation." Sheldon v. Metro-Goldwyn Pictures Corp., 309 U.S. 390, 404 (1940). Even today, precision remains a critical area in the law and one that the courts continue to grapple with; an authoritative treatise on expert testimony in business litigation notes that "[c]ourts have found apportioning sales value a subjective exercise." Elizabeth A. Evans & Peter P. Simon, *Economic Analysis of Nonpatent Intellectual Property Rights and Damages Measures in* Roman L. Weil, Daniel G. Lentz, Elizabeth A. Evans, Litigation Services Handbook: The Role of the Financial Expert, 23 (2017). Consequently, what the courts look for is analysis that is sufficiently tied to the facts of the case, and for opinions to be based on accurate information and those which can be evaluated as reasonable and reliable.

[96] The expert was also tasked to determine what portion of P&G's sales of products that appeared on mailer coupons that featured the Images at Issue were attributable to Navarro's images. Complaint at ¶¶ 154-181; Expert Report of Professor RZ, Annette Navarro, et al., v. The Procter & Gamble Company, No. 1:17-cv-406, Doc. 199-1 ("Expert Report") at ¶ 14. Because the expert used a different survey technique (balanced cross-over design) for that assignment and the Court denied Navarro's claim to damages on those sales, we do not explore this aspect of the matter. Expert Report at ¶¶ 96-122; MSJ Opinion at 82-86. Expert Report at ¶¶ 13-14.

[97] *Id.* at ¶ 16.

[98] *Id.* at ¶¶ 47.i, 72.i.

[99] *Id.* at Exhibits DF1 and FHR1. All counter-factual packages were provided to the expert by P&G.

[100] *Id.* at ¶ 16. In addition to conjoint analysis, the expert conducted two alternative but complementary analyses of the effect of the Images at Issue on demand for the Products at Issue: a "model-free measurement" and a "semantic differential question." (These analyses were conducted separately for each pair of Product at Issue and counter-factual image.)

In particular, conjoint analysis could measure consumers' demand for the Products at Issue with (1) the actual Images at Issue versus (2) the counter-factual images, all else equal.[101] By subtracting (2) from (1), conjoint analysis could thus arrive at an estimate of the effect of the Images at Issue on consumers' demand for the Product at Issue.[102] This effect could then be transformed into an estimate of the share of consumers' demand for the Products at Issue attributable to the Images at Issue—the target of the apportionment analysis.[103]

The expert proceeded to design surveys that met the six core requirements of a valid conjoint analysis:[104]

A. Representative sampling: After defining the target populations for the Products at Issue, the expert surveyed representative samples from those populations.[105]
B. Realistic attribute selection: The expert researched consumer behavior in the relevant product categories and consulted with a P&G marketing executive to develop an understanding of which products competed with the Products at Issue and which attributes drove consumers' purchasing decisions. He used this understanding to focus on the largest competitors of the Products at Issue[106] and the few, salient attributes of the products in his surveys.[107]
C. Faithful attribute representation: The expert designed his surveys to realistically mimic a market experience where consumers choose between competing products on (simulated) store shelves. To achieve that, he ensured that his surveys accurately depicted the attributes of all products included in the store shelves, whether they were one of the Products at Issue or a competing product.[108]

[The] former analysis involved comparing the share of respondents that selected (a) the actual Product at Issue with the Image at Issue versus (b) the Product at Issue with the counter-factual image in two choice tasks where the remaining two products in the choice set were the same. Since the only difference between the two choice tasks was the presence of the Image at Issue versus the counter-factual image on the Product at Issue, comparing (a) versus (b) produced a simple yet direct measurement of the effect of the Image at Issue on demand for the Product at Issue.

[The] expert's second alternative analysis, the semantic differential question, involved a side-by-side comparison of the Product at Issue with the Image at Issue versus the counter-factual image. Respondents were asked to select which package they preferred using a five-point scale. To decrease the risk of revealing the survey's purpose to respondents, this question was asked after all choice tasks for the conjoint analysis (and the model-free measurement) were completed.

[Though] the expert's model-free measurement and semantic differential question did not provide definitive estimates of apportionment in the way his conjoint analysis did, they did provide two independent – and, ultimately, corroborating – measurements of the likely direction and magnitude of the effect at the heart of his assignment. *Id.* at ¶¶ 52.4, 52.10, 58, 59, 64, 65, 77.4, 77.10, 83, 84, 89, 90 and Exhibit DF4.

[101] Each pair of (1) Image at Issue and (2) counter-factual image required a separate survey. Four conjoint analyses were conducted (two Images at Issue with two counter-factual images each).

[102] *Id.* at ¶¶ 54, 79.

[103] This estimate would be equivalent to the share of sales of the Products at Issue attributable to the Images at Issue. The sales share, in turn, could be transformed into a profit share. The latter transformation was, among other tasks, the assignment of a different expert retained by P&G. *See* Expert Report of SH, Annette Navarro, et al., v. The Procter & Gamble Company, No. 1:17-cv-406, Doc. 145-2.

[104] *See* Expert Report at ¶¶ 29-35 for a general description of those requirements.

[105] The expert's surveys were fielded online by a leading provider of online panels, which pays respondents for their time. The expert instructed the survey provider to draw representative samples from his target populations: U.S. adults for the first Product at Issue and U.S. female adults for the second Product at Issue. Between 440 and 635 respondents were sampled in each of the expert's four surveys. *Id.* at ¶¶ 44, 46, 57, 63, 71, 82, 88.

[106] To identify the eight largest competitors of the Products at Issue, the expert used data on the national retail sales of all products in the relevant product categories during the relevant time period from a leading vendor of market intelligence data. *Id.* at ¶¶ 47, 72.

[107] In addition to displaying each product's packaging and price, the selected attributes were the package's size, weight, volume, or count and its two most visually prominent claims; *e.g.*, "pre-moistened" and "kind to skin." *Id.* at ¶¶ 47, 72.

[108] This effort included researching the packaging images and prevailing prices from the relevant period for all products included in the surveys. *Id.* at ¶¶ 48, 73.

D. Avoiding "demand effects": Surveys that include too few product attributes can lead respondents to infer and select the answer expected by the expert, instead of responding truthfully. Such surveys suffer from "demand effects" and provide a biased estimate of respondents' preferences—in the direction of the expert's hypothesis. The expert designed his surveys so as to not draw undue attention to a particular product attribute, including, most importantly, the Images at Issue.
E. Avoiding biased questions: To avoid revealing the survey's purpose, the expert ensured that he never included the Product at Issue with both the actual and counter-factual package in the same choice task.[109] He also ensured that his surveys had no design feature that could steer respondents towards a particular product (for example, a Product at Issue), attribute (for example, its packaging), or attribute level (for example, the counter-factual image, instead of the Image at Issue).[110]
F. Screening out inattentive respondents: In every survey, some fraction of survey respondents typically does not pay attention to the questions and/or does not understand the instructions. Failure to exclude these respondents' answers from the analysis can bias the results and decrease their precision. The expert screened out inattentive respondents by excluding the fastest 10 percent of respondents as well as respondents that selected a "dominated option" in an attention check task—a product that was more expensive than an otherwise identical product.[111]

After respondents' answers to the choice tasks were collected, the expert analyzed them using state-of-the-art simulation-based statistical techniques tailored to conjoint analysis.[112] The results of these statistical analyses were predictions of each respondent's probability of choosing each product in the survey's store shelves—including the Product at Issue with the actual package and the counter-factual package.[113] After summing these probabilities across respondents, the expert arrived at predicted market shares for each product.[114] By comparing the predicted market shares of the two versions of the Product at Issue, one with the Image at Issue and another with the counter-factual image, the expert arrived at his best estimate of the effect of the Image at Issue on demand for the Product at Issue along with a measure of statistical uncertainty surrounding that effect.

[109] The expert included an open-ended question at the end of his surveys asking respondents about the survey's intent. Respondents' answers to these questions revealed that no respondent had guessed the purpose of the survey. *Id.* at ¶¶ 49, 74. As discussed *supra* in n. 100, the only time both packages were displayed side-by-side was the semantic differential question, which was asked after the choice tasks for the conjoint analysis.

[110] *Id.* at ¶¶ 50, 75.

[111] The attention check tasks appeared like all other choice tasks and were placed approximately half-way through the full set of choice tasks. In addition to the "none of the above" option, one of the attention tasks listed the following three products, from left to right: Burt's Bees for $9.79, Simple for $7.99, and Simple for $6.99. (A different set of products and prices was used in the survey for the second Product at Issue.) The second option is dominated by the third, which involves buying the same product for $1 less. Thus, selecting the dominated option signaled respondent irrationality or inattention. The expert designed a second-choice task that included a dominated option, though he did not place the dominated option next to the dominant one and used a price difference of $0.50 between the two otherwise equal products. However, that attention check seemed too demanding for respondents, hence the expert decided not to use it as a screen. *Id.* at ¶¶ 51, 76.

[112] The expert designed and fielded his surveys and analyzed respondents' answers using Sawtooth Software, the leading software for conjoint analysis. *Id.* at ¶¶ 52, 53, 77, 78.

[113] *Id.* at ¶¶ 54, 79.

[114] The predicted market shares were adjusted for volume differences across products via usage volume information collected from respondents. *Id.* at ¶¶ 55, 80.

A final adjustment was made to account for the fact that, in the real world, the products included in the surveys' store shelves received different amounts of promotion and distribution—two key determinants of market share—whereas, in the surveys, all products are presented on a level playing field.[115] Though this level playing field is necessary to avoid steering respondents towards particular products, adjusting for differences in distribution and promotion is necessary to produce accurate predictions of products' market shares. Many methods have been proposed for this adjustment in the academic and practitioner literature; the expert used the "Aggregate Share Adjustment" method.[116] This method assumes that supply-side factors like promotion and distribution affect each product's market share by amplifying or damping the product's playing-field potential by the same factor.[117] The expert used the products' actual market shares during the period at issue to derive the Aggregate Share Adjustment factor and scale products' predicted market shares.[118]

Comparing the adjusted predicted market shares of the two versions of each Product at Issue, one with the Image at Issue and another with the counter-factual image, the expert found no statistically significant effects of the Images at Issues. That is, the expert could not rule out that any differences in respondents' demand for the Products at Issue with versus without the Images at Issue was not the product of chance—using standard statistical conventions for making that determination.[119] The expert thus concluded that there were no acceptable statistical grounds for attributing any of the sales and, hence, profits of the Products at Issue to the Images at Issue.

D. Plaintiff's *Daubert* Challenge

Plaintiffs filed a *Daubert* challenge against the design, implementation, and interpretation of the expert's conjoint analysis.[120] Plaintiffs' motion included four

[115] In particular, conjoint analysis assumes that, in the real world, each product included in the survey is available for purchase, occupies the same amount of retail shelf space, and consumers are not exposed to any in-store promotions or advertisements. By restricting each simulated store shelf to only a few products, conjoint analysis also implicitly assumes that consumers are aware of all the products available for purchase. *Id.* at ¶¶ 39, 56, 81.

[116] *See, e.g.,* Bryan Orme & Rich Johnson, *External Effect Adjustments in Conjoint Analysis*, Sawtooth Software Research Paper Series (2006), https://sawtoothsoftware.com/resources/technical-papers/external-effect-adjustments-in-conjoint-analysis.

[117] For the purposes of the expert's assignment, his Aggregate Share Adjustment also assumed that the tilt of the supply-side playing field was not affected by whether the actual Image at Issue or counter-factual image was used on the Product at Issue. *Id.* at ¶ 40.

[118] *Id.* at ¶¶ 40, 61, 66, 86, 92.

[119] Namely, the 95 percent level of statistical significance. An effect that is significant at this level could only be the product of pure chance, at most, 5 out of every 100 times the analysis was repeated. Since the effects the expert estimated were smaller than the minimum required effect for statistical significance at the 95 percent level, he could not rule out that these effects were not the product of chance. *Id.* at ¶¶ 60, 61, 66, 85, 86, 91, 92.

[120] Plaintiff's Motion to Exclude Expert Report of Professor RZ, Annette Navarro, et al., v. The Procter & Gamble Company, No. 1:17-cv-406, Doc. 218 ("*Daubert* Motion"). Plaintiffs also filed *Daubert* motions against other defense experts. Plaintiff's Motion to Exclude Expert Report of SH and Partially Exclude Expert Report of DB, Annette Navarro, et al., v. The Procter & Gamble Company, No. 1:17-cv-406, Doc. 217. Defendants filed *Daubert* motions against three of Plaintiffs' experts. Defendants The Procter & Gamble Company and Walmart Inc.'s *Daubert* Motion to Exclude the Report and Testimony of JS, Annette Navarro, et al., v. The Procter & Gamble Company, No. 1:17-cv-406, Doc. 214; Defendants The Procter & Gamble Company and Walmart Inc.'s *Daubert* Motion to Exclude Testimony of JB, Annette Navarro, et al., v. The Procter & Gamble Company, No. 1:17-cv-406, Doc. 215; Defendants The Procter & Gamble

main critiques.[121]

First, Plaintiffs contended that the expert designed his surveys and conjoint analysis to ensure a null finding on apportionment.[122] Plaintiffs claimed that, in order for the expert's conjoint analysis to find a statistically significant effect of the Images at Issue, the images would have to account for at least 50 percent of survey respondents' demand for the Products at Issue.[123] In other words, according to Plaintiffs, if the Images at Issue accounted for 49 percent of demand of the Products at Issue, the expert's analysis would conclude that no profits were attributable to the alleged infringement. Plaintiffs thus asserted that the expert's analysis "was not calibrated to detect the magnitude of the effect he was tasked with investigating" and hence there was no "fit between the inquiry in the case and the testimony."[124]

Second, Plaintiffs argued that the expert's conjoint analysis was unable to isolate the effect of the Images at Issue on demand for the Products at Issue.[125] In particular, Plaintiffs took issue with the fact that the expert's survey "did not vary the Navarro images as an independent attribute" and "show[ed] the Navarro images with only the Olay products."[126] Plaintiffs claimed that "[t[his exclusivity created a confounding in the surveys between the Navarro images and the Olay products[,]" thus the conjoint analysis was unable to estimate the effect at issue.[127] Plaintiffs urged the Court to strike the expert's conjoint analysis because it "[could] not tell the jury what the respondents thought of the Navarro images."[128]

Third, Plaintiffs protested the expert's Aggregate Share Adjustment, which accounted for differences in supply-side factors that conjoint analysis does not consider and lead to differences in products' market shares.[129] Plaintiffs contended that the Aggregate Share Adjustment was a "statistical sleight of hand," "statistical alchemy," and an "improper manipulation[] of inconvenient survey results" intended to hide any discrepancies between the market shares predicted by the expert's conjoint analysis and the market shares in the real world.[130] Plaintiffs presented these discrepancies as proof that the expert's conjoint analysis was "biased and unreliable" and that he should have "throw[n] his survey in the trash can and start[ed] from scratch."[131]

Fourth, Plaintiffs argued that the expert's decision not to exclude all seemingly irrational or inattentive respondents from his conjoint analysis constituted a "flawed

Company and Walmart Inc.'s *Daubert* Motion to Exclude Testimony of LC, Annette Navarro, et al., v. The Procter & Gamble Company, No. 1:17-cv-406, Doc. 216. None of the above experts conducted a conjoint analysis, hence the above motions fall outside of this article's scope.

[121] Plaintiffs also attempted to exclude the expert's semantic differential question and his coupon surveys. *Daubert* Motion at 21-25. We do not address these aspects of Plaintiffs' *Daubert* motion because they did not stem from the expert's conjoint analysis.

[122] *Daubert* Motion at 3-4, 33-35.

[123] *Id.* at 3.

[124] *Id.* at 33-34.

[125] *Id.* at 17-21.

[126] *Id.* at 17, 19.

[127] *Id.* at 19.

[128] *Id.* at 21.

[129] *Id.* at 4-6, 35-37.

[130] *Id.* at 4-6.

[131] *Id.* at 5, 36.

implementation of his survey."[132] Plaintiffs portrayed as mere "*ipse dixit*" the expert's determination that the second choice task he designed to screen seemingly irrational or inattentive respondents was too demanding.[133] Plaintiffs also critiqued the expert's non-use of the random choice tasks in his surveys, which the conjoint analysis software distributes differently across respondents to maximize the information elicited from the sample, to detect irrationality or inattention.[134] Both decisions by the expert, Plaintiffs claimed, nullified the validity of his conjoint analysis.[135]

E. The Court Rejects Plaintiffs' *Daubert* Challenge

The Court denied Plaintiffs' *Daubert* challenge in its entirety.[136] The Court's opinion on Plaintiffs' motion following the order were presented in part V.D.[137]

First, with regards to the statistical power of the conjoint analysis to detect the effect at the heart of the apportionment exercise, the Court ruled that Plaintiffs' "arguments are not persuasive."[138] The Court rejected Plaintiffs' claim that the methodology "is 'imprecisely calibrated' such that he should have found statistical significance when he did not."[139] The Court noted that,

> as [the expert] explained in his deposition, the allegedly high threshold for demonstrating statistical significance is not part of his survey design. Rather it is simply a function of the data from the surveys. In other words, once [the expert] selected the significance level (here, a level of two standard errors, which is a recognized standard for significance), the actual percentage decrease needed to demonstrate that level of significance turned on the nature of the data in the sample.[140]

Second, the Court ruled that the decision to vary the presence of the Images at Issue only on the Olay products, not all products included in his surveys, did not diminish the admissibility of the conjoint analysis.[141] The Court thus rejected

[132] *Id.* at 6, 30-33.

[133] *Id.* at 30.

[134] *Id.* at 31-33.

[135] Plaintiffs also took issue with the accidental inclusion by the survey vendor of some male respondents in one product survey. This inclusion contradicted the expert's instructions, which had defined the relevant population as female due to the female target demographic of the Product at Issue. *Id.* at 6, 26-27. Similarly, Plaintiffs criticized the accidental inclusion by the survey vendor of some smartphone user-respondents in one product survey. This inclusion contradicted the expert's instructions because best practices for conjoint analysis design require respondents to view all products in a choice set on one screen. *Id.* at 6, 28-30.

[136] *Id.* at 1. In the same opinion, the Court granted in part and denied in part Plaintiffs' motion to exclude Defendants' other two experts and granted in part and denied in part Defendants' motion to exclude one of Plaintiffs' experts. *Id.* at 1.

[137] The Court also ruled that the expert's semantic differential questions and coupon surveys were admissible in whole. *Id.* at 39-42, 50-51. Because these analyses were not part of the expert's conjoint analysis, we do not review the Court's opinion on their admissibility.

[138] *Id.* at 34. The Court further ruled that, "[a]s a general matter, Navarro's objections primarily concern [the expert's] results, not his methodology" and go to the weight, not the admissibility of the testimony. *Id.* at 34.

[139] *Id.* at 34.

[140] *Id.* at 34-35. The Court also noted the role of statistical variance in respondents' choices, an inherent feature of all survey data, in assessing the statistical significance of the effect at issue. *Id.* at 34 n. 3.

[141] *Id.* at 31. The Court further ruled that, "even if Navarro is right that [the expert] failed to sufficiently isolate the

Plaintiffs' contentions that the Images at Issue should have been specified as "independent attributes," and ruled that there was no "confounding" in the conjoint analysis. Echoing deposition testimony,[142] the Court noted that

> the point of the consumer surveys was not to isolate the impact of Navarro's photographs on the sale of these types of products generally, but rather to isolate, to the extent possible, the impact that Navarro's photographs had *on the sale of Olay products*. That is, the counterfactual that [the expert] sought to determine was how Olay's sales would have fared against competitors *without* photographs on the Olay boxes, as opposed to how much P&G had in sales of Olay *with* the photos. In both of those worlds, the competitors' offerings did not (or would not) have displayed Navarro's photographs[.][143]

Third, the Court ruled against Plaintiffs' argument that the Aggregate Share Adjustment was "a 'fudge' factor [the expert] employed to arrive at his preferred result."[144] The Court found that the adjustment "has a basis in accepted statistical practice, and cannot be dismissed as a mere fudge factor."[145]

Fourth, the Court sided against Plaintiffs' assertion that all seemingly irrational and/or inattentive respondents should have been excluded—using the harder of the two attention check tasks that he designed and the sixteen random choice tasks that the software designed.[146] The Court observed that, "Navarro, for her part, claims that [the expert] had no grounds beyond his *ipse dixit* to admit certain 'irrational' consumers. But conversely, Navarro fails to provide evidence or citations to cases that establish why [the expert] was wrong to do so."[147] The Court further noted P&G's response to Plaintiffs' motion, which demonstrates that the expert's decision was not *ipse dixit*; instead, relied on recognized authority in conjoint analysis.[148] The Court thus concluded that "Navarro's objection to the inclusion of these [seemingly irrational and/or inattentive] respondents is not grounds to exclude the survey under *Daubert*."[149]

effect of her photographs, it is not grounds to exclude the survey under *Daubert*." *Id.* at 31.

[142] Expert Deposition, Annette Navarro, et al., v. The Procter & Gamble Company, No. 1:17-cv-406, Doc. 199 at 260:24-261:7.

[143] Annette Navarro, et al., v. The Procter & Gamble Co., No. 1:17-cv-406, Doc. 257 (S.D. Ohio Mar. 8, 2021) ("*Daubert* Opinion") at 30-31 (emphasis original).

[144] *Id.* at 36.

[145] *Id.* at 38; *see also id.* at 39 (noting that "not only is [the expert's] Aggregate Share Adjustment a recognized methodology, but [he] also explains its application in this case. This is a methodology, not a fudge factor.")

[146] *Id.* at 45-50.

[147] *Id.* at 47.

[148] *Id.* at 50.

[149] *Id.* at 50. The Court also denied Plaintiffs' claims on the accidental inclusion by the survey vendor of male respondents in one product survey. *Id.* at 43-45. The Court ruled that "Navarro has not demonstrated that the minimal level of overinclusion at issue here somehow obscured, or obstructed, [the expert's] ability to glean insight into the preferences of 90-plus percent of his survey respondents [that are female]. To the contrary, [the expert] says that he re-ran his analysis without men and found that their inclusion did not bias the survey results. In sum, [the expert's] … survey is, at most, slightly overbroad." *Id.* at 45 (internal citations omitted). Similarly, the Court denied Plaintiffs' objections stemming from the accidental inclusion by the survey vendor of some smartphone user-respondents in one product survey. *Id.* at 46-47. The Court noted that "[n]either party presented any evidence … as to whether smart-phone users are inappropriate respondents." *Id.* at 47.

Conclusion

Recognizing that conjoint analysis has become increasingly common in a variety of litigation, this article: 1) provided a primer on the design and implementation of a conjoint analysis and the interpretation of those results; 2) summarized a set of recent high-profile litigation matters employing this technique and drew some inferences from these matters; and finally 3) provided a detailed review of a recent case, *Navarro v. Procter & Gamble*, which withstood a vigorous *Daubert* challenge. The objective of this article was to provide the reader with a comprehensive overview of the current state of the art in the use of conjoint analysis in litigation.

We draw three principal conclusions in this article. First, as demonstrated in our summary of numerous recent matters involving conjoint analysis, the technique's scope is expanding over time to include additional areas of expert testimony. Indeed, as our review of *Navarro* showed, conjoint analysis recently became the central area of expert testimony—for the first time—in a copyright infringement matter. Second, our summary of recent cases illustrated the increasing bar that courts are setting for acceptance of conjoint analysis. Again, *Navarro* supports that thesis, as the conjoint analysis in that matter was thoroughly critiqued in a *Daubert* challenge with the Court issuing a detailed opinion. Finally, several of the recent cases we reviewed showcase the importance of careful consideration of facts allowing for the use of conjoint analysis and the careful attention to its design and implementation needed. Once again, *Navarro* underlines this observation, as the Court's opinion denying the *Daubert* challenge reveals the high returns that a rigorously designed and executed conjoint analysis can generate.