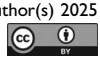
Research Article

Exploring Film as Popular Art Promoting Scarred Villain Trope

Empirical Studies of the Arts
1–26



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Connor S. Wagner[1], Mariola Paruzel-Czachura[2,3,4,5], Clifford I. Workman[6], Satvika L. Kumar[1], Lauren K. Salinero[1], Carlos E. Barrero[1], Matthew E. Pontell[1], Jesse A. Taylor[1], and Anjan Chatterjee[2,3,4]

Abstract

Cinema is a powerful art form that shapes social norms. One enduring trope is the "scarred villain," where facial differences signify moral corruption. Recent advocacy has challenged this stereotype, suggesting a shift in how anomalies are portrayed. To assess trends, we analyzed top-grossing films over four decades in the U.S. and two in India. While the number of villains with facial differences remained stable, heroes with such features increased. Country of origin did not predict the presence of facial anomalies in either heroes or villains. These features were most common in action and fantasy genres. Villains' facial differences tended to be larger and more visually prominent than those of heroes. Men were more often depicted with facial anomalies than women. We also explored whether mature-rated films were more likely to include such portrayals but found no evidence. Our findings emphasize cinema's role in reinforcing stereotypes and call for critical reflection.

[1]Division of Plastic, Reconstructive, and Oral Surgery, Children's Hospital of Philadelphia, Philadelphia, PA, USA
[2]Penn Center for Neuroaesthetics, Perelman School of Medicine, University of Pennsylvania, Philadelphia, PA, USA
[3]Department of Neurology, Perelman School of Medicine, University of Pennsylvania, Philadelphia, PA, USA
[4]Penn Brain Science Center, University of Pennsylvania, Philadelphia, PA, USA
[5]Institute of Psychology, University of Silesia in Katowice, Katowice, Poland
[6]Department of Psychological and Brain Sciences, University of Delaware, Delaware, DE, USA

Corresponding Author:
Mariola Paruzel-Czachura, University of Pennsylvania, 3710 Hamilton Walk, Goddard Laboratories, room 332, Philadelphia, PA 19104, USA; University of Silesia in Katowice, Institute of Psychology, Grazynskiego 53, room 242, 40-126 Katowice, Poland.
Email: mariola.paruzel-czachura@us.edu.pl

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"You look nervous. It's the scars, isn't it?"

– The Joker in the 2008 film, *The Dark Knight* (Nolan & Nolan, 2008)

How do filmmakers convince audiences that clowns are evil, even those rare viewers who actually like clowns? In The Dark Knight (2008), the writing team addressed this challenge by giving the Joker a disturbing, disfigured appearance: "sweaty clown makeup [that obscures] the awful scars which widen his mouth into a permanent, ghoulish smile" (Nolan & Nolan, 2008). This creative decision reflects a longstanding cinematic tradition in which visible facial differences—such as scars—serve as visual cues of moral corruption. Empirical research supports this trend: villains in popular films are significantly more likely than heroes to exhibit facial anomalies (Croley et al., 2017). Given that film is not only a source of entertainment but also a powerful cultural force, advocacy groups have begun to challenge the ethical implications of these portrayals. Notably, in 2018, the UK-based charity "Changing Faces" convinced the British Film Institute to stop funding films that depict villains with facial scars.

But have such advocacy efforts contributed to broader cultural change? Has the visual association between facial difference and villainy diminished in recent cinema? Some early evidence suggested that it might have. For instance, an analysis by Ishida et al. (2018) observed that twenty-first-century films featured fewer villains with dermatologic anomalies compared to those from the twentieth century. This observation was interpreted as progress toward dismantling the scarred villain trope. Yet the question remains whether these patterns hold when systematically analyzed across countries, decades, genres, and character types. The present research was designed to address that question directly.

Wired for Disgust?

Maybe filmmakers intuit a deep-seated feature of human psychology—namely, that visible facial differences like scars, palsies, or burns can trigger an evolved psychological mechanism designed for pathogen avoidance (Paruzel-Czachura et al., 2025). From an evolutionary perspective, humans developed a heightened sensitivity to physical irregularities that might signal disease (Shanmugarajah et al., 2012; Tybur et al., 2009). Although many facial differences are not contagious, they may still activate this ancient reflexive system, eliciting feelings of disgust and avoidance (Workman et al., 2021, 2022). Critically, this emotional reaction can carry unintended moral implications. Research suggests that when people experience disgust, they are more

likely to make harsh moral judgments, perceiving others as less trustworthy, less competent, and more immoral (Ryan et al., 2012). Thus, facial differences may unjustly evoke moral suspicion—not because of a true link to character, but because of a psychological heuristic rooted in our evolutionary past.

Consistent with this evolutionary perspective, studies show that visible facial differences elicit disgust responses that scale with individual levels of trait disgust sensitivity (Shanmugarajah et al., 2012) and resemble the affective responses typically evoked by pathogen-related cues (Ryan et al., 2012). However, an alternative explanation is that filmmakers are not merely responding to evolved biases but are instead perpetuating a culturally learned association—one that equates facial differences with moral deviance because of their longstanding use in villain portrayals. Supporting this view, recent research found that members of a remote hunter-gatherer tribe with minimal exposure to media did not attribute negative moral qualities to faces with scars (Workman et al., 2022). This finding suggests that the link between facial differences and perceived moral character is not universal, but might be culturally constructed. Furthermore, intervention research demonstrates the malleability of these biases: a recent study showed that simply exposing American participants to anomalous faces paired with morally positive narratives effectively reduced implicit negative associations (Bilici et al., 2022). Since people have limited opportunities to form impressions about people with facial differences in daily life, negative representations of facial differences in popular media may fill this knowledge gap in a perniciously disproportionate way.

Faces as Moral Signals

People who are considered attractive benefit from positive assumptions about social desirability, happiness, and trustworthiness—the "beauty-is-good" stereotype (Dion et al., 1972; Todorov et al., 2009). Because faces with visible differences are often rated as less attractive—and lower attractiveness is linked to disadvantages such as social exclusion and hiring discrimination (Baert & Decuypere, 2014; Cui et al., 2019; Desrumaux et al., 2009; Fruhen et al., 2015; Klebl et al., 2022)—most research associates facial anomalies with less favorable character (e.g., Hartung et al., 2019; Houston & Bull, 1994; Jamrozik et al., 2019; Paruzel-Czachura et al., 2024; Workman et al., 2021). Further support for the "anomalous-is-bad" stereotype comes from studies showing that people with facial anomalies are rated more positively following reconstructive surgery (Mazzaferro et al., 2017; Villavisanis et al., 2022; Vu et al., 2020).

At the same time, the literature does not report uniform results. For warmth-related impressions (friendliness, trustworthiness), findings are mixed: one study reported higher warmth for faces with visible differences relative to the same targets shown without disfigurement, alongside lower ratings on status/strength-adjacent dimensions such as social potency and emotional strength (Stone & Wright, 2012). Brief narrative exposure can further improve evaluations relative to photo controls (Stone & Fisher, 2020), though such reports do not compare anomalous to typical (non-disfigured)

faces. More broadly, work on physical disability shows mixed social-perception effects (Colella & Bruyère, 2011; Fichten & Amsel, 1986; Nordstrom et al., 1998; Stone & Colella, 1996). There are also boundary conditions: small facial scars may increase men's attractiveness in short-term mating contexts (Burriss et al., 2009). In sum, although most prior studies point toward an "anomalous-is-bad" association, the broader literature suggests domain-specific exceptions across traits, contexts, and evaluations. Negative portrayals of facial differences in popular culture likely reinforce this pattern; understanding its scope and variation requires a systematic analysis of how facial anomalies are represented in film within broader historical and cultural contexts.

The Current Research

We examined characters from the top-grossing films from the last 4 decades using the Internet Movie Database (IMDb; https://www.imdb.com/) to document facial differences among good and evil characters. This study is relevant to understanding how facial differences are represented in movies and to discussions around the social impacts that occur at the intersection of aesthetics and moral psychology. Each visible difference was graded by size and location as measured by the involvement of aesthetic facial subunits (as defined by plastic surgeons).

We preregistered the following hypotheses:

Hypothesis 1. First, we tested the hypothesis that the use of facial differences in villains has changed over time. We predicted that the incidence of facial differences as visual shorthand for moral villainy in film and other media has not changed over time. We predicted that, when recording incidences of facial differences in villains among the IMDb top 50 highest-grossing films for each decade, we would not find differences in the incidence of these depictions between the 1980s, 1990s, 2000s, and 2010s.

Hypothesis 2. Second, we tested the hypothesis that facial differences in films originating from the U.S. and India differ. Just as work with the hunter-gatherers revealed the limited cross-cultural generalizability of the anomalous-is-bad stereotype (Workman et al., 2022), it was possible that film industries outside of the US, like Bollywood, do not rely as heavily on the scarred villain trope. We predicted that the incidence of facial differences varies based on cultural context, and that the use of facial differences in individualist countries would be greater than that in collectivist countries, as facial differences may be used in individualist countries to create distinctions between good and bad. We predicted that when comparing representations in film from the United States, an individualist country, and India, a country that displays horizontal collectivism (Verma & Triandis, 1999), facial differences would be used more frequently in film from the United States.

Hypothesis 3. Because scars tend to be used to signify toughness and experience in men compared to loss of beauty in women (Luhr, 1995), we tested the hypothesis that facial differences are more frequently used in male than female characters. We predicted that across all films analyzed, the odds of a movie having a male with a facial difference would be significantly greater than the odds of having a female with a facial difference.

Hypothesis 4. Fourth, we tested the hypothesis that the location and size of facial differences vary between heroes (morally good) and villains (morally bad) characters. We predicted that because larger facial differences are more likely to draw attention, facial differences in villains will be larger than those in heroes. We predicted that when comparing the characteristics of facial differences in heroes and villains, facial differences in villains would be more likely to cross facial aesthetic subunits, be asymmetric, and be located around the eyes, nose, and mouth.

Hypothesis 5. Lastly, we investigated whether audience maturity ratings influenced the use of facial differences since movies with young audiences (Ryan et al., 2018) might have a disproportionate impact on stereotype formation. We hypothesized that facial differences in film vary based on the audience rating because, as the intended audience matures, antagonist characters may be portrayed as increasingly immoral, and facial differences will be used to convey that moral standing. We predicted more facial differences in movies rated PG-13 and R than in films rated G and PG (MPA rating system).

This study was preregistered: https://doi.org/10.17605/OSF.IO/6MXP2. The data and statistical analyses resulting from the study are publicly accessible: https://osf.io/7kev5.

Method

Study Design

Film Screening and Selection. This study used publicly available data sourced from IMDb (https://www.imdb.com/). For each year from 1980–2019, the 200 highest revenue-earning films (USD) were recorded from Box Office Mojo (https://www.boxofficemojo.com/) along with the domestic box office earnings. Box office revenue was adjusted using the Consumer Price Index Inflation Calculator published by the U.S. Bureau of Labor Statistics and adjusted to 2020 U.S. dollars (https://www.bls.gov/data/inflation_calculator.htm). Films were then grouped by decade (1980–1989, 1990–1999, 2000–2009, 2010–2019) and sorted by inflation-adjusted revenue. The 50 highest-grossing films from each decade were included. Although fully animated films were excluded, films with live actors in addition to animated characters were included.

The same procedure was used to compile a list of the highest-grossing Indian films. The IMDb does not maintain publicly available box office revenue for Indian films before 2000, so all Indian films that were included were released between 2000 and 2019. Specifically, the 50 highest-revenue Indian films from this period were selected. Representative films from each decade and country, along with photos of corresponding villains, are shown in Figure 1.

For each film, we recorded the year of release, inflation-adjusted box office revenue, Motion Picture Association (MPA) rating, IMDb rating, Metacritic rating, Rotten Tomatoes audience rating, and genres. Genres were assigned on the IMDb webpage for each movie, and there was no limit to the number of genres assigned per movie. Genres were coded dichotomously. See Table S1 for a complete list of the U.S. and Indian films included in this study and their corresponding genres.

Character Screening and Selection

Two researchers completed the character screening process. Characters were screened for facial differences through still frames, posters, and trailers available in each movie's photograph and video galleries on the IMDb page. Photographs from promotional events related to the movie were not screened. Facial differences were defined as any of the following: scarring, burns, deep rhytides (wrinkles), warts, focal pigmentation differences, macro/microcephaly, hypertelorism, nasal deformities, and others. Laterality was recorded for each character with a facial difference (unilateral, bilateral), as were the implicated facial subunits (forehead, temple, brow, periorbital, nasal, infraorbital, zygomatic, mandible, chin, upper lip, and/or lower lip) and facial thirds (upper, middle, or lower facial third) (Figure 2) (Fattahi, 2003). Non-human characters were excluded if they lacked these aesthetic subunits. Only characters for whom an actor was listed in the gallery were included. Background actors were excluded. The gender of each character with a facial difference was recorded. The moral standing of each character with a facial difference was determined by reviewing the plot synopsis available on IMDb. Villains were defined as characters who displayed unfairness, betrayal, deceitfulness, or caused chaos or suffering. Heroes were defined as characters who displayed fairness, loyalty, and purity (Gray & Graham, 2018). Discrepant categorizations were resolved by researcher consensus.

Statistical Analyses

Statistical analyses were performed in JASP (ver. 0.16.3). Cohen's Kappa was used to establish inter-rater reliability. Agreement was defined as either the joint determination that a movie did not have any character with a facial difference or that a character in a movie did have a facial difference. Disagreement was defined as one reviewer recording a character as having a facial difference while the other did not.

Movie genres, MPA ratings, box office revenue, and audience ratings were examined with descriptive statistics. Binomial tests determined whether the proportion of

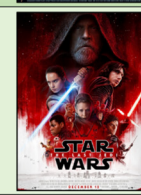
Country of Origin	Box Office Decade	Box Office Year	Representative Movie: Title	Representative Movie: Poster	Representative Movie: Villain
United States	1980 - '89	1986	*Platoon*		
United States	1990 - '99	1991	*101 Dalmatians*		
United States	2000 - '09	2008	*The Dark Knight*		
United States	2010 - '19	2017	*Star Wars Ep. VIII: The Last Jedi*		
India	2000 - '19	2017	*2.0*		

Figure 1. Representative Films, Promotional Posters, and Villains With Facial Differences. *Note*. Each Representative Film Originates from One of the Two Countries (the United States or India) and One of the Four Decades (1980–2019) Examined in the Study. The Rightmost Column Displays Example Villains with Facial Differences from the Respective Films. Movie Posters and Character Images are the Property of their Respective Copyright Holders and are Reproduced Here Under Fair Use Guidelines (https://guides.library.upenn.edu/copyright/fair-use).

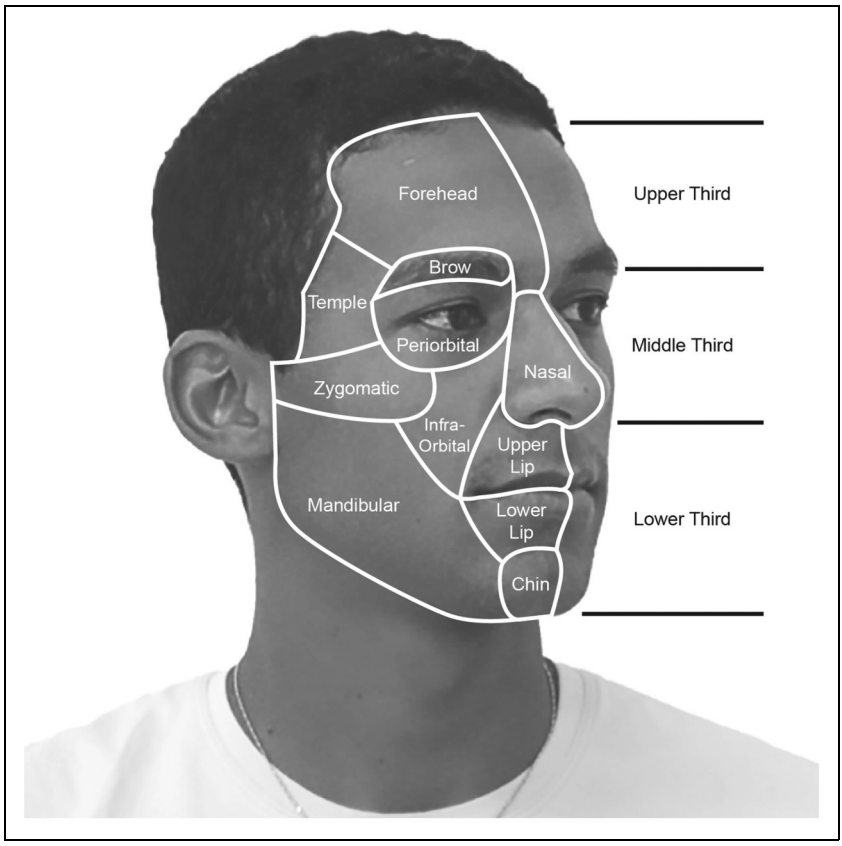


Figure 2. Facial Aesthetic Subunits and Facial Thirds.
Note. Illustration of the Face Segmented into Aesthetic Subunits and Vertical Thirds, Used for Coding the Location of Facial Differences. Figure Adapted from the FEI Face Database (https://web.archive.org/web/20221222211214/https://fei.edu.br/~cet/facedatabase.html).

characters with facial differences differed significantly from the expected in American movies. The expected proportion of male and female characters with facial differences was determined by recording the presenting gender of the first 5 actors listed in the photograph gallery for each of the 200 movies analyzed for 1,000 characters. The proportion of male and female characters in the sample of 1,000 characters served as the reference levels for binomial testing. Chi-square tests: 1. identified univariate associations between the presence of facial differences and film decade of release, genre, audience rating, and country of origin, and 2. compared the proportion of facial differences involving each aesthetic subunit and facial third, as well as the proportion of unilateral versus bilateral differences, among heroes relative to villains. Mann-Whitney *U* tests compared: 1. audience and critic ratings of movies with and without facial differences,

and 2. the number of facial aesthetic subunits covered by the visible differences in heroes relative to villains.

Multivariate logistic regressions were used to: 1. test the effect of decade of release on the presence of at least one character with a facial difference in a movie, 2. predict the presence of at least one character with a facial difference incorporating country of origin, decade of release, and genre, and 3. assess factors predictive of the presence of a villain with a facial difference. The multivariate models included all variables that significantly predicted the presence of a facial difference at the univariate level. Of note, for comparing movies from the United States and India, the sample of the 50 Indian movies with the highest revenue from 2000–2019 was compared to the 50 highest revenue-generating movies from the United States over the same period. As preregistered, we controlled multiple comparisons using the Benjamini–Hochberg false discovery rate (BH-FDR) procedure (criterion $q \leq .05$), where q denotes the BH FDR-adjusted p.

Results

Descriptive Overview

We analyzed 250 films: 200 from the United States (1980–2019) and 50 from India (2000–2019). In the American sample, the most common genres were action (56%), adventure (55%), and science fiction (34%), while Indian films were predominantly dramas (68%), action (64%), and comedies (52%). American films were more often rated PG-13 (category Parents Strongly Cautioned) (57%) or PG (category Parental Guidance Suggested) (24%), whereas most Indian films lacked MPA ratings. Among all American films (from all decades), 61 movies (31%) featured at least one character with a visible facial difference, totaling 98 characters (61 villains and 37 heroes). From 2000–2019, 48% of the top 50 highest-grossing American movies had at least one character with a facial difference compared to 10% of Indian movies over the same period ($p < .001$). Inter-rater agreement was substantial (Cohen's $\kappa = .78$). Additional descriptive information is presented in Supplementary Materials (Tables S2, S3, Figures S1, S2).

Hypothesis 1: Has the Use of Facial Differences in Villains Changed Over Time?

We predicted that the use of facial differences in villains has remained stable over the decades. When villains were analyzed separately (and our hypothesis focused on villains), the decade was not a significant predictor of villainous facial differences (Table 1, Figure 3). Specifically, 10% of films from the 1980s featured a villain with a facial difference compared to 32% in the 2010s ($p = .041$, univariate). However, in a multivariate model accounting for genre, the decade was not significant (OR = 2.3, 95% CI = 0.7–7.7, $p = .162$). Instead, genre was a stronger predictor: action (OR = 3.0, $p = .032$) and fantasy (OR = 3.3, $p = .005$) films were likelier than other

Table 1. Prevalence of Villains With Facial Differences by Genre of American Films.

	OR	95% CI	*p*
Genre			
Action	2.98	1.10 ± 8.09	.032
Drama	.43	.14 ± 1.29	.131
Fantasy	3.27	1.42 ± 7.49	.005
Sci-Fi	.97	.38 ± 2.48	.947
Decade			
1980–1989	—	Ref	—
1990–1999	1.81	.51 ± 6.40	.356
2000–2009	1.46	.43 ± 4.97	.543
2010–2019	2.34	.71 ± 7.66	.162

Note. A multivariate logistic regression predicted the presence of at least one villain with a facial difference as a function of film genre. CI = confidence interval; OR = odds ratio; Ref = reference category.

Table 2. Prevalence of Facial Differences by Genre of American Films and Decade.

	OR	95% CI	*p*
Genre			
Action	2.81	1.09 ± 7.22	**.032**
Drama	.33	.12 ± .91	**.032**
Fantasy	1.63	.72 ± 3.71	.243
Sci-Fi	.75	.29 ± 1.93	.544
Romance	.46	.11 ± 1.96	.293
Thriller	.16	.05 ± .55	**.004**
Decade			
1980–1989	—	Ref	—
1990–1999	2.20	.70 ± 6.96	.178
2000–2009	2.11	.70 ± 6.34	.183
2010–2019	5.63	1.88 ± 16.80	**.002**

Note. A multivariate logistic regression predicted the presence of at least one facial difference as a function of genre and decade of American films. CI = confidence interval; OR = odds ratio; Ref = reference category.

genres to feature villains with facial differences. In sum, the incidence of facial differences among villains has increased descriptively, but the time period was not a statistically significant predictor in multivariate analysis. Thus, our hypothesis was supported.

Additionally, we conducted an analysis for both villains and heroes. A multivariable logistic regression tested predictors of the presence of facial differences across all characters. Period (decade) significantly predicted the overall presence of facial differences: from 14% in the 1980s to 56% in the 2010s ($p < .001$) (Table 2).

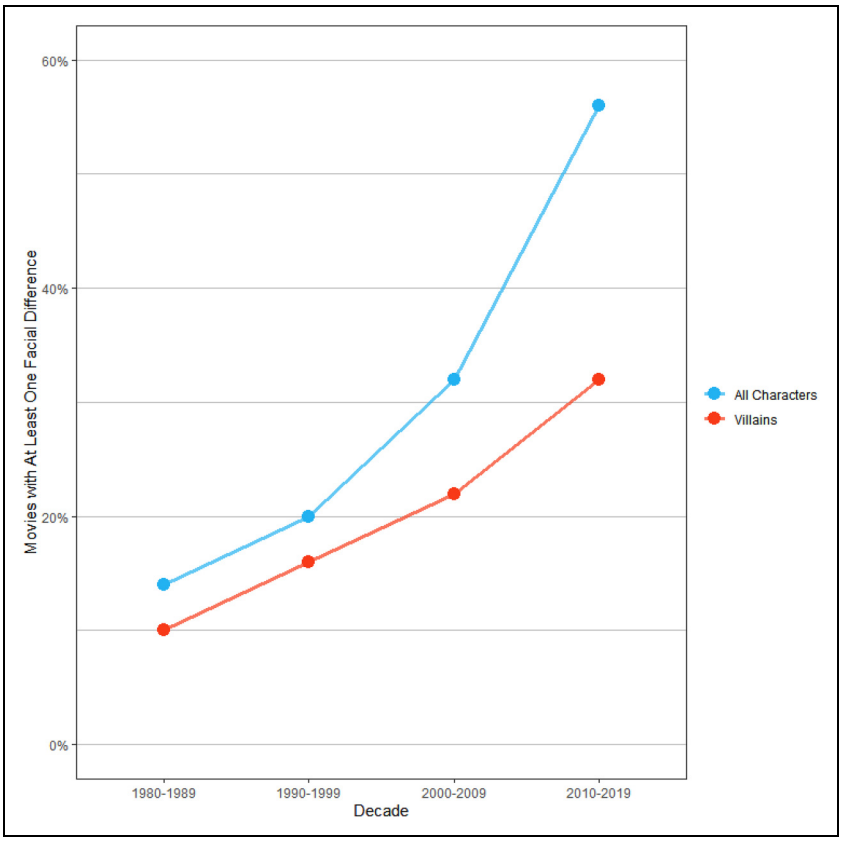


Figure 3. Prevalence of All Characters (Both Heroes and Villains) and Only Villains With Facial Differences by Decade in U.S. Films.
Note. Bars Represent the Proportion of Movies with at Least One Character (Blue) or Villain (Red) with a Facial Difference Across the Four Decades Studied.

Hypothesis 2: Do US Films Feature More Facial Differences Than Indian Films?

We predicted that facial differences would appear more frequently in films from the United States than in those from India. Although 48% of top-grossing US films (2000–2019) featured at least one facial difference compared to 10% of Indian films ($p < .001$), this difference was not significant when accounting for genre.

In a multivariable logistic regression including only genres that differed between countries, country of origin did not significantly predict the presence of facial differences (OR = 1.9, 95% CI = 0.3–12.2, $p = .499$). Instead, the science fiction genre—almost absent in Indian films—was the only significant predictor (OR = 6.9, 95% CI = 1.1–43.9, $p = .040$). In sum, while facial differences were descriptively more

Table 3. Genre Categorizations of the Top-Grossing American and Indian Movies.

Genre	Indian Top 50	American Top 50	*p*
Action	32	40	.075
Adventure	**5**	**43**	**<.001**
Comedy	**26**	**4**	**<.001**
Crime	**11**	**3**	**.021**
Drama	**34**	**10**	**<.001**
Family	2	6	.140
Fantasy	**0**	**17**	**<.001**
History	2	0	.153
Horror	1	0	.315
Mystery	1	3	.307
Romance	6	3	.295
Sci-Fi	**1**	**33**	**<.001**
Sport	3	0	.079
Thriller	5	7	.538

Table 4. Prevalence of Villains With Facial Differences in U.S. Versus Indian Films.

	OR	95% CI	*p*
Country			
India	—	Ref	—
U.S.	1.90	.30 ± 12.25	.499
Genre			
Adventure	.47	.05 ± 4.11	.494
Drama	.30	.06 ± 1.42	.129
Fantasy	2.54	.43 ± 15.09	.307
Sci-Fi	**6.91**	**1.09 ± 43.85**	**.040**
Comedy	.48	.12 ± 2.03	.321

Note. A multivariate logistic regression predicted the presence of at least one villain with a facial difference in American relative to Indian films. CI = confidence interval; OR = odds ratio; Ref = reference category; U.S. = United States.

common in U.S. films, this was accounted for by differences in genre popularity, not cultural context per se Tables 3 and 4.

Hypothesis 3: Are Facial Differences More Common in Male Characters?

We predicted that facial differences would occur more frequently in male than female characters. Of 103 characters with facial differences, 89 (86%) were male and 14 (14%) were female. This difference was significant (binomial test, $p < .001$). However, since characters in top-grossing films are overwhelmingly male, we also examined base rates.

Among a reference sample of 1,000 characters (first five actors listed per movie), 71.7% were male and 28.3% female. Even after adjusting for base rates, males were

overrepresented among characters with facial differences ($p < .001$). The hypothesis was confirmed—facial differences were significantly more common in male than female characters.

Hypothesis 4: Are Villains' Facial Differences Larger and More Noticeable?

We predicted that villains' facial differences would be larger and more visually salient than those of heroes. This was supported. Villains had facial differences spanning more facial subunits ($M = 5.9$, $SD = 5.5$) than heroes ($M = 3.2$, $SD = 4.6$, $p < .001$), and these differences also involved more facial thirds (villains: $M = 1.9$, $SD = 0.8$; heroes: $M = 1.4$, $SD = 0.7$, $p = .001$). Additionally, villains were more likely to exhibit bilateral differences compared to heroes (53% vs. 27%, $p = .014$) and had anomalies affecting the infraorbital region, lips, chin, and mandible (see BH-adjusted q values in Figure 4). A spatial summary of these locations is shown in Figure 5. In sum, villains' facial differences were significantly larger, more centrally located, and more symmetrical—consistent with their intended moral framing. There were no differences in the proportion of heroes and villains who had each type of facial difference; for linear scars, we observed a larger proportion of scars in heroes compared to villains (76% vs. 56%, $p = .047$), but this did not survive BH-FDR correction ($q \leq .05$) (Figure 6).

Hypothesis 5: Are Facial Differences More Common in Films Rated for Older Audiences?

We predicted that facial differences would be more prevalent in films rated PG-13 (Parents Strongly Cautioned) or R (Restricted) compared to G (General Audiences) or PG (Parental Guidance Suggested). In univariate analyses, facial differences were found in 37% of PG-13, 23% of PG, and 18% of R-rated American films, but the difference was not significant ($p = .052$). Only one G-rated movie was identified and was therefore excluded from statistical analysis. Also, MPA rating did not significantly predict facial differences in the multivariable model used for Hypothesis 1. In sum, we observed no differences, and this hypothesis was not supported.

Exploratory Analyses

Movies featuring facial differences had significantly higher box office revenues ($M = \$343$ M, $SD = \$179$ M) than those without ($M = \$231$ M, $SD = \$108$ M, $p < .001$). Additionally, IMDb ratings were slightly higher for films with facial differences ($M = 7.4$ vs. 7.1, $p = .050$), though no significant differences were found in Metacritic or Rotten Tomatoes scores.

Discussion

In this study, we investigated how facial differences are used in popular films to convey moral status and whether such portrayals have shifted over time, across cultures,

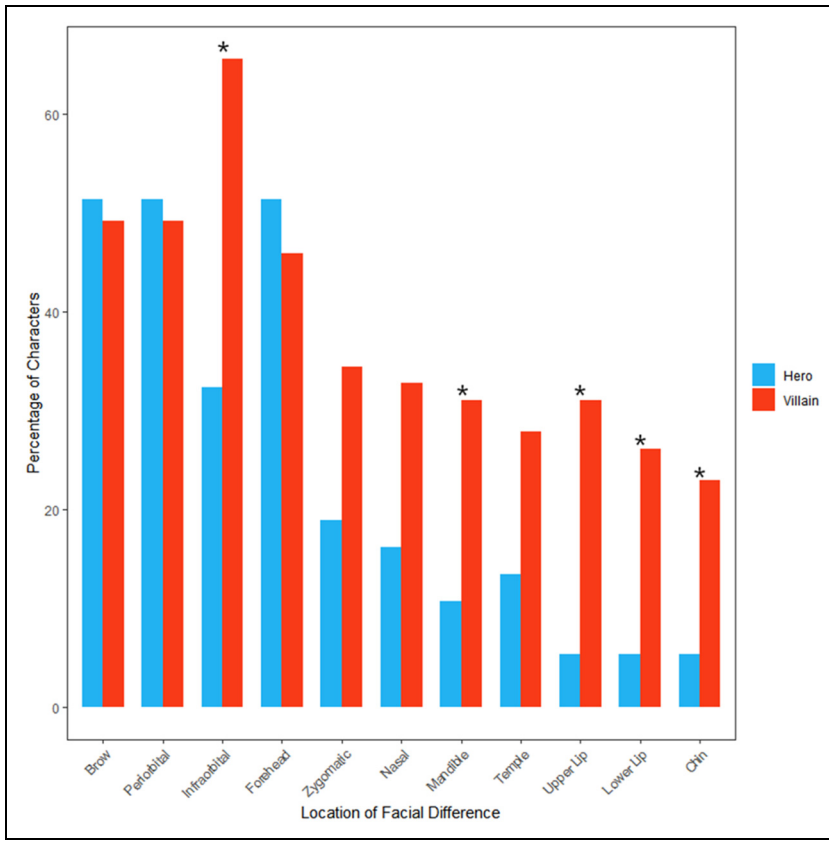


Figure 4. Percentages of Heroes and Villains With Facial Differences by Affected Facial Subunits.

Note. Proportions Represent the Percentage of Characters (Classified as Either Heroes or Villains) Whose Visible Facial Differences Occurred in Each Facial Subunit. Asterisks Mark Subunits that Remain Significant After BH-FDR Correction within the 11-test Family ($q \leq .05$): Infraorbital ($p = .001$; $q = .016$), Upper Lip ($p = .007$; $q = .036$), Lower Lip ($p = .010$; $q = .036$), Mandible ($p = .023$; $q = .050$), Chin ($p = .023$; $q = .050$).

genres, and character characteristics. We addressed five hypotheses, which we now discuss each in turn based on the findings.

Hypothesis 1

Our first prediction proposed that the use of facial differences in villains would remain stable across decades. This prediction was supported. Although there was a descriptive increase in the proportion of villains with facial anomalies over time, the decade of

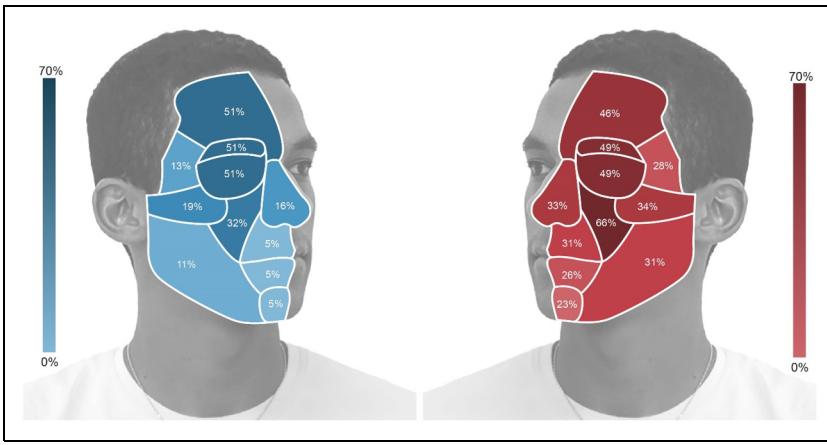


Figure 5. Visual Representation of Facial Difference Locations in Heroes Versus Villains. *Note.* Figure adapted from the FEI Face Database (permalink: https://web.archive.org/web/20221222211214/https://fei.edu.br/~cet/facedatabase.html).

release was not a statistically significant predictor when genre was considered. Instead, action and fantasy films—genres that have become increasingly dominant—were significantly more likely to feature villains with facial differences. This suggests that the continued prevalence of the scarred villain trope is better explained by genre conventions than by temporal trends, indicating the resilience of this visual shorthand in certain types of storytelling.

Although we predicted that the use of facial differences in villains would remain stable over time, it is important to consider whether the analysis was sufficiently powered to detect changes if they existed. A post hoc sensitivity analysis using G*Power 3.1 indicated that with an alpha of .05, and 80% power, the logistic regression model was sensitive to odds ratios of 1.92 or larger (or ≤ 0.52), assuming a base rate of 25% and accounting for genre ($R^2 = 0.10$). Therefore, although the observed odds ratio (OR = 2.34) was in the direction of increased facial differences over time, the result did not reach significance, and the null finding should be interpreted cautiously. While the analysis was sufficiently powered to detect moderate to large changes, smaller effects may have gone undetected.

Beyond villains alone, we also examined how facial differences were distributed across all central characters with anomalies, including both villains and heroes. The analysis revealed a marked increase in the overall presence of facial differences in American films over time. While this trend may appear to reinforce a stereotype, it might also reflect deeper shifts in audience expectations and aesthetic strategies within the film industry. According to Colin Martindale's theory of artistic evolution, creative media tends to evolve toward greater complexity and arousal in response to audience habituation. From this perspective, the increasing use of facial anomalies may serve as

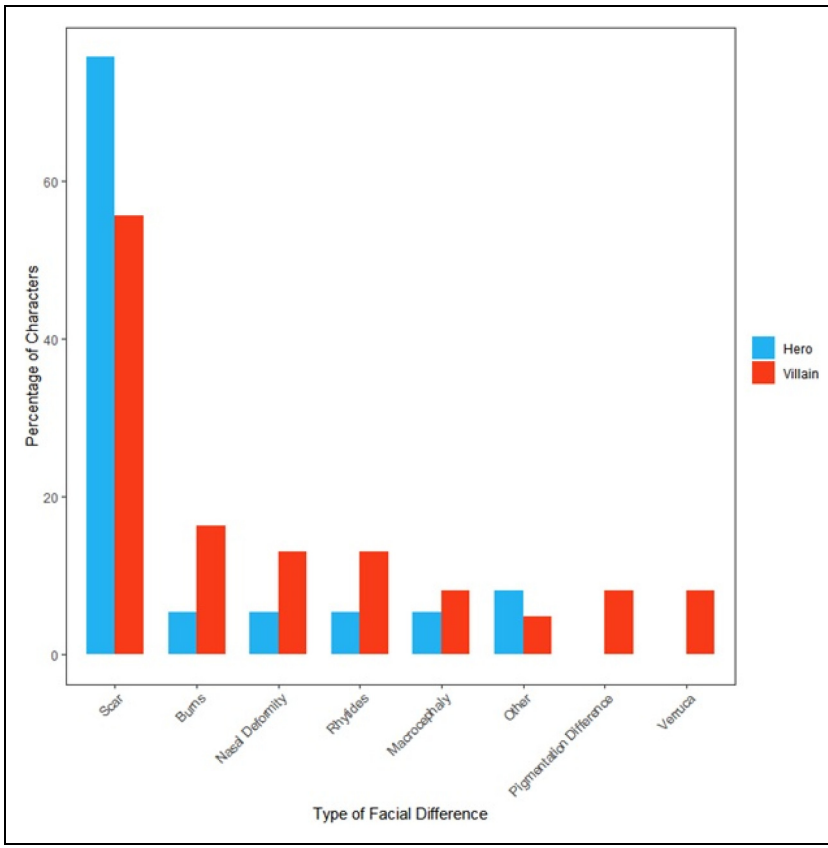


Figure 6. Prevalence of Heroes and Villains With Different Kinds of Facial Differences.

a tool to heighten visual interest and emotional engagement. As viewers are exposed to more media content, filmmakers may turn to more intense or distinctive character features—such as visible differences—to recapture attention and differentiate their narratives. Facial differences, then, might not only function as shorthand for deviance or danger, but also as elements of artistic novelty that resonate with broader patterns in media evolution. This interpretation invites further research into the dynamic interplay between stereotype, storytelling, and audience psychology over time.

Hypothesis 2

The second prediction stated that facial differences would be more common in films produced in the United States than in those from India, based on the assumption that individualist cultures might be more inclined to emphasize moral distinctions visually. While this was descriptively true—facial anomalies were more frequently observed in

U.S. films than in Indian films from the same period—the difference was not statistically significant in multivariate models that accounted for genre. In particular, the science fiction genre, which was almost absent in the Indian film sample, emerged as the strongest predictor of the presence of facial differences. Thus, this prediction was not supported, and our findings suggest that genre plays a central role than national or cultural origin in shaping the use of facial differences in film characters.

At the same time, this lack of statistical significance should not be interpreted as evidence of cultural uniformity. Prior research indicates that some responses to facial differences appear broadly consistent across societies (Bull & David, 1986), while other studies emphasize the role of culturally specific stigmas. For example, in India, facial disfigurement is often shaped by the unique context of fire and acid attacks, which carry distinct symbolic and social meanings (Furr, 2014). Moreover, other visual cues not examined here—such as skin tone—have been shown to vary in their moral and social connotations across cultures and cinematic traditions (Ahuja et al., 2016; Coard et al., 2001; Jha & Adelman, 2009). Future research could build on these insights by examining additional visual signifiers of moral status and including a wider range of cultural contexts and genres.

Hypothesis 3

Next, we predicted that facial differences would be more prevalent in male than female characters. This prediction was confirmed. Even after adjusting for the greater representation of male characters in the sample, facial anomalies were disproportionately assigned to male characters. This aligns with broader cultural patterns in which men are more often depicted as physically marked, potentially to convey toughness, danger, or deviance, while women are rarely portrayed with visible disfigurements. This tendency may reflect enduring beauty norms or an implicit discomfort with disrupting conventional portrayals of femininity. Previous analyses of popular media, such as research on the James Bond franchise, similarly found that characters with facial anomalies were overwhelmingly male (Chen et al., 2022). Moreover, gender has been shown to influence both the perception and psychosocial impact of facial differences. For instance, observers tend to perceive identical facial disfigurements as more severe when presented on women than on men (Lockhart, 1999), and clinical research suggests that women who undergo disfiguring oncologic procedures report higher rates of depression and reduced quality of life compared to men (Katz et al., 2003). These findings point to a gendered asymmetry in how facial anomalies are socially interpreted and experienced—one that may contribute to the limited on-screen representation of visibly disfigured female characters (Hartung et al., 2019). Our results extend this work by showing that these patterns persist across a broader contemporary and international cinema sample.

Hypothesis 4

The fourth hypothesis focused on the size and salience of facial differences in villains compared to heroes. We predicted that villains' facial anomalies would be more

visually salient, and the results supported this expectation. Villains' anomalies spanned more aesthetic facial subunits and facial thirds, were more likely to be bilateral, and appeared more frequently in attention-grabbing areas such as the infraorbital region, lips, chin, and mandible. These features suggest that filmmakers do not rely solely on the presence of a facial difference to signal moral corruption; rather, they amplify its psychological impact through deliberate manipulation of size, symmetry, and placement.

Our findings align with recent research, showing that the visual properties of facial differences influence social perception. Zapatero et al. (2022) found that well-healed scars on the forehead were perceived as friendly and confident, while vertical scars below the eye—especially in the infraorbital region—were evaluated more negatively. This distinction mirrors our data: heroes were more likely to have subtle, linear anomalies located in less prominent areas like the forehead, whereas villains' anomalies were disproportionately concentrated in regions associated with negative social judgments. This pattern likely reflects and reinforces culturally shaped intuitions. The forehead, associated with heroism in both our findings and the public's evaluations, seems to carry less social stigma, while scarring in the lower face intensifies perceptions of threat or deviance.

Importantly, this visual strategy may exploit well-documented gaze patterns. The most visually salient parts of the face—the eyes, nose, and mouth—are all located in the middle and lower thirds (Bindemann et al., 2009; Henderson et al., 2005; Walker-Smith et al., 1977), and villains' anomalies were most often situated in these very regions. Moreover, past work on craniofacial differences suggests that moderate facial anomalies pose particular challenges for psychosocial adjustment, precisely because of inconsistent social responses from others (Moss, 2005). Extending this insight, we find that villainous faces in film tend to display moderate-level anomalies—noticeable but not extreme—that span, on average, two more aesthetic subunits than heroic faces. Such portrayals may reinforce the subtle but damaging social penalties already experienced by people with moderate facial differences, amplifying stigma through visual storytelling.

Hypothesis 5

Our final prediction proposed that facial differences would be more common in films rated for older audiences, based on the assumption that moral complexity—and thus the visual coding of deviance—might increase with audience maturity. This prediction was not supported. While there were descriptive differences across rating categories, audience maturity did not significantly predict the presence of facial anomalies in multivariate analyses. This suggests that the scarred villain trope persists across media intended for both youth and adult audiences, highlighting its broad cultural entrenchment.

This finding is particularly relevant given the increasing exposure of younger generations to digital media. Research shows that fictional narratives can shape

misrepresentations of gender, race, and other social categories, especially during adolescence, a critical period for identity development and moral learning (Christakis & Moreno, 2009; Dill-Shackleford et al., 2017). While some stories promote inclusion and empowerment, for example, narratives featuring relatable moral exemplars are more effective in encouraging altruistic behavior than stories about distant or famous figures (Han et al., 2022), others may reinforce stigmatizing associations. Prior studies found that films like Black Panther foster a sense of identification among marginalized youth, while Harry Potter has been linked to improved attitudes toward stigmatized outgroups (González-Velázquez et al., 2020; Vezzali et al., 2015). However, such gains may be undercut by the continued use of disfigured villains—Harry Potter features a central antagonist with a nasal deformity ranked among the most disfiguring facial anomalies (Dropkin et al., 1983).

Crucially, our results showed that the presence of facial differences in film did not affect critical reception, as measured by aggregated ratings. This suggests that filmmakers gain no evaluative advantage by relying on facial disfigurement to communicate villainy. In light of the potential harm such portrayals may cause—especially for young viewers and individuals with real-life facial differences—abandoning the scarred villain trope may not only be ethically desirable but also creatively inconsequential.

Practical Implications

Taken together, these findings have important implications. First, they suggest that although some progress has been made in diversifying who bears facial differences, e.g., more heroes now display such features, the underlying visual language linking anomaly to immorality remains intact. Rather than abandoning the trope, filmmakers appear to have refined it, using visual details such as the scope and placement of anomalies to signify moral standing. Second, the overrepresentation of male characters with facial differences highlights a gendered asymmetry in how physical deviance is depicted and may reflect deeper societal discomfort with visible disfigurement in women. Third, the absence of a significant cultural difference between U.S. and Indian films, after controlling for genre, suggests that national borders do not bind these visual tropes but may instead reflect shared cinematic traditions and globalized aesthetic sensibilities.

From a practical standpoint, our findings underscore the need for increased awareness among filmmakers, writers, and visual designers about how character aesthetics can perpetuate stigmatizing associations. Although facial anomalies can be used narratively to convey identity or backstory, their repeated pairing with villainy risks reinforcing the "anomalous-is-bad" stereotype, particularly among viewers with limited real-life exposure to individuals with facial differences. As films continue to shape collective understandings of morality and identity, greater care in visual representation could help reduce stigma and promote inclusivity.

Limits and Future Directions

While this study offers important insights, several limits should be acknowledged. First, our analysis focused exclusively on facial anomalies, leaving out other forms of physical or behavioral differences, such as bodily disfigurement, disability, or vocal traits, that may also function as narrative cues for deviance or morality. Future research could explore whether the "anomalous-is-bad" stereotype extends to these other character features.

Second, our cross-cultural comparisons were restricted to the United States and India. Moreover, due to limits in publicly available box office data, our sample of Indian films covered only 2000 to 2019. This temporal constraint may have prevented us from identifying longer-term trends in cross-cultural portrayals of facial differences. Including only two national film industries also limits the generalizability of our conclusions. Expanding the dataset to encompass a broader array of countries and cinematic traditions would allow for more robust testing of cultural variability in using facial difference as a visual trope.

Third, we excluded animated films and background characters from the analysis. While this choice ensured consistent coding of facial subunits and moral status, it also excluded a potentially influential category of media—particularly animated villains (e.g., Scar in The Lion King), which are prevalent in children's films and may contribute significantly to early stereotype formation.

Fourth, we focused on how filmmakers depict facial differences but did not measure how audiences interpret or internalize these portrayals. Understanding the psychological and social consequences of such media exposure—especially among adolescents or individuals with lived experience of facial difference—represents a crucial direction for future work.

Fifth, although we systematically analyzed the presence, location, and visual prominence of facial differences in film characters, we did not code those characters' psychological traits, behaviors, or narrative functions beyond their broad moral categorization (hero vs. villain). As such, we could not examine whether facial differences were linked to specific character traits—such as cruelty, ambition, or redemption arcs—which may differ between villains and heroes. While our moral coding was based on displayed virtues and vices, a deeper narrative-level analysis would be necessary to fully understand how facial differences are used to signify inner character traits or moral development. Future research could benefit from a qualitative or mixed-methods approach investigating how facial differences intersect with storytelling, personality depiction, and audience interpretation.

Lastly, our results suggest that genre—unexpectedly—affects where facial difference appears and how it is used on screen. However,t our study was not designed to study genre in depth. Because we treated genre as a basic label rather than a main focus, we did not balance the sample by genre or test whether genre changes the links between facial difference and morality, character importance, or visual prominence. Future work could use genre-focused designs, sample films within and across genres, describe genre-specific story roles, and test whether the key patterns differ by genre.

Despite these limits, the present study provides a detailed, preregistered analysis of the visual and moral framing of facial differences in film. It lays the groundwork for broader empirical efforts to examine the cultural transmission of aesthetic and moral stereotypes—and for critical reflection on how storytellers can help reduce stigma by portraying facial difference with greater nuance and dignity.

Conclusion

Our study provides a detailed empirical analysis of how facial anomalies are used in film to signal moral character. We found that the scarred villain trope persists. To disrupt this pattern, storytellers could reimagine the meaning of facial difference in narrative contexts. Only then we can move toward a cinematic landscape where physical difference does not automatically connote moral failure.

ORCID iDs

Mariola Paruzel-Czachura https://orcid.org/0000-0002-8716-9778
Clifford I. Workman https://orcid.org/0000-0002-2206-0325
Anjan Chatterjee https://orcid.org/0000-0002-9092-8560

Author Contribution

Connor S. Wagner: Conceptualization (equal); Data curation (lead); Methodology (equal), Writing – original draft (equal); Visualization (lead); Project administration (lead); Formal analysis (lead). Mariola Paruzel-Czachura: Conceptualization (equal); Methodology (supporting); Writing – original draft (equal); Writing – review & editing (lead). Clifford I. Workman: Conceptualization (equal); Data curation (supporting); Methodology (equal), Writing – original draft (equal). Satvika L. Kumar: Supervision (supporting); Resources (supporting). Lauren K. Salinero: Supervision (supporting); Resources (supporting). Carlos E. Barrero: Supervision (supporting); Resources (supporting). Matthew E. Pontell: Supervision (supporting); Resources (supporting). Jessie A. Taylor: Supervision (supporting); Resources (supporting). Anjan Chatterjee: Conceptualization (equal); Funding acquisition (lead); Writing – original draft (supporting); Writing – review & editing (supporting); Methodology (supporting); Supervision (lead); Resources (lead).

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Supplemental material

Supplemental material for this article is available online.

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Author biographies

Connor S. Wagner is a surgical resident researcher. His work focuses on facial differences, media representations, and quantitative analyses of surgical outcomes.

Mariola Paruzel-Czachura is a psychologist who directs the Moral Psychology Center. Her research examines morality as well as aesthetic experience.

Clifford I. Workman is a psychological scientist and cognitive neuroscientist. His research focuses on neuroaesthetics, perception, and social cognition.

Satvika L. Kumar is a researcher in plastic and reconstructive surgery. Her work focuses on craniofacial outcomes and appearance-related quality of life.

Lauren K. Salinero is a clinical research fellow in plastic and reconstructive surgery. Her research focuses on clinical outcomes and patient-reported measures.

Carlos E. Barrero is a clinical research fellow in plastic and reconstructive surgery. His work focuses on craniofacial anomalies and reconstructive outcomes.

Matthew E. Pontell is a pediatric plastic, cleft, and craniofacial surgeon. Research focuses on clinical outcomes, AI/ML applications in CCF surgery, cranial developmental biology, and stem cell engineering.

Jesse A. Taylor is the chief of plastic, reconstructive, and oral surgery at the Children's Hospital of Philadelphia. His research focuses on craniofacial anomalies, surgical outcomes, and appearance.

Anjan Chatterjee is a neurologist and cognitive neuroscientist and the founding director of the Penn Center for Neuroaesthetics. His research focuses on neuroaesthetics.