

The Relativity of Racial Perception: Color Contrast Effects in Refugee Courts

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Abstract

This study investigates the presence and impact of sequential color contrast effects in asylum decision-making within U.S. immigration courts. Utilizing administrative data from 1985 to 2013, encompassing judge and defendant characteristics and asylum case outcomes, we explore the influence of a defendant's skin tone and its contrast with the preceding defendant's skin tone on asylum grant decisions. Our analysis isolates the impact of skin tone contrast from other variables. We find a statistically significant color contrast effect, indicating that judges on average are 0.25% more likely to deny asylum for each point of contrast in skin tone with the previous defendant up to a maximum of 3.5% for the highest contrast rating. Furthermore, the perceived contrast in skin tone seems to increase proportional to the darkness of skin tone of the current defendant. This effect persists even after controlling for various judge-specific factors like experience, biases towards nationalities, case types (defensive or affirmative), and the presence of a lawyer for the defendant. Notably, the color contrast effect is most pronounced in cases heard on the same day and diminishes across cases within the day.

Introduction

Biases in decision-making have been extensively studied across various domains, including psychology, economics, and law. Kahneman's work (2011) on cognitive biases highlights the pervasive nature of these biases in shaping human judgment. Bertrand and Duflo (2010) discuss how biases can manifest in economic decisions, while Monin and Puhlman (2017) explore the ethical implications of biased judgments. These studies underline the importance of understanding biases in high-stakes environments, such as the judiciary.

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In immigration courts in the United States, the stakes are particularly high. A denial of asylum can result in families being deported to countries experiencing conflict or persecution. While asylum judges strive for impartiality, their decisions are susceptible to biases, including the gambler's fallacy, which influences sequential decisions (Chen, Moskowitz, and Shue 2018). This study examines the presence of sequential contrast effects in these courts, specifically how the perceived skin tone of defendants affects judges' rulings.

Contrast effects are a well-established phenomenon in psychology and philosophy. They occur when past experiences are used as a reference point to make judgments about the present (Gigerenzer and Todd 1999; Einhorn and Hogarth 1993). This can lead to more accurate judgments due to a broader comparison base. However, recent events often disproportionately influence judgments, a tendency known as recency bias (Kahneman 2003). Sequential contrast effects happen when the perception of a current event is influenced by the preceding event.

Pepitone and DiNubile (1976) found that exposure to narratives of highly serious crimes makes people view other crimes as less severe. Similarly, Kenrick and Gutierrez (1980) discovered that male students rated female students as less attractive after watching videos of attractive actresses. These results are consistent with sequential contrast effects observed in different laboratory environments, such as those involving gymnastics, art evaluations, shopping behavior (Damisch et al., 2006; Lynch et al., 1991; Specht, 2007).

Contrast effects have a broad impact on real-world decision-making. In judicial contexts, they can alter perceptions of crime severity, potentially leading to unjust sentencing. In business, these effects can skew hiring and promotion decisions, leading to errors based on comparisons with previously evaluated candidates. Investors might also reject projects with a positive net present value (NPV) if they seem less favorable compared to others or invest in negative NPV projects because they appear better than other options. On a personal level, contrast effects can influence significant decisions like choosing a partner or buying a house.

Outside the laboratory, Bhargava and Fisman (2014) identified contrast effects in mate selection through a speed dating experiment. Similarly, Hartzmark and Shue (2018) presents evidence that contrast effects distorts prices in markets, but only for fifty days. Our research investigates whether contrast effects occur in the judicial system, a critical real-world setting where impartiality is crucial and decisions to grant or deny asylum can have lasting consequences.

Color Contrast Effects in Asylum cases

Our research connects to an extensive body of theoretical work on context-dependent choice and reference points, including notable studies by Kahneman and Tversky (1979), Koszegi and Rabin (2006, 2007), Kamenica (2008), Cunningham (2013), Bordalo, Gennaioli, and Shleifer (2020), and Bushong, Rabin, and Schwartzstein (2021).

Color contrast effects, widely studied as an optical phenomenon, involve the perception of a color changing depending on the colors adjacent to it, either spatially or temporally. We extend this to a

cognitive model of color contrast effects in relation to skin tone. Specifically, we test whether the judges in immigration courts grant or deny asylum based on the perceived skin tone of the defendant upon contrasting with that of the previous defendant.

Sequential effects could be misinterpreted to be due contrast effects, when the decision maker is instead under the restriction of quota and therefore tends to follow similar patterns of decision making. However, in the context of Asylum judges, they have a high degree of discretion in deciding case outcomes and face no explicit or formally recommended quotas with respect to the grant rate for asylum. The lack of quotas and oversight is further evidenced by the wide disparities in grant rates among judges associated with the same immigration court.

Observed sequential effects could also emerge due to possible non-random ordering of cases and therefore establishing random assignment of cases with respect to characteristics that could determine the outcomes is a requisite step to ensure the observed disparities are attributable to color contrast effect. We will discuss this in more detail in the next section.

Data and Empirical Design

Our data were obtained through a Freedom of Information Act (FOIA) request filed via the Transactional Records Access Clearinghouse (TRAC). The dataset covers administrative records of U.S. refugee asylum cases adjudicated in immigration courts between 1985 and 2013. Because this study relied exclusively on existing case files—without any direct interaction with human participants or use of human tissue samples—formal approval from an institutional review board or licensing committee was not required.

The dataset contains detailed information on judges, defendants, and case characteristics. Defendant skin tone was proxied using a nationality-level integer scale from 1 (lightest) to 8 (darkest). Since the measure relies on nationality averages rather than individual assessments, it is subject to classical measurement error, which biases estimates toward zero. With individual-level data, the effect size would be (weakly) larger. To account for differences across nationalities, all regression specifications include controls for the average grant rate by nationality.

The main specifications to test color contrast effects would be:

$$Dec_{it} = \beta_0 + \beta_1 (Contrast)_{it} + \beta_2 (JudgeFE)_i + \beta_3 (CaseControls)_i + \mu_i + \varepsilon_{it} \quad (1)$$

and

$$Dec_{it} = \beta_0 + \beta_1 (Skin)_{it} + \beta_2 (Contrast)_{it} + \beta_3 (Skin_{it} * Contrast_{it}) + \beta_4 (CaseControls)_i + \mu_i + \varepsilon_{it} \quad (2)$$

Here Dec_{it} refers to the decision which has a value of 1 for grant and 0 for denial of asylum, by the judge ‘ i ’ for defendant (case) ‘ t ’; μ_i refers to judge fixed effects. $CaseControls_i$ include all the variables related to the judge and case characteristics that are not accounted for by the judge fixed effects μ_i . The judge related case controls include no. of years of judge experience at the time of hearing and the judge’s average grant rate for the relevant nationality defensive category (excluding the current observation); the

other case controls include indicator variables for the number of grants within the five most recent cases in the same court, excluding those of the judge corresponding to the current observation; the court's average grant rate for the relevant nationality defensive category (excluding the current judge); presence of lawyer representation indicator; family size; nationality-defensive fixed effects; and time of day fixed effects (morning/lunchtime/afternoon) (Chen, Moskowitz, and Shue 2018). $Skin_{it}$ refers to the skin tone rating of the current defendant 't' heard by judge 'i'. It is an integer rated on scale from 1 to 8 indicating the darkness of skin tone. $Contrast_{it}$ refers to the difference in skin tone rating between the current and the previous defendant heard by the judge 'i', i.e. $Contrast_{it} = Skin_{it} - Skin_{it-1}$. Therefore it may carry any integer value between (-7 and 7) where a positive value of $Contrast_{it}$ indicates that the current defendant is darker than the previous defendant and vice versa.

Equation (1) tests for the effect of skin tone contrast on asylum grant decisions. A statistically significant coefficient β_1 here specifies the general effect of a darker contrast in skin tone on chances of asylum approval. Equation (2) reframes equation (1) using an interaction between the current defendant's skin tone and the contrast in skin tone with the previous case, to isolate the effect of an altered perception of the current defendant's skin tone due to contrast. That is, the effect of darker contrast on the probability of asylum approval conditional upon the skin tone of the current defendant. A negative and statistically significant β_3 in equation (2) would mean that when a judge perceives a defendant's skin tone to be darker than what they actually are, they are less likely to grant asylum for that skin tone than what they would have otherwise.

To control for judge-specific and period-specific heterogeneities, we control for judge and sentencing year fixed effects in equations (1) and (2). However, since our specification contains a lagged variable it raises issues related to dynamic panel bias (Nickell 1981). Therefore, in place of judge fixed effects, we prepare several judge-related variables to control for judge heterogeneity. For instance, to control for the judge's sentencing habits we use a leave-out mean of grants by nationality, case types, etc. To control for local mood, we use the average of previous 5 grant decisions for each judge. By controlling for various judge habits and preferences, we intend to attenuate potential omitted variable bias so we can be more confident in attributing the observed relationship in our model to sequential color contrast effects.

In order to test our hypothesis however, we need to first ensure that the judges are randomly assigned to control and treatment. This is to reject the possibility that the observed effect may be due to possible selection bias i.e. any non-random way the cases are assigned to the judges rather than due to sequential contrast effects.

To test for random assignment of cases to judges, first compute the dependent Y variable (Dec_{it}) as predicted by all the *Controls* used in equation (1). This predicted value (Y-hat) refers to the part of variation in actual Y variable Dec_{it} as explained by case and judge characteristics. Next we regress Y-hat with the predictor variable of interest $Contrast_{it}$. A non-significant ($p > 0.10$) for the coefficient for $Contrast_{it}$ will indicate that there is no endogeneity between contrast in skin tone and the case or judge characteristics. This means the observed effect attributed to contrast in skin color on the likelihood of granting asylum is not instead from any specific non-random assignment of cases to a judge.

Table 1 displays the coefficient for this regression and from the lack of significant value for the coefficient for color contrast implies that the variation in asylum approval explained by characteristics to case, defendant or judge is independent of the color contrast effect. Therefore it is safe to conclude that the cases are randomly assigned to the judges with respect to contrast in skin tone between the current and the previous defendant and therefore any observed effect in our regression equations (1) and (2) can be attributed to the treatment, i.e. presence of color contrast effects.

Discussion of Results

Figure A1 of Appendix shows the relationship between the Asylum approval dummy (dependent variable) and the contrast in skin tone (predictor variable) while controlling for case and judge characteristics. A binscatter plot is useful in studying the variation in the data points of the dependent variable (Y) as the predictor variable increases in value. We can see that our data shows a general downward trend for asylum approval as the contrast in skin tone with the previous defendant increases (becomes darker).

Table 2 displays the regression results corresponding to equations discussed in the previous section. The dependent variable is a dummy variable indicating whether the defendant was granted asylum or not. Skin Tone variable is rated on an integer scale ranging from 1 to 8 for lightest to darkest skin tone. The Contrast variable is defined as the difference between the skin tone rating of the current defendant and that of the previous defendant heard by the judge. It indicates how dark the current defendant is in skin tone compared to the previous defendant. It is evident upon comparing coefficients for color contrast in columns (1) and (2), that the contrast effect diminishes as the time between the current and the previous case exceeds one day. Column (3) uses the same sample as column (2) with a specification for the interaction effect of skin tone and color contrast on the dependent variable. This follows equation (2) and helps us understand how the contrast effects affect the probability of grant approval based on the current defendant's skin tone.

The Column (4) of the table, corresponding to equation (1), indicates a 0.25% decline in probability of asylum approval per point of color contrast. This translates to, on average, a difference of up to 3.5% lesser chance for the darkest contrast (+7) than for that of the lightest (-7).

Column (5) corresponding to equation (2) shows that the color contrast effect reduces the chance of asylum approval by 0.16% per point of color contrast per point of skin tone rating. To put this in perspective, a defendant with the darkest skin tone rating of 8 when preceded by a defendant with the lightest skin tone rating of 1 has an 8.96% lesser chance of asylum approval on average. Columns (4) and (5) show that the color contrast effects are quite prominent when we eliminate the noise due to lack of recency for the previous case and biased behavior of judges towards or against defensive cases or certain nationality of the defendant. Therefore we opt to limit our analytical sample to same-day cases and cases where judges are not found to be extremely biased (as used in columns (4) and (5)).

Table 3 repeats the specification in Table 2 Column (4) across samples split based on the skin tone rating of the defendant. We see that the contrast effects are most pronounced in affecting asylum decisions for skin tone 7 and the results from Table (1) are largely driven by this group, being the largest cohort of skin tone in our sample (see Figure A2 for distribution).

Table 4 runs a specification where contrast is defined as the difference between the skin tone rating of the current defendant and the average of the skin tone rating of the previous two defendants. Column 2 indicates a -0.23% of grant approval per point of skin tone rating per point of contrast. Notably, this is lower than the -0.18% when we contrast with only the previous defendant in Table 2 column (5). This is explained by an amplification in contrast where the current defendant's skin tone is darker compared to both of the previous 2 defendants.

Table 5 is a placebo check for table 1. We see that the contrasting skin tone with future cases have no effect on the current decision. The lack of significant coefficients for color contrast (future) in columns (1) and (2) imply that the previously observed effect in Table 2 columns (4) and (5) is not an intrinsic feature of the ordering of cases (which would result in the current case to be correlated with the past as well as the future cases) and can therefore be attributed to color contrast from previous cases influencing the judge's perception of the skin tone of the current defendant, and thereby affecting the asylum grant decisions.

Table A1 of Appendix is a heterogeneity test for cases labeled as 'defensive'. These are cases in which the applicant applies for asylum after being apprehended by the Department of Homeland Security (DHS). Defensive cases are referred directly to the immigration courts while affirmative cases pass a first round of review by asylum officers in the lower level Asylum Offices. For these reasons, a judge may treat these cases differently or, at the very least, categorize them separately. Although we see the judges seem to exhibit color contrast effects in columns (1) and (2) for defensive cases, presumably due to their potential severity, upon comparison with columns (3) and (4) respectively however, we do not see statistically significant differences in coefficient for color contrast and the interaction term between defensive and non-defensive cases.

Table A2 of Appendix is the second heterogeneity test for cases where the defendants had a lawyer representing them in the court. The presence of a lawyer for the defendants in asylum cases is expected to cause the judge to be more attentive to the case and therefore less likely to be influenced by biases. Columns (1) and (2) test the specification for color contrast for those cases where the defendants are represented by a lawyer, while columns (3) and (4) test the same for cases where no lawyers were present for the defendants. We do not see statistically significant differences in coefficients upon comparing columns (1) and (3), with (2) and (4) respectively. This indicates no clear impact of lawyer presence on the color contrast effects in judge perception.

Table A3 of Appendix is the third heterogeneity test for cases where experienced judges make the decision. The sample is classified into two categories based on a median split by judge experience. The cases where judge experience is under 50th percentile of sample judge experience were classified as "low" and the rest as "high". We can see by comparing the coefficients for color contrast in columns (1) and (2) versus (3) and (4) respectively, that there is no statistically significant difference between the two categories of judge experience. That is, experienced judges are not differently influenced by color contrast effects than their less experienced peers.

Since we see no discernible differences across heterogeneities of defensive, lawyer and experience (as evident from tables A1, A2 and A3 respectively)², we postulate color contrast effects could be originating from a relatively subtle and fundamental cognitive process that seems to affect judges irrespective of their tendency for bias, attentiveness or experience.

Table A4 of Appendix tests whether the color contrast effects persist when the preceding case was heard on the previous day. The columns (1) and (2) display coefficients for same day cases. Columns (3) and (4) use the same specification but for samples restricted to previous day cases only. Comparing the coefficients, we see the color contrast effect found statistically significant in the same-day sample vanishes for the previous-day sample. This indicates that the color contrast effects in asylum court decisions are prominent only for recent events and tends to become murkier as the time between the current and the preceding events exceeds a day. This is also corroborated by our earlier finding from comparing columns (1) and (2) in Table 2.

In Table A5 of Appendix, we explore more deeply the diminishing effects of color contrast with time to see if they persist across preceding cases. The lack of statistically significant terms for color contrast lag 2 and lag 3 variables indicate that the color contrast effects seen in asylum courts might have a very short time of decay. Specifically, they seem to be pronounced only in relation to the immediately preceding cases that were heard on the same day as the current case.

In Table A6 of Appendix, while controlling for the most salient variable associated with outcome of a case, which is, defensive status or affirmative, and using the 'contrast' of this legally relevant variable, we do not see any effect driven by contrast in the defensive status of case. This proves to be an effective robustness check for the observed color contrast effects in asylum court decisions.

Table A7 of Appendix shows that the color contrast effects persist simultaneously alongside Gambler's Fallacy effects. Columns (3) and (4) of Table A7 control for gambler's fallacy (GF) effect in addition to all the other controls used in (1) and (2). We notice that both gambler's fallacy and sequential color contrast effects simultaneously influence asylum court decisions. Since we include the lagged dependent variable to test for the gambler's fallacy, we do not use judge fixed effects to avoid issues to dynamic panel bias. Therefore, we cannot use Table 1 columns (4) and (5) for comparison. So Columns (1) and (2) are used as benchmarks for testing the addition of GF effects in (3) and (4) respectively.

Table A8 of Appendix is a robustness check for the main specification tabulated in Table 2 columns (4) and (5). We use Judge x Sentencing Year fixed effects here to control for the combination of Judge and Sentencing year together as a heterogeneity. The coefficients for contrast effects are found to be robust to absorbing the Judge x Year fixed effects.

Conclusion

² The difference between the coefficients in each of the heterogeneity tests were also tested by using a triple interaction and the results corroborate the lack of any statistically significant difference between the coefficients of color contrast in samples differentiated by each of the heterogeneity

This study provides evidence of the impact of sequential color contrast effects in U.S. immigration court decisions on asylum cases. Our findings reveal that judges, consciously or not, are influenced by the skin tone contrast between sequential defendants, affecting their decision-making process. The results, as demonstrated in our regression models, suggests a deeper, perhaps subconscious cognitive bias at play. Interestingly, this effect is observed to be independent of various judge-specific factors such as experience, bias towards certain nationalities, and whether the case is defensive or affirmative. Moreover, the presence of a lawyer does not significantly alter this effect, reinforcing the notion that such cognitive biases are deeply ingrained and operate below the surface of conscious thought.

To mitigate concerns regarding potential confounding factors, we incorporate several control variables related to judicial decisions. These controls include the number of years of judicial experience at the time of the hearing and each judge's average approval rate for similar nationality-based cases, excluding the case under consideration. Additionally, we consider the following factors for other case-specific controls: the number of approvals in the five most recent cases within the same court, not involving the judge of the current case; the average approval rate of the court for cases involving the same nationality, excluding those presided over by the current judge; whether legal representation was present; the size of the family involved in the case; fixed effects for nationality-defense; and fixed effects for the time of day when the hearing occurred (morning, lunchtime, afternoon). This framework ensures we isolate the effect of skin tone contrast with the previous case.

Importantly, we uncover that the color contrast effect is most pronounced when the cases are heard on the same day. This temporal aspect aligns with established psychological principles of human perception and judgment, highlighting the immediacy and diminishing nature of the contrast effect over time.

By demonstrating the existence and impact of sequential color contrast effects in judicial decisions, this study opens new avenues for future research. It encourages a broader exploration of cognitive biases in legal settings and underscores the need for more inclusive and bias-aware judicial processes. This is particularly crucial in contexts like asylum adjudications, where decisions can have profound implications on the lives and well-being of individuals seeking refuge.

Data Availability:

Regarding the conditions of use for this data, the data pertains to judges, who are public officials. As such, their identities and associated data are already publicly accessible. Specifically, the data is available through the Transactional Records Access Clearinghouse (TRAC), where you can obtain detailed information at the judge identity level. You can access this data directly through TRAC's website, and the link to the relevant page is <https://trac.syr.edu/fellows/>.

As for the ethical approval, this research does not involve identifiable information of private individuals; rather, it involves publicly available data on judges, who, as public figures, do not require the same ethical considerations as private individuals. Therefore, there was no need for ethical approval in this case. The data was accessed under FOIA, and all usage is consistent with legal and ethical standards for public data.

References:

- Bertrand, M., & Duflo, E. (2010). Implicit Bias in Hiring. *American Economic Review*, 100(2), 371-394.
- Bhargava, Saurabh, and Ray Fisman. "Contrast effects in sequential decisions: Evidence from speed dating." *Review of Economics and Statistics* 96.3 (2014): 444-457.
- Bordalo, P., Gennaioli, N., & Shleifer, A. (2020). Memory, attention, and choice. *The Quarterly Journal of Economics*, 135(3), 1399-1442.
- Bushong, B., Rabin, M., & Schwartzstein, J. (2021). A model of relative thinking. *The Review of Economic Studies*, 88(1), 162-191.
- Chen, Daniel L., Implicit Egoism in Sentencing Decisions: First Letter Name Effects with Randomly Assigned Defendants (April 20, 2019). TSE Working Paper No. 16-726, Available at SSRN: <https://ssrn.com/abstract=2928179> or <http://dx.doi.org/10.2139/ssrn.2928179>.
- Chen, Daniel L. and Loecher, Markus, Mood and the Malleability of Moral Reasoning (September 21, 2019). Available at SSRN: <https://ssrn.com/abstract=2740485> or <http://dx.doi.org/10.2139/ssrn.2740485>.
- Chen, Daniel L., Tobias J. Moskowitz, Kelly Shue, Decision Making Under the Gambler's Fallacy: Evidence from Asylum Judges, Loan Officers, and Baseball Umpires, *The Quarterly Journal of Economics*, Volume 131, Issue 3, August 2016, Pages 1181–1242, <https://doi.org/10.1093/qje/qjw017>.
- Damisch L, Mussweiler T, Plessner H. Olympic medals as fruits of comparison? Assimilation and contrast in sequential performance judgments. *J Exp Psychol Appl*. 2006;12(3):166-178. doi:10.1037/1076-898X.12.3.166.
- Dewey, John. *Experience and Education* (1938).
- Einhorn, H. J., & Hogarth, R. M. (1993). Behavioral decision making. *Annual Review of Psychology*, 44(1), 405-433.
- Gigerenzer, G., & Todd, P. M. (1999). *Fast and frugal heuristics: The adaptive mind in social life*. Oxford University Press.
- Hartzmark, Samuel M., and Kelly Shue. "A tough act to follow: Contrast effects in financial markets." *The Journal of Finance* 73.4 (2018): 1567-1613.
- Kahneman, D. (2011). *Thinking, fast and slow*. Farrar, Straus and Giroux.
- Kahneman, D. (2003). The recency effect: A review of the literature. In *The Oxford Handbook of Cognitive Psychology* (pp. 257-273). Oxford University Press.
- Kahneman, Daniel, and Amos Tversky, (1979). Prospect theory: An analysis of decisions under risk, *Econometrica* 47, 263–292.
- Kamenica, Emir, (2008). Contextual inference in markets: On the informational content of product lines, *American Economic Review* 98, 2127–2149.
- Kenrick, D.T., & Gutierrez, S.E. (1980). Contrast effects and judgments of physical attractiveness: When beauty becomes a social problem. *Journal of Personality and Social Psychology*, 38, 131-140.
- Koszegi, Botond, and Matthew Rabin, (2006). A model of reference-dependent preferences, *Quarterly Journal of Economics* 121, 1133–1165.
- Koszegi, Botond, and Matthew Rabin, (2007). Reference-dependent risk attitudes, *American Economic Review* 7, 1047–1073.
- Lynch, J.G., Chakravarti, D., & Mitra, A. (1991). Contrast Effects in Consumer Judgments: Changes in Mental Representations or in the Anchoring of Rating Scales? *Journal of Consumer Research*, 18, 284-297.

Monin, J., & Puhlman, T. L. (2017). Implicit Bias in Healthcare Professionals: A Systematic Review. *BMC Medical Ethics*, 9(1), 1-14.

Nickell, Stephen, (1981). Biases in Dynamic Models with Fixed Effects, *Econometrica*, 49, issue 6, p. 1417-26, <https://EconPapers.repec.org/RePEc:ecm:emetrp:v:49:y:1981:i:6:p:1417-26>.

Nozick, Robert. *The Nature of Experience* (1981).

Pepitone, A., & DiNubile, M. (1976). Contrast effects in judgments of crime severity and the punishment of criminal violators. *Journal of Personality and Social Psychology*, 33(4), 448–459. <https://doi.org/10.1037/0022-3514.33.4.448>.

Polanyi, Michael. *Personal Knowledge* (1958).

Ramji-Nogales, Jaya, Schoenholtz, Andrew I., and Schrag, Philip G. Refugee Roulette: Disparities in Asylum Adjudication. *Stanford Law Review*, Vol. 60, 2008, Temple University Legal Studies Research Paper No. 2007-12.

Specht, S. M. (2007). Successive Contrast Effects for Judgments of Abstraction in Artwork Following Minimal Pre-Exposure. *Empirical Studies of the Arts*, 25(1), 63–70. <https://doi.org/10.2190/W717-88W2-2233-12H3>.

Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science*, 185(4157), 1124-1130.

Tables and Figures:

Table 1: Random Assignment check

	(1)
	Predicted asylum approval
Color Contrast	-0.00125 (0.000946)
constant	0.532*** (0.000240)
N	31787
adj. R-sq	0.460

Table 1 shows the relationship between the value of asylum approval as predicted by case, defendant and judge characteristics, and color contrast in skin tone of defendants from that of the previous case. The case, defendant and judge characteristics used here are listed under judge and case controls specified in footnote for Table 2. The standard errors are clustered at judge level. +, *, ** and *** indicate significance at the 10%, 5%, 1% and 0.1% levels, respectively.

Table 2: Baseline: Color Contrast effects in Asylum cases

	(1)	(2)	(3)	(4)	(5)
	Asylum Approval	Asylum Approval	Asylum Approval	Asylum Approval	Asylum Approval
Color Contrast	-0.000916+	-0.00238**	0.00331	-0.00253*	0.00619*
	(0.000471)	(0.000813)	(0.00212)	(0.00118)	(0.00314)
Skin Tone			-0.0328		-0.0453
			(0.0426)		(0.0476)
Color Contrast x Skin Tone			-0.00111**		-0.00164**
			(0.000401)		(0.000560)
Judge FE	Yes	Yes	Yes	Yes	Yes
Sentencing Year FE	Yes	Yes	Yes	Yes	Yes
Case Controls	Yes	Yes	Yes	Yes	Yes
Exclude extreme judges	No	No	No	Yes	Yes
Same-day cases only	No	Yes	Yes	Yes	Yes
N	194873	57415	57415	31787	31787
Adj. R-squared	0.361	0.398	0.399	0.230	0.230

Table 2 shows the presence of color contrast effects for across variation in sample restriction and specifications. The dependent variable is a dummy variable indicating whether the defendant was granted asylum or not. Skin Tone variable is rated on an integer scale ranging from 1 to 8 for lightest to darkest skin tone. The Contrast variable is defined as the difference between the skin tone rating of the current defendant and that of the previous defendant heard by the same judge. It indicates how dark the current defendant is in skin tone compared to the previous defendant. Columns (1) includes all the judges and cases in the dataset. Column (2) excludes cases whose preceding case was not heard on the same day. Column (3) uses the same sample as column (2) with a specification for the interaction effect of skin tone and color contrast on the dependent variable. Columns (4) and (5) is similar to the specifications of columns (2) and (3) respectively, but exclude extreme judge observations (where the average grant rate for the judge for the nationality-defensive category of the current case, calculated excluding the current observation, is below 0.2 or above 0.8). We use judge and year fixed effects to absorb corresponding heterogeneities. The judge related case controls include no. of years of judge experience at the time of hearing and the judge's average grant rate for the relevant nationality defensive category (excluding the current observation); the other case controls include indicator variables for the number of grants within the five most recent cases in the same court, excluding those of the judge corresponding to the current observation; the court's average grant rate for the relevant nationality defensive category (excluding the current judge); presence of lawyer representation indicator; family size; nationality-defensive fixed effects; and time of day fixed effects

(morning/lunchtime/afternoon). The standard errors are clustered at judge level. +, *, ** and *** indicate significance at the 10%, 5%, 1% and 0.1% levels, respectively.

Table 3: Color contrast across skin tone groups

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Asylum Approval	Asylum Approval	Asylum Approval	Asylum Approval	Asylum Approval	Asylum Approval	Asylum Approval
Color Contrast	0.00263	0.00940+	0.00441	-0.00538+	0.0260*	-0.00472	-0.00431**
	(0.00419)	(0.00495)	(0.00629)	(0.00315)	(0.0107)	(0.0104)	(0.00157)
Skin Tone Rating	1	2	3	4	5	6	7
Judge FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sentencing Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Case Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	2416	2574	1475	5370	471	717	18510
Adj. R-squared	0.184	0.183	0.204	0.174	0.143	0.235	0.265

Table 3 shows the relationship between color contrast and grant approval across each skin tone group in the sample. Note that skin tone 8 is dropped since there were insufficient no. of observations in that group. The dependent variable is a dummy variable indicating asylum approval. The description of the analytical sample and all the controls and fixed effects used in this table is available in the footnote for column (4) of Table 2. The standard errors are clustered at judge level. +, *, ** and *** indicate significance at the 10%, 5%, 1% and 0.1% levels, respectively.

Table 4: Contrast effects using previous 2 cases

	(1)	(2)
	Asylum Approval	Asylum Approval
Color Contrast (previous 2)	-0.00316+	0.00829+
	(0.00180)	(0.00491)
Skin Tone		-0.0464
		(0.0499)
Color Contrast (previous 2) x Skin Tone		-0.00213*
		(0.000836)
Judge FE	Yes	Yes
Sentencing Year FE	Yes	Yes
Case Controls	Yes	Yes
N	30000	30000
Adj. R-squared	0.231	0.231

Table 4 tests whether contrast effects intensify when the current defendant's skin tone is contrasted with that of the previous two defendants taken together. The Color Contrast (previous 2) variable is defined as the difference between the skin tone of the current defendant and the average of the skin tones of the previous two defendants. The dependent variable is a dummy variable indicating asylum approval. The description of the analytical sample and all the controls and fixed effects used in this table is available in the footnote for column (4) and (5) of Table 2. The standard errors are clustered at judge level. +, *, ** and *** indicate significance at the 10%, 5%, 1% and 0.1% levels, respectively.

Table 5: Placebo Check using contrast with succeeding cases:

	(1)	(2)
	Asylum Approval	Asylum Approval
Color Contrast Future	0.000239	-0.00166
	(0.00117)	(0.00274)
Skin Tone		-0.0736+
		(0.0420)
Color Contrast Future x Skin Tone		0.000355
		(0.000457)
Judge FE	Yes	Yes
Sentencing Year FE	Yes	Yes
Case Controls	Yes	Yes
N	31734	31734
Adj. R-squared	0.228	0.228

Table 5 is a placebo check for color contrast effects. Color Contrast Future is the difference between the skin tone rating of the defendant in the current case and that of the defendant in the immediate next case for the judge. The columns (1) and (2) use judge fixed effects to control for judge specific heterogeneity while (3) and (4) use judge-related controls instead since they use the lagged dependent variable to control for Gambler's fallacy effect. The dependent variable is a dummy variable indicating asylum approval. The description of the analytical sample and all the controls and fixed effects used in this table is available in the footnote for column (4) and (5) of Table 2. The standard errors are clustered at judge level. +, *, ** and *** indicate significance at the 10%, 5%, 1% and 0.1% levels, respectively.

Appendix:

Figure A1: Binscatter plot - Asylum Grant vs Color Contrast

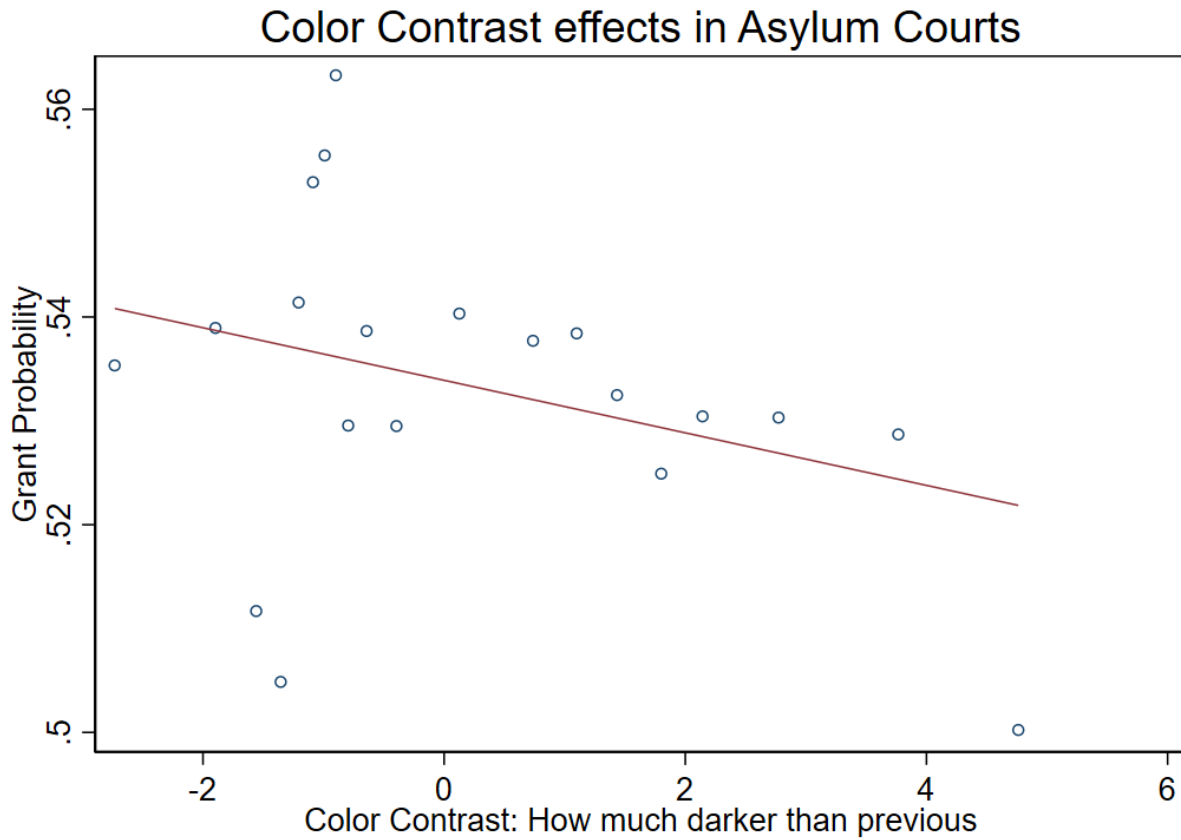


Figure A1 is a binscatter plot between asylum approval probability and color contrast with the previous defendant. Color contrast refers to the degree of darkness in skin tone for the current defendant as compared to the previous defendant. The figure plots the specification used in Table A4 column (1).

Figure A2: Distribution of Skin tone ratings among the defendants:

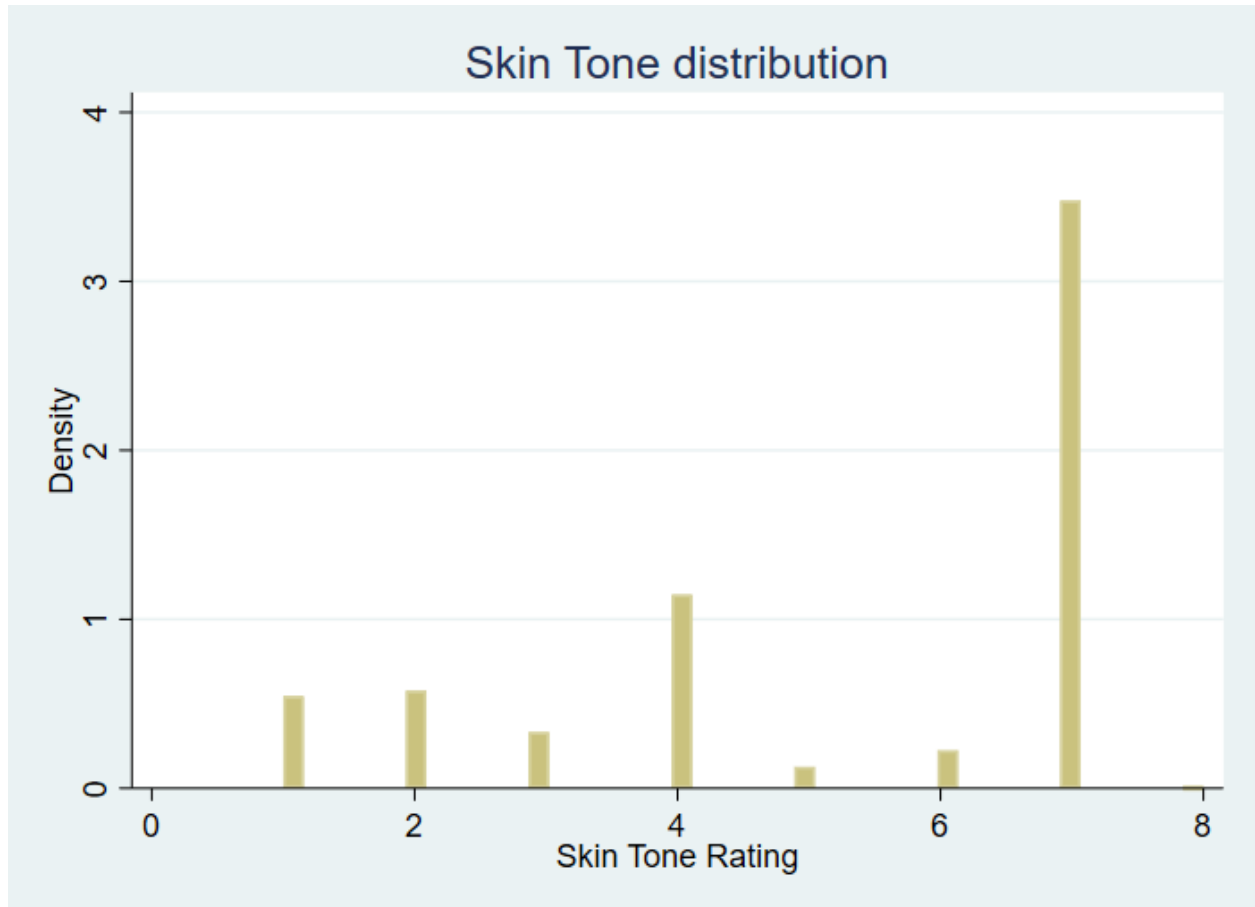


Figure A2 plots a distribution of skin tone in the data. Defendant skin tone was quantified using an integer scale ranging from 1 (lightest) to 8 (darkest) based on national averages.

Table A1: Defensive cases as heterogeneity

	(1)	(2)	(3)	(4)
	Asylum Approval	Asylum Approval	Asylum Approval	Asylum Approval
Color Contrast	-0.00373+	0.0141*	-0.00182	0.00367
	(0.00218)	(0.00676)	(0.00143)	(0.00365)
Skin Tone		-0.0271		-0.0538
		(0.0740)		(0.0474)
Color Contrast x Skin Tone		-0.00306**		-0.00109+
		(0.00113)		(0.000652)
Sample: Defensive Cases	Yes	Yes	No	No
Judge FE	Yes	Yes	Yes	Yes
Sentencing Year FE	Yes	Yes	Yes	Yes
Case Controls	Yes	Yes	Yes	Yes
N	11958	11958	19784	19784
Adj. R-squared	0.235	0.236	0.221	0.221

Table A1 tests for the variation of color contrast effects with respect to asylum approval due to heterogeneity in defensive status of cases in the analytical sample. These are cases in which the applicant applies for asylum after being apprehended by the Department of Homeland Security (DHS).. Columns (1) and (2) sample only defensive cases while (3) and (4) exclude them. The description of the analytical sample and all the controls and fixed effects used in this table is available in the description for columns (4) and (5) of Table 2. The standard errors are clustered at judge level. +, *, ** and *** indicate significance at the 10%, 5%, 1% and 0.1% levels, respectively.

Table A2: Lawyers as heterogeneity

	(1)	(2)	(3)	(4)
	Asylum Approval	Asylum Approval	Asylum Approval	Asylum Approval
Color Contrast	-0.00254*	0.00588+	0.00147	0.0353
	(0.00117)	(0.00322)	(0.00990)	(0.0296)
Skin Tone		-0.0160		-0.354*
		(0.0505)		(0.154)
Color Contrast x Skin Tone		-0.00158**		-0.00757
		(0.000574)		(0.00599)
Sample: Lawyer Present	Yes	Yes	No	No
Judge FE	Yes	Yes	Yes	Yes
Sentencing Year FE	Yes	Yes	Yes	Yes
Case Controls	Yes	Yes	Yes	Yes
N	31046	31046	676	676
Adj. R-squared	0.229	0.229	0.211	0.213

Table A2 tests for the difference in color contrast effects with respect to asylum approval due to heterogeneity of lawyer presence in the analytical sample. Columns(1) and (2) indicate results for the sample where the defendants were represented by a lawyer while (3) and (4) are for the sample of cases where no lawyers were present. The dependent variable is a dummy variable indicating asylum approval for the defendant. The description of the analytical sample and all the controls and fixed effects used in this table is available in the footnote for column (4) and (5) of Table 2. The standard errors are clustered at judge level. +, *, ** and *** indicate significance at the 10%, 5%, 1% and 0.1% levels, respectively.

Table A3: Judge Experience as Heterogeneity

	(1)	(2)	(3)	(4)
	Asylum Approval	Asylum Approval	Asylum Approval	Asylum Approval
Color Contrast	-0.00281*	0.00260	-0.00157	0.00971*
	(0.00140)	(0.00474)	(0.00196)	(0.00405)
Skin Tone		0.00781		-0.0691
		(0.0675)		(0.0827)
Color Contrast x Skin Tone		-0.000994		-0.00216**
		(0.000818)		(0.000758)
Judge Experience	High	High	Low	Low
Judge FE	Yes	Yes	Yes	Yes
Sentencing Year FE	Yes	Yes	Yes	Yes
Case Controls	Yes	Yes	Yes	Yes
N	16173	16173	15601	15601
Adj. R-squared	0.249	0.249	0.182	0.183

Table A3 tests for the difference in color contrast effects with respect to asylum approval due to heterogeneity of lawyer presence in the analytical sample. The specifications are for samples containing judges with 'high experience' in columns (1) and (2) and those with 'low experience' for columns (3) and (4). This categorization is based on a median split of the analytical sample by judge experience. The dependent variable is a dummy variable indicating asylum approval. The description of the analytical sample and all the controls and fixed effects used in this table is available in the footnote for column (4) and (5) of Table 2. The standard errors are clustered at judge level. +, *, ** and *** indicate significance at the 10%, 5%, 1% and 0.1% levels, respectively.

Table A4: Do Color contrast effects persist over a day?

	(1)	(2)	(3)	(4)
	Asylum Approval	Asylum Approval	Asylum Approval	Asylum Approval
Color Contrast	-0.00253*	0.00619*	0.000540	0.00129
	(0.00118)	(0.00314)	(0.00113)	(0.00289)
Color Contrast x Skin Tone		-0.00164**		-0.000147
		(0.000560)		(0.000511)
Lag Sample	Same-day	Same-day	Previous-day	Previous-day
Judge FE	Yes	Yes	Yes	Yes
Sentencing Year FE	Yes	Yes	Yes	Yes
Case Controls	Yes	Yes	Yes	Yes
N	31787	31787	34911	34911
Adj. R-squared	0.230	0.230	0.203	0.203

Table A4 compares contrast effects when sample is restricted to same-day cases only versus when restricted to previous-day cases only. Same-day cases are those cases whose preceding case was heard by the judge on the same day. The color contrast effects measured in this sample are specified by columns (1) and (2). Previous-day cases are those cases where the preceding case was heard by the judge on the previous day and the color contrast effects in this sample are specified in columns (3) and (4). The dependent variable is a dummy variable indicating asylum approval. The description of the analytical sample and all the controls and fixed effects used in this table is available in the footnote for column (4) and (5) of Table 2. The standard errors are clustered at judge level. +, *, ** and *** indicate significance at the 10%, 5%, 1% and 0.1% levels, respectively

Table A5: Diminishing effect of Color contrast across preceding cases

	(1)	(2)
	Asylum Approval	Asylum Approval
Color Contrast	-0.00279*	0.00578+
	(0.00120)	(0.00337)
Color Contrast lag 2	-0.000606	0.00244
	(0.00126)	(0.00357)
Color Contrast lag 3	0.00104	-0.00307
	(0.00121)	(0.00390)
Skin Tone		-0.0508
		(0.0484)
Color Contrast x Skin Tone		-0.00159**
		(0.000579)
Color Contrast lag 2 x Skin Tone		-0.000557
		(0.000643)
Color Contrast lag 3 x Skin Tone		0.000756
		(0.000602)
Judge FE	Yes	Yes
Sentencing Year FE	Yes	Yes
Case Controls	Yes	Yes
N	28386	28386
Adj. R-squared	0.234	0.234

Table A5 tests for the diminishing effect of color contrast across preceding cases. Variables Color Contrast, Color Contrast lag 2 and Color Contrast lag 3 indicate the contrast in skin tone ratings between the current defendant and the preceding first, second and third defendants respectively. The Column (2) specifies interaction terms for each of the above variables with the skin tone of

the current defendant. The dependent variable is a dummy variable indicating asylum approval. The description of the analytical sample and all the controls and fixed effects used in this table is available in the footnote for column (4) and (5) of Table 2. The standard errors are clustered at judge level. +, *, ** and *** indicate significance at the 10%, 5%, 1% and 0.1% levels, respectively.

Table A6: Controlling for contrast in case severity (defensive)

	(1)	(2)
	Asylum Approval	Asylum Approval
Color Contrast	-0.00233+	0.00621+
	(0.00121)	(0.00317)
Defensive case contrast	-0.00510	-0.00501
	(0.00573)	(0.00574)
Skin Tone		-0.0464
		(0.0490)
Color Contrast x Skin Tone		-0.00160**
		(0.000563)
Judge FE	Yes	Yes
Sentencing Year FE	Yes	Yes
Case Controls	Yes	Yes
N	31603	31603
Adj. R-squared	0.231	0.231

Table A6 is a robustness check to see if color contrast effects persist when we control for contrast in defensive cases. Defensive contrast is defined as 1, when the current case is defensive and the previous case is not; -1 for vice versa and 0 when both current and previous cases are similar. The dependent variable is a dummy variable indicating asylum approval. The description of the analytical sample and all the controls and fixed effects used in this table is available in the footnote for column (4) and (5) of Table 2. The standard errors are clustered at judge level. +, *, ** and *** indicate significance at the 10%, 5%, 1% and 0.1% levels, respectively.

Table A7: Contrast effects controlling for Gambler's Fallacy effects

	(1)	(2)	(3)	(4)
	Asylum Approval	Asylum Approval	Asylum Approval	Asylum Approval
Color Contrast	-0.00207+	0.00784**	-0.00203+	0.00795**
	(0.00121)	(0.00298)	(0.00121)	(0.00299)
Skin Tone		-0.0502		-0.0512
		(0.0466)		(0.0469)
Color Contrast x Skin Tone		-0.00188***		-0.00189***
		(0.000536)		(0.000538)
Previous Grant Decision			-0.0173**	-0.0175**
			(0.00659)	(0.00658)
Judge FE	No	No	No	No
Sentencing Year FE	No	No	No	No
Case Controls	Yes	Yes	Yes	Yes
N	31821	31821	31821	31821
Adj. R-squared	0.222	0.223	0.223	0.223

Table A7 shows that the color contrast effects exist simultaneously with Gambler's fallacy effects in asylum court decisions. The columns (1) and (2) show color contrast effects only while (3) and (4) specify both color contrast effects and Gambler's Fallacy effects simultaneously. We see Gambler's fallacy effect when the decision for the current case is influenced by the previous grant decision. The dependent variable is a dummy variable indicating asylum approval. The specifications exclude fixed effects to avoid issues related to dynamic panel bias. The description of the analytical sample and all the controls used in this table is available in the footnote for column (4) and (5) of Table 2. The standard errors are clustered at judge level. +, *, ** and *** indicate significance at the 10%, 5%, 1% and 0.1% levels, respectively.

Table A8: Using Judge x Year Fixed effects

	(1)	(2)
	Asylum Approval	Asylum Approval
Color Contrast	-0.00213+	0.00490
	(0.00119)	(0.00313)
Skin Tone		-0.0660
		(0.0621)
Color Contrast x Skin Tone		-0.00131*
		(0.000560)
Judge x Year FE	Yes	Yes
Case Controls	Yes	Yes
N	31308	31308
Adj. R-squared	0.244	0.244

Table A8 checks for robustness in the coefficient for color contrast when using Judge x Sentencing Year fixed effects. The dependent variable is a dummy variable indicating asylum approval. The description of the analytical sample and all the controls used in this table is available in the footnote for column (4) and (5) of Table 2. The standard errors are clustered at judge level. +, *, ** and *** indicate significance at the 10%, 5%, 1% and 0.1% levels, respectively.