An investigation of the impact of Black male and female actors on US movies' box-office across countries

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Abstract

Globalization has resulted in an environment in which foreign markets constitute a large portion of new product sales. This is particularly the case in the movie industry. The movie industry is also pressured to increase the representation of ethnic minorities, especially in casting choices. We investigate how Black (1) male and (2) female actors affect the country-level international box-office of 788 US movies released in 2012–2019. The results show that Black male (female) actors increase (decrease) a movie's box-office in a given country. Extending developments in the literature on intergroup contact, we examine how these effects are moderated by (a) actors' star power, (b) the number of releases prior to release in the country, (c) the time-lag between worldwide release and release in the country, and (d) whether the country is emerging (vs. developed).

Keywords Movie industry · Ethnic minorities · Representation · Intersectionality · Intergroup contact · New products

1 Introduction

The underrepresentation of ethnic minorities is a widespread phenomenon across many domains, including business leadership (Cook & Glass, 2014), political leadership (Karimi, 2021), academic research (Bradford & Perry, 2021), and even clinical trials (Sheikh, 2006). Unsurprisingly, the underrepresentation of ethnic minorities in Hollywood has long been at the center of debate, while Hollywood has been accused of *whitewashing* (Chow, 2016). Recently, for instance, a cast of mainly White actors portrayed Egyptian deities in Gods of Egypt (2016). Driven by social movements

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advocating for equality, the public is asking Hollywood to increase the representation of ethnic minorities (Low & Jackson, 2020). Following these calls, 2020 marked the first time that ethnic minority actors exceeded proportionate representation, driven by gains among Black male actors (Hunt & Ramón, 2021). Paradoxically, Hollywood has also been recently accused of *blackwashing* when, for instance, Black actors were cast in leading roles in the 2014 adaptation of the Broadway production Annie (1977).

While research has started to examine the effect of Black actors on US movies' domestic box-office (Kuppuswamy & Younkin, 2020), we examine the effect of Black actors on US movies' country-level *international* box-office. In an additional departure from the literature, heeding calls to conduct research on intersectionality (Gopaldas, 2013), we distinguish between Black male and female actors and separately examine their impact on the country-level international box-office of US movies released in 2012–2019. Drawing from social identity theory (Tajfel & Turner, 1979) and the intergroup contact model (Allport, 1954), we investigate how these effects are moderated by (a) actors' star power, (b) the number of releases prior to release in the country, (c) the time-lag between worldwide release and release in the country, and (d) whether the country is emerging (vs. developed).

We consider this to be an important contribution for multiple reasons. First, the representation of ethnic minorities remains a topic on which, unfortunately, opinions are split. While movements such as Black Lives Matter stress the need for equality, regardless of race and gender, many countries are still politically polarized (Pew Research Center, 2014), suggesting that responses to Black actors may be mixed. Second, globalization has led to an environment where foreign markets constitute a large portion of sales (Griffith et al., 2017). This is especially the case in the movie industry (Eliashberg et al., 2006). Due to cultural differences, consumers in different countries may respond differently to Black actors. Third, by separately examining the impact of Black male and female actors, this contribution responds to calls for intersectional studies (Gopaldas, 2013). From a societal perspective, insights into what may improve audience responses to Black actors and the movies they star in are needed in that they could be acted upon to promote greater representation and, in turn, more equitable opportunities for actors of all ethnic origins, with vast benefits for society.

2 Theoretical background

We extend the literature on international box-office, which has neglected representation of ethnic minorities, and the literature on the impact of representation of ethnic minorities on domestic box-office, which has neglected international markets and intersectionality issues.

2.1 International box-office

There is a burgeoning literature on movies' international box-office, which has focused on its product- and country-specific antecedents (Table 4, Appendix 1). Looking at product-specific antecedents, scholars examined star power (Griffith

et al., 2014; Moon et al., 2016), previous releases (Elberse & Eliashberg, 2003; Griffith et al., 2014), and the timing of releases (Elberse & Eliashberg, 2003; Griffith et al., 2014, 2017; Moon et al., 2016; Wu et al., 2022). Looking at country-specific antecedents, studies investigated national cultural dimensions (Griffith et al., 2014), cultural differences and compatibility (Moon & Song, 2015; Moon et al., 2016), and economic development (Griffith et al., 2014; Moon et al., 2016). To the best of our knowledge, no study has examined the effect of the representation of ethnic minorities on movies' country-level international box-office.

2.2 Ethnic minority actors and domestic box-office

The effect of the representation of ethnic minorities on movies' box-office is only now receiving attention (Table 5, Appendix 1). Aumer et al. (2017) find that white-washing may be beneficial, as, under some circumstances, audiences prefer White actors. Hermosilla et al. (2018) find that the Chinese preference for fairer skin is associated with the frequent casting of fair-skinned actors in movies targeting China. Kuppuswamy and Younkin (2020) find that US movies with multiple Black actors have better domestic box-office.[1] Focusing on directors, Karniouchina et al. (2022) find that movies directed by women and minorities fare no different domestically compared to other movies.

The reasons for these mixed findings are twofold. First, these studies neglect heterogeneity within ethnic minorities. Consumers may respond differently to members of ethnic minorities depending, for instance, on their gender (Gopaldas, 2013). Second, consumers' responses to ethnic minority actors may be contingent upon movie and country characteristics. Research is thus needed to understand under which contingencies ethnic minority actors may enhance or dampen international box-office.

2.3 Intersectionality

Crenshaw (1991, p. 1244) coined the term "intersectionality" to describe "the various ways race and gender interact to shape the multiple dimensions of black women's employment experiences." In general, the intersectionality paradigm argues that societal treatment of members of minorities is not homogenous. Despite having attracted considerable attention across numerous fields (Gopaldas, 2013), in marketing, intersectionality has been applied primarily in studies of vulnerable (Saatcioglu & Corus, 2014), impoverished (Lee et al., 1999), and subsistence marketplace (Viswanathan et al., 2010) consumers, surprisingly neglecting the experiences of Black women, whose societal treatment often differs from that of Black men as their ethnic minority status intersects with their gender minority status.

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[1] In an additional analysis, Kuppuswamy and Younkin (2020) find that movies with multiple Black actors fare no different in foreign markets compared to movies with one or zero Black actors. Our contribution differs in many respects, namely, because we (1) use a different operationalization for Black actors, (2) look at country-level international box-office, and (3) distinguish between Black male and female actors.

The literature on ethnic minority actors has not distinguished between male and female actors, which partially explains the inconclusive results. Hence, as societal treatment of Black women differs from that of Black men (Crenshaw, 1991), it is worth investigating whether and how audience responses to Black male and female actors diverge. We note here that this research further deviates from the narrow marketing literature on intersectionality, as it examines intersectionality from the supply side, i.e., service providers, in general, and actors in particular (vs. demand side, i.e., consumers).

3 Hypotheses

According to social identity theory (Tajfel & Turner, 1979), people classify themselves and others into social categories/groups. Group membership, such as membership in ethnic groups (Tajfel, 1978), guides intergroup behavior (Tajfel & Turner, 1979). To reach positive evaluations of one's ingroup, people engage in social comparisons, exhibiting ingroup bias (i.e., elevating the ingroup while derogating the outgroup) and homophily (i.e., favoring intragroup relations over extragroup ones), often resulting in intergroup conflict. Overall, the concepts of ingroup bias, homophily, and intergroup conflict are key underpinnings of social identity theory (Jost et al., 2004). A well-documented intervention to improve intergroup relations is increased exposure to (contact with) the outgroup. According to the literature on intergroup contact (Allport, 1954), while initial exposure to the outgroup is stressful and imbued with suspicion (Bai et al., 2020; Ramos et al., 2019), positive responses can be gradually established with more exposure (Allport, 1954; Bai et al., 2020; Dovidio et al., 2003). Applying this reasoning to our context of investigation, we expect prior exposure to Black actors and, we add, Black people (the outgroup), in general, to result in better attitudes toward them and, in turn, better audience responses to movies casting Black actors.

3.1 Main effects

Black actors have been historically underrepresented in Hollywood (Kuppuswamy & Younkin, 2020). Extending developments in the literature on intergroup contact (Allport, 1954) that prior exposure improves responses to members of the outgroup, one could expect that historically underrepresented—and, therefore, less visible—Black actors may decrease US movies' country-level international box-office. The gap is closing, however, and 2020 marked the first time that ethnic minority actors exceeded proportionate representation, driven by gains among Black *male* actors (Hunt & Ramón, 2021). We expect such changes in Hollywood hiring decisions, combined with the recent widespread media coverage of social movements opposing systemic racism, to have resulted in more (and better) recent exposure to Black actors. Against this backdrop, we expect Black *male* actors to increase movies' country-level international box-office. Nonetheless,

integrating developments in the literature on intersectionality (Crenshaw, 1991) with emerging evidence that Black women are still significantly underrepresented (Hunt & Ramón, 2021), we expect Black *female* actors to decrease movies' country-level international box-office:

$H_{1a(b)}$: Black male (female) actors increase (decrease) a movie's box-office in a country.

3.2 Moderation effects

3.2.1 Star power

Star power has been shown to drive box-office in previous research (Liu et al., 2014). Consumers are more familiar with stars (Griffith et al., 2017). Furthermore, as stars generate buzz, the media is more likely to cover them and their movies (Karniouchina, 2011). Hence, we expect that as a Black actor's star power increases, superior prior exposure will result in better responses to the actor and, in turn, to the movie they star in:

$H_{2a(b)}$: The higher the star power of Black male (female) actors, the more positive (less negative) their effect on the movie's box-office in a country.

3.2.2 Previous releases

According to the literature on the lead-lag effect (Kumar et al., 2011), more releases of a movie prior to release in the focal country should result in consumers' greater exposure to the movie and, in turn, better box-office, as consumers in lag countries learn about the movie from consumers in lead countries (Dhar et al., 2012; Kumar et al., 2011). Hence, we argue that as the number of previous releases of a movie starring Black actors increases, greater prior exposure will result in better responses to the actors and, in turn, to the movie they star in:

$H_{3a(b)}$: The greater the number of previous releases in other countries, the more positive (less negative) the effect of Black male (female) actors on the movie's box-office in a country.

3.2.3 Time-lag

Prior research has shown that the time-lag between a movie's worldwide release and its release in the focal country reduces box-office (Elberse & Eliashberg, 2003; Griffith et al., 2014) due to the perishability of buzz and advertising (Elberse & Eliashberg, 2003; Griffith et al., 2017). As the time-lag increases, however, consumers may have more time to become exposed to the Black actors starring in the movie. A

longer time-lag may, in fact, allow promotional messages to become more visible to consumers (Karniouchina, 2011). Hence, we argue that as the time-lag between worldwide release and release in the focal country of a movie starring Black actors increases, superior prior exposure will result in better responses to the actors and, in turn, to the movies they star in:

> $H_{4a(b)}$: The longer the time-lag between worldwide release and release in a country, the more positive (less negative) the effect of Black male (female) actors on the movie's box-office in the country.

3.2.4 Emerging country

Consumers in emerging (vs. developed) countries are less likely to be interested in other cultures (Skrbis et al., 2004) as well as to have the wealth and willingness to travel to experience other cultures (Cannon & Yaprak, 2002), both necessary conditions to increase one's prior exposure to members of outgroups. Taken together, these insights hint at the fact that consumers in emerging countries where Blacks are not the majority ethnic group may have had less prior exposure to them compared to consumers in developed countries. Hence, we argue that, in emerging (vs. developed) countries, inferior prior exposure to Blacks will result in worse responses to Black actors and, in turn, to the movies they star in:

> $H_{5a(b)}$: The effect of Black male (female) actors on a movie's country-level box-office is less positive (more negative) in emerging (vs. developed) countries.

Figure 1 outlines the conceptual framework.

4 Data

We collected data from the-numbers.com on Hollywood non-animation movies released in 2012–2019. For each leading actor (i.e., actor listed on a movie's theatrical poster), we downloaded a close-medium shot from IMDb. We used machine learning to determine, for each actor, the ethnic group to which they belong (i.e., Asian, Black, Hispanic, or White). To do so, we chose kairos.com, a deep learning face and diversity recognition algorithm. We also used kairos.com to determine the gender of each actor. We provide the variables in Table 1 and descriptives in Table 6, Appendix 2.

Combining data (less observations with missing values) resulted in 15,119 movie-country observations (788 movies, 63 countries, Table 7, Appendix 3). We note that as we focus on international box-office, we excluded releases in the USA (Moon & Song, 2015). To allow for a clean test of the hypotheses, we also excluded majority-Black countries, i.e., countries where Blacks and/or Mixed Blacks constitute the majority ethnic group.
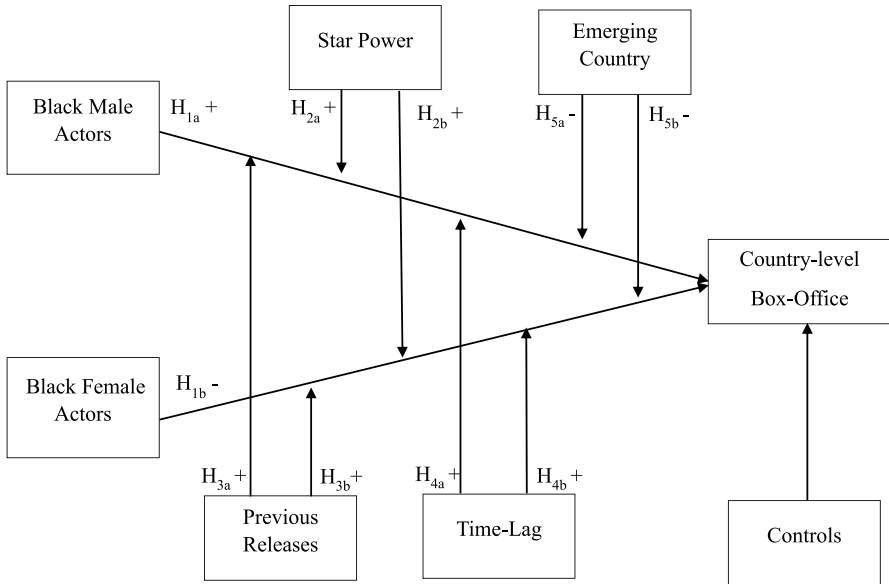
Fig. 1 Conceptual framework

5 Estimation

Observing the box-office of a movie in a country requires the movie to have been released in that country. Hence, we run a Heckman sample selection model to predict a movie's likelihood of release in a country as follows:[2,3]

$$
\begin{aligned}
\text{Likelihood of Release}_{ic} = {} & \mu_0 + \mu_1 \text{Black Male Actors}_i + \mu_2 \text{Black Female Actors}_i \\
& + \mu_3 \text{Emerging Country}_c \\
& + \mu_4 \text{Sequel}_i + \mu_5 \text{Remake}_i + \mu_6 \text{Real} - \text{life}_i + \mu_7 \text{Director Power}_i \\
& + \mu_8 \text{Minority Director}_i + \mu_9 \text{Critic Review Score}_i + \mu_{10} \text{Budget}_i \\
& + \mu_{11} \text{Star Power}_i + \mu_{12} \text{Major Producer}_i \\
& + \mu_{13} \text{Cultural Distance}_c + \mu_{14} \text{Indulgence}_c + \mu_{15} \text{Female Actors}_i \\
& + \mu_{16} \text{Number of Actors}_i + \mu_{17} \text{Inst}_{ic} \\
& + \sum_{\mu=18}^{22} \text{MPAA Rating}_i \\
& + \sum_{\mu=23}^{31} \text{Genre}_i \\
& + \sum_{\mu=32}^{40} \text{Year of Production}_i + \sum_{\mu=41}^{102} \text{Country}_c + \alpha_{ic}
\end{aligned}
\tag{1}
$$

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[2] MPAA Ratings: G (general audiences), PG (possibly unsuitable for children), R (restricted), NC-17 (no one under 17 admitted), NR (not rated), or OPEN.

[3] Genres: Action, adventure, comedy, concert/performance, documentary, drama, horror, musical, thriller/suspense, or Western.

Table 1 Variables

Variable	Measure
Box-office	Revenue in $ in the country*
Black male actors	Number of Black male leading actors over leading actors
Black female actors	Number of Black female leading actors over leading actors
Star power of Black male actors	Average movie gross in $ for each Black male leading actor, averaged across all Black male leading actors, prior to the movie's worldwide release date*
Star power of Black female actors	Average movie gross in $ for each Black female leading actor, averaged across all Black female leading actors, prior to the movie's worldwide release date*
Previous releases	Number of countries in which the movie has been released before release in the country*
Time-lag	Number of days between the worldwide release of the movie and release in the country*
Emerging country	1 for countries classified as Emerging in the IMF's World Economic Outlook, 0 otherwise
Sequel	1 if the movie is a sequel, 0 otherwise
Remake	1 if the movie is a remake, 0 otherwise
Real-life	1 if the movie is based on real-life events, 0 otherwise
Director power	Average movie gross in $ for the director prior to the movie's worldwide release date*
Minority director	1 if the director is ethnic minority or female, 0 otherwise
Critic review	Aggregated critic review score from rottentomatoes.com*
Budget	Budget in $*
Star power	Average movie gross in $ for each leading actor, averaged across all leading actors, prior to the movie's worldwide release date*
Distribution intensity	Number of theatrical engagements for the movie in the country (where one theatrical engagement means playing in a theater for one week)*
Competitive intensity	Number of movies released in the month of a movie's initial release in the country*
Major producer	1 for movies produced by major companies, 0 otherwise
Cultural distance	Cultural distance between the USA and the country (Kogut & Singh, 1988)
Indulgence	Country indulgence score (Hofstede et al., 2010)
Post 2014	1 for movies released after 2014, 0 otherwise
Female actors	Number of female leading actors over leading actors
Number of actors	Number of leading actors*

*Logged

where μs are the parameters to be estimated, subscripts i are movies, subscripts c are countries, and α_{ic}s are error terms. Inst is an instrument for the probability of a movie being released in a country. We use as instrument the average number

of country releases for movies produced in the same year as the focal movie. The model is a probit model.

For hypothesis testing, we estimate the following model:

$$
\begin{aligned}
\text{Box} - \text{Office}_{ic} = {} & \beta_0 + \beta_1 \text{Black Male Actors}_i \\
& + \beta_2 \text{Black Female Actors}_i \\
& + \beta_3 \text{Black Male Actors}_i \times \text{Star Power of Black Male Actors}_i \\
& + \beta_4 \text{Black Male Actors}_i \times \text{Previous Releases}_{ic} \\
& + \beta_5 \text{Black Male Actors}_i \times \text{Time} - \text{Lag}_{ic} + \beta_6 \text{Black Male Actors}_i \times \text{Emerging Country}_c \\
& + \beta_7 \text{Black Female Actors}_i \times \text{Star Power of Black Female Actors}_i \\
& + \beta_8 \text{Black Female Actors}_i \times \text{Previous Releases}_{ic} \\
& + \beta_9 \text{Black Female Actors}_i \times \text{Time} - \text{Lag}_{ic} \\
& + \beta_{10} \text{Black Female Actors}_i \times \text{Emerging Country}_c \\
& + \beta_{11} \text{Star Power of Black Male Actors}_i \\
& + \beta_{12} \text{Star Power of Black Female Actors}_i + \beta_{13} \text{Previous Releases}_{ic} \\
& + \beta_{14} \text{Time} - \text{Lag}_{ic} \\
& + \beta_{15} \text{Emerging Country}_c + \beta_{16} IMR_{ic} \\
& + \sum_{\beta=17}^{21} \text{MPAA Rating}_i \\
& + \sum_{\beta=22}^{30} \text{Genre}_i + \sum_{\beta=31}^{39} \text{Year of Production}_i + \sum_{\beta=40}^{101} \text{Country}_c + \text{Controls} + \varepsilon_{ic}
\end{aligned}
\tag{2}
$$

where βs are the parameters to be estimated, subscripts i are movies, subscripts c are countries, and ε_{ic}s are error terms. IMR is the inverse mills ratio from Eq. 1. *Controls* is the full set of controls in Table 1. Variables expressed in dollars (star power of Black female actors excluded) are winsorized. One potential concern is focal construct endogeneity. We offer a robustness check adopting a control function approach (Petrin & Train, 2010) (Table 8, Appendix 3). The results do not change.

6 Results

The results from the sample selection model are reported in Column 1, Table 2 (pseudo $R^2 = 47\%$). The instrument is significant ($b = -4.84$, $p < 0.01$).[4] Both Black male ($b = -0.17$, $p < 0.01$) and female ($b = -0.18$, $p < 0.05$) actors reduce a movie's likelihood of being released in a country, effects that likely represent studios' expectations of reduced box-office for movies with Black leads (Duke, 2014). In Column 2, we ran the box-office model including the key independent variables ($R^2 = 60\%$). In Column 3, we report the results from the model in Eq. 2 ($R^2 = 77\%$). We summarize the hypothesis testing results in Table 3.

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[4] While the instrument and the dependent variable, i.e., likelihood of release, are positively correlated ($\rho = .14$, $p < 0.05$), the coefficient for the instrument in Column 1, Table 2, is negative and significant. This may reflect a deterrence effect from increased competition. We are thankful to an anonymous reviewer for this suggestion.

Table 2 Results

DV:	Likelihood of release	Box-Office	
	1	2	3
	Unstandardized coefficients (SE)		
Black male actors	−0.17 (0.05)***	−0.06 (0.05)	0.37 (0.16)**
Black female actors	−0.18 (0.08)**	−0.57 (0.07)***	−0.76 (0.22)***
Black male actors × star power of Black male actors			−0.05 (0.01)***
Black male actors × previous releases			−0.06 (0.04)
Black male actors × time-lag			0.05 (0.03)**
Black male actors × emerging country			−0.20 (0.09)**
Black female actors × star power of Black female actors			−0.01 (0.01)
Black female actors × previous releases			0.19 (0.06)***
Black female actors × time-lag			0.08 (0.03)**
Black female actors × emerging country			−0.13 (0.11)
Star power of Black male actors			0.02 (0.003)***
Star power of Black female actors			−0.01 (0.01)
Previous releases			0.03 (0.01)**
Time-lag			−0.20 (0.01)***
Emerging country	−3.51 (0.09)***		−0.22 (0.13)*
Sequel	0.03 (0.03)		0.29 (0.02)***
Remake	0.04 (0.03)		−0.09 (0.03)***
Real-life	−0.13 (0.03)***		−0.01 (0.03)
Director power	−0.001 (0.001)		−0.001 (0.001)
Minority director	0.02 (0.02)		−0.002 (0.02)
Critic review	0.09 (0.02)***		0.19 (0.02)***
Budget	0.12 (0.02)***		0.37 (0.02)***
Star power	0.01 (0.002)***		−0.002 (0.001)
Distribution intensity			0.50 (0.04)***
Competitive intensity			−0.30 (0.04)***
Major producer	0.05 (0.02)**		0.03 (0.02)**
Cultural distance	0.93 (0.03)***		−0.63 (0.10)***
Indulgence	−0.005 (0.0002)***		0.02 (0.001)***
Post 2014			−0.38 (0.06)***
Female actors	0.01 (0.02)		0.10 (0.03)***
Number of actors	−0.01 (0.01)		−0.06 (0.01)***
Instrument	−4.84 (0.25)***		
IMR		−1.15 (0.08)***	−0.11 (0.04)**
MPAA rating FEs	YES	YES	YES
Genre FEs	YES	YES	YES
Year FEs	YES	YES	YES
Country FEs	YES	YES	YES
Observations	*57,141*	*15,119*	*15,119*
Pseudo R²	*0.47*		
R²		*0.60*	*0.77*

*$p < 0.10$. **$p < 0.05$. ***$p < 0.01$. Regressions include a constant and cluster-robust SEs

Table 3 Summary of hypothesis testing

Variables	Hypothesized effect	Result (DV: country-level box-office)
Black male	H_{1a}: **Positive**	**Positive**
Black male × star power	H_{2a}: Positive	Negative[a]
Black male × previous releases	H_{3a}: Positive	Not significant
Black male × time-lag	H_{4a}: Positive	Positive
Black male × emerging country	H_{5a}: Negative	Negative
Black female	H_{1b}: **Negative**	**Negative**
Black female × star power	H_{2b}: Positive	Not significant
Black female × previous releases	H_{3b}: Positive	Positive
Black female × time-lag	H_{4b}: Positive	Positive
Black female × emerging country	H_{5b}: Negative	Not significant

[a] We reason that when an actor becomes a *star*, they may be de-categorized (Dovidio et al., 2003). In other terms, a Black star is not considered a *Black actor*, whereas just an *actor*

7 Discussion

This first study of the impact of Black actors on US movies' country-level international box-office offers four contributions. First, by showing that casting Black actors affects international box-office, the study extends the literature on international box-office, which has overlooked the representation of ethnic minorities. Second, the study extends the nascent literature on the effects of the representation of ethnic minorities on domestic box-office (Kuppuswamy & Younkin, 2020), which has, conversely, overlooked international markets. In doing so, the study shows that mixed results in the literature can be explained by (1) heterogeneity within ethnic minorities and (2) movie- and country-level contingencies. Third, by separately examining the effects of Black male and female actors, this study answers calls to conduct research on intersectionality (Gopaldas, 2013). Last, the additional analysis we ran on majority-Black countries (Table 10, Appendix 3) answers calls to conduct studies on Black consumers, who have been traditionally neglected (Bradford & Perry, 2021).

This research is important from a practical perspective. The moderation effects indirectly support our reasoning that intergroup contact helps promote better audience responses to Black actors. While early analysts expected international markets to be inherently racist (Duke, 2014), we show that the actual problem may be a lack of prior exposure, a phenomenon that can be addressed by casting more Black actors in the first place. Our findings are useful for studios. Studios could consider delaying the release of movies starring Black male actors in the most relevant foreign markets, especially if these are emerging markets. They could also consider delaying the release of movies starring Black female actors in the most relevant foreign markets, anticipating launches in other countries. Interestingly, the marginal effects of the significant interactions of Black female actors (Fig. 2, Appendix 4) show that the

negative effect of Black female actors disappears with numerous previous releases or long time-lags. Last, this research is important from a societal perspective. Hollywood movies are powerful sociocultural icons. Increasing the representation of ethnic minorities would improve the reception of movies with Black actors and promote more equitable opportunities inside and outside the movie industry, with vast benefits for society.

This study has limitations that represent directions for future research. First, we only examine Black actors. Although we run additional analyses using Asian and Hispanic actors (Table 10, Appendix 3), future work focusing on them would also be beneficial. Second, we do not look at intersectionality associated with age. In recent years, actors have become increasingly vocal about older women being disadvantaged in Hollywood. We would consider a future study of ageism to be a valuable extension. Third, we only look at whether a country is emerging (vs. developed). Although we run analyses using the Inglehart-Welzel classification of countries (Tables 8 and 9, Appendix 3), future work using other country characteristics would be useful. Last, by using an algorithm to classify actors, the choice of photos may have inadvertently introduced some bias. While we checked the face validity of the results using a subsample of actors, this should be borne in mind when interpreting our findings.

Appendix 1

Table 4 Literature on International Box-Office

Paper	Time period	Countries	Country-level box-office	Emerging countries	Ethnic minorities
Elberse and Eliashberg (2003)	1999	5	Yes	No	No
Griffith et al. (2014)	2006–2007	16	Yes	Yes	No
Kim and Jensen (2014)	2004–2006	33	Yes	Yes	No
Moon and Song (2015)	2003–2005	47	Yes	Yes	No
Moon et al. (2016)	2008–2015	47	Yes	Yes	No
Griffith, et al. (2017)	1990–2009	80	No	Yes	No
Bae and Kim (2019)	2012–2016	1	/	No	No
Gao et al. (2020)	2011–2018	1	/	Yes	No
Wu et al. (2022)	2009–2014	1	/	Yes	No
This paper	*2012–2019*	*63*	*Yes*	*Yes*	*Yes*

Table 5 Literature on ethnic minorities and domestic box-office

Paper	Methodology	Time period	International box-office	Country-level international box-office	Intersectionality
McKenzie (2010)	Secondary data	1997–2007	No	/	No
Aumer et al. (2017)	Experimental	Experimental	No	/	No
Hermosilla et al. (2018)	Secondary data	2009–2015	No	/	No
Kuppuswamy and Younkin (2020)	Secondary data + Experimental	2011–2016	Yes	No	No
Karniouchina et al. (2022)	Secondary data	1994–2016	No	/	No
This paper	*Secondary data*	*2012–2019*	*Yes*	*Yes*	*Yes*

Appendix 2

Table 6 Descriptives

	Mean	Std. Dev	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1. Box-office[a,c]	13.05	1.97	1																							
2. Black male actors	0.06	0.18	-0.02*	1																						
3. Black female actors	0.02	0.13	-0.07*	0.01	1																					
4. Star power of Black male actors[a,c]	1.65	5.25	0.01	0.79*	0.01	1																				
5. Star power of Black female actors[a]	0.33	2.38	-0.07*	0.05*	0.66*	0.08*	1																			
6. Previous releases[a]	2.65	1.06	0.09*	0.01	-0.01	0.04*	-0.02*	1																		
7. Time-lag[a]	2.71	1.51	-0.28*	0.06*	-0.002	0.001	-0.01	-0.13*	1																	
8. Emerging country	0.44	0.50	-0.08*	-0.01	0.0002	0.01	-0.003	0.09*	-0.03*	1																
9. Sequel	0.23	0.42	0.26*	0.07*	-0.02*	0.10*	-0.02*	0.15*	-0.30*	0.03*	1															
10. Remake	0.03	0.18	-0.01	0.004	-0.01	0.03*	0.02*	-0.03*	-0.01	0.01	-0.06*	1														
11. Real-life	0.07	0.26	-0.04*	0.02	-0.05*	-0.05*	-0.04*	-0.01	0.13*	-0.02*	-0.15*	-0.05*	1													
12. Director power[a,c]	14.48	7.18	0.14*	-0.04*	0.03*	0.001	0.03*	0.09*	-0.10*	0.01	0.11*	-0.02*	0.11*	1												
13. Minority director	0.25	0.43	-0.08*	0.17*	0.09*	0.08*	0.08*	0.01	0.09*	-0.001	-0.06*	-0.01	-0.02*	-0.08*	1											
14. Critic review score[a]	3.90	0.66	0.04*	-0.02*	-0.02*	-0.05*	-0.08*	0.02*	0.13*	-0.04*	-0.10*	-0.07*	0.14*	0.11*	0.04*	1										
15. Budget[a,c]	17.33	1.16	0.41*	0.05*	-0.17*	0.13*	-0.08*	0.22*	-0.37*	0.06*	0.33*	-0.01	-0.002	0.35*	-0.16*	-0.06*	1									
16. Star power[a,c]	16.27	5.59	0.05*	0.04*	-0.15*	0.12*	0.04*	0.05*	-0.01	-0.01	-0.01	-0.03*	0.08*	0.14*	-0.07*	0.06*	0.29*	1								
17. Distribution intensity[a]	5.01	1.85	0.73*	-0.01	-0.04*	0.01	-0.03*	0.07*	-0.16*	-0.04*	0.17*	0.01	-0.02*	0.08*	-0.03*	0.005	0.23*	0.03*	1							

Table 6 (continued)

	Mean	Std. Dev	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
18. Competitive intensity[b]	1.74	0.63	0.03*	−0.04*	−0.04*	−0.03*	−0.06*	−0.15*	0.12*	−0.18*	−0.14*	0.02*	0.04*	−0.03*	0.01	−0.03*	−0.13*	−0.02	0.17*	1						
19. Major producer	0.46	0.50	0.14*	0.04*	0.004	0.04*	−0.0001	0.14*	−0.11*	0.04*	0.15*	−0.07*	0.02*	0.17*	−0.09*	0.02*	0.21*	0.04*	0.08*	−0.10*	1					
20. Cultural distance	1.76	1.32	−0.15*	−0.004	−0.01	0.01	−0.01	0.04*	−0.04*	0.05*	0.03*	0.004	−0.01	0.02*	−0.01	−0.03*	0.05*	0.02*	−0.07*	−0.10*	0.01	1				
21. Indulgence	47.10	21.57	0.22*	0.002	0.01	−0.01	−0.004	−0.05*	0.08*	−0.13*	−0.02*	0.001	0.01	−0.02*	0.01	0.04*	−0.06*	−0.03*	0.14*	0.11*	−0.005	−0.34*	1			
22. Post 2014	0.68	0.47	−0.02*	0.09*	0.01	0.04*	0.06*	0.04*	−0.11*	−0.04*	0.07*	0.01	0.04*	−0.002	0.11*	−0.03*	−0.09*	−0.02	0.18*	0.01	−0.11*	0.02*	−0.02	1		
23. Female actors	0.38	0.37	−0.08*	−0.23*	0.23*	−0.21*	0.15*	−0.03*	0.03*	−0.01	−0.06*	0.01	−0.06*	−0.10*	0.04*	−0.08*	−0.29*	−0.17*	−0.04*	−0.01	−0.02*	−0.02*	0.02	0.08*	1	
24. Number of actors[b]	0.62	0.52	−0.03*	0.04*	−0.05*	0.12*	0.01	0.04*	−0.005	0.002	0.07*	0.02*	−0.04*	0.04	0.004	−0.08*	0.03*	0.19*	−0.01	0.02*	0.03*	0.01	−0.01	0.05*	−0.03*	1

* $p < 0.05$; [b]logged, [w]winsorized

Appendix 3

Table 7 Countries

Emerging	Albania, Argentina, Bangladesh, Brazil, Bulgaria, Chile, China, Colombia, Croatia, Egypt, El Salvador, Georgia, **Ghana,** Hungary, India, Indonesia, Iraq, Jordan, Lebanon, Malaysia, Mexico, **Nigeria**, North Macedonia, Pakistan, Paraguay, Peru, Philippines, Poland, Romania, Russia, Serbia and Montenegro[a], **South Africa**[b], Thailand, **Trinidad and Tobago,** Turkey, Ukraine, Uruguay, Venezuela, Vietnam
Developed	Australia, Austria, Belgium, Denmark, Estonia, Finland, France, Germany, Greece, Hong Kong, Iceland, Italy, Japan, Latvia, Lithuania, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Singapore, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Taiwan, UK, USA

[a] the-numbers.com combines Serbia and Montenegro. We use cultural distance and indulgence for Serbia, the most populated country in the pair

[b] Majority-Black (in bold) are excluded from the main analysis

Table 7
Additional analyses

Endogeneity

Decisions on whether casting Black actors may be endogenous. Hence, we re-ran our analyses using a control function approach (Petrin & Train, 2010). To instrument Black male actors, we regressed it on the average incidence of Black male actors (focal movie excluded) for movies produced in the same year. We expect other movies' casting decisions to be correlated with the focal movie's casting decisions (see, e.g., Germann et al. (2015) for a similar logic). We proceeded analogously for Black female actors. Other movies' casting choices significantly predict the focal movie's casting choices ($p < 0.01$). We then estimated the model of box-office including the residuals from the instrumental variable equations. The results (Column 1, Table 8) are robust.

No correction for sample selection

We re-ran the analyses without including the IMR. The results (Column 2, Table 8) do not change.

Inglehart-Welzel values (2022)

We re-ran the analyses including the interactions of countries' traditional and survival values with Black actors, as we reason that these may affect audience responses. The results (Column 3, Table 8) are robust. The interaction of survival values with Black female actors is marginally significant ($b = 0.10$, $p = 0.062$).

Table 8 Additional analyses

	Endogeneity	No IMR	Traditional and survival values
	1	2	3
Black male actors	0.42 (0.17)**	0.35 (0.16)**	0.44 (0.18)**
Black female actors	−0.75 (0.22)***	−0.77 (0.23)***	−1.04 (0.25)***
Black male actors × star power of Black male actors	−0.05 (0.01)***	−0.05 (0.01)***	−0.05 (0.01)***
Black male actors × previous releases	−0.03 (0.04)	−0.06 (0.04)	−0.06 (0.04)
Black male actors × time-lag	0.08 (0.03)***	0.06 (0.03)**	0.06 (0.03)**
Black male actors × emerging country	−0.19 (0.09)**	−0.20 (0.09)**	−0.30 (0.14)**
Black female actors × star power of Black female actors	−0.01 (0.01)	−0.01 (0.01)	−0.01 (0.01)
Black female actors × previous releases	0.19 (0.06)***	0.20 (0.06)***	0.21 (0.06)***
Black female actors × time-lag	0.08 (0.04)**	0.07 (0.03)**	0.07 (0.03)**
Black female actors × emerging country	−0.13 (0.11)	−0.13 (0.11)	0.11 (0.16)
Black male actors × traditional values			0.04 (0.07)
Black male actors × survival values			−0.07 (0.05)
Black female actors × traditional values			0.08 (0.10)
Black female actors × survival values			0.10 (0.05)*
Traditional values			−5.51 (0.59)***
Survival values			5.22 (0.58)***
Instrument-Black male actors	−0.52 (0.10)***		
Instrument-Black female actors	−0.04 (0.28)		
IMR	−0.11 (0.04)**		−0.11 (0.04)**
Observations	*15,119*	*15,119*	*14,761*
R^2	*0.77*	*0.77*	*0.77*

*$p < 0.10$. **$p < 0.05$. ***$p < 0.01$. Controls are included but not reported in the interest of brevity

Inglehart-Welzel Map of the World (2022)

We re-ran the analyses including fixed-effects for the country clusters in the Inglehart-Welzel Map of the World.[5] The results, available upon request, are robust. Further, we ran separate analyses for each cluster. A summary of the results for the main effects is reported in Table 9. Black male actors increase box-office in Confucian countries ($b = 1.76$, $p < 0.05$). Black female actors decrease box-office in Catholic Europe, marginally ($b = -0.59$, $p < 0.10$), Latin America ($b = -2.43$, $p < 0.01$), and West and South Asia ($b = -2.42$, $p < 0.01$), while they increase it in Orthodox Europe ($b = 0.83$, $p < 0.05$).

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[5] worldvaluessurvey.org.

Table 9 Cultural clusters

Cluster	Black male	Black female	Observations	R^2
African-Islamic	0.14 (0.96)	− 0.39 (0.40)	1,347	78%
Catholic Europe	0.35 (0.21)	**− 0.59 (0.32)***	4,327	80%
Confucian	**1.76 (0.42)****	− 0.34 (0.52)	892	84%
English-speaking	0.78 (0.30)	− 0.60 (0.57)	1,530	81%
Latin America	− 0.54 (0.52)	**-2.43 (0.57)*****	2,243	72%
Orthodox Europe	− 0.29 (0.35)	**0.83 (0.27)****	1,516	77%
Protestant Europe	0.67 (0.39)	0.17 (0.63)	2,047	73%
West and South Asia	− 0.38 (0.60)	**-2.42 (0.52)*****	1,152	74%

*$p < 0.10$. **$p < 0.05$. ***$p < 0.01$. Controls and interactions are included but not reported in the interest of brevity

Asian actors

We re-ran the analyses using Asian actors, excluding majority-Asian countries. Asian male actors reduce box-office ($b = -2.02$, $p < 0.01$). The effect of Asian female actors is not significant ($b = 0.47$, $p > 0.10$) (Panel A, Table 10).

Hispanic actors

We re-ran the analyses using Hispanic actors, excluding majority-Hispanic countries. Hispanic male ($b = -0.04$, $p > 0.10$) and female ($b = 0.32$, $p > 0.10$) actors do not affect box-office (Panel B, Table 10).

Majority-Black countries

We re-ran the analyses focusing on majority-Black countries. Black male ($b = 0.63$, $p < 0.05$) and female ($b = 2.36$, $p < 0.05$) actors increase box-office (Panel C, Table 10). The reversal of the effect of Black female actors may be ascribed to ingroup bias and homophily as, in majority-Black countries, the ingroup is constituted by Blacks.

USA

We re-ran the analyses focusing on domestic box-office. Neither Black male ($b = 0.19$, $p > 0.10$) nor female ($b = 0.16$, $p > 0.10$) actors affect box-office (Panel D, Table 10).

White actors

We re-ran the analyses using White actors, excluding majority-White countries. Neither White male ($b = -0.27$, $p > 0.10$) nor female ($b = -0.37$, $p = 0.092$) actors

Table 10 Additional Analyses (cont.)

Asian actors		Hispanic actors	
A		**B**	
Asian male actors	−2.02 (0.30)***	Hispanic male actors	−0.04 (0.17)
Asian female actors	0.47 (0.89)	Hispanic female actors	0.32 (0.22)
Observations	*12,763*	*Observations*	*13,174*
R²	*0.77*	*R²*	*0.78*
Majority-Black countries		**USA**	
C		**D**	
Black male actors	0.63 (0.15)**	Black male actors	0.19 (0.15)
Black female actors	2.36 (0.59)**	Black female actors	0.16 (0.18)
Observations	*473*	*Observations*	*908*
R²	*0.81*	*R²*	*0.96*
White actors in non-majority-White countries		**White actors in majority-White countries**	
E		**F**	
White male actors	−0.27 (0.21)	White male actors	0.33 (0.14)**
White female actors	−0.37 (0.21)*	White female actors	0.59 (0.13)***
Observations	*4,774*	*Observations*	*10,818*
R²	*0.78*	*R²*	*0.79*

$*p<0.10$. $**p<0.05$. $***p<0.01$. Controls and interactions are included but not reported in the interest of brevity

significantly affect box-office (Panel E, Table 10). Consumers in non-majority-White countries may not react negatively to White actors as White actors have been historically overrepresented in Hollywood, so that prior exposure may have over time cancelled out ingroup bias against them.

We further re-ran the model in Panel E, Table 10, focusing on majority-White countries. White male ($b = 0.33$, $p < 0.05$) and female ($b = 0.59$, $p < 0.01$) actors increase box-office (Panel F, Table 10). This effect may be ascribed to ingroup bias and homophily as, in majority-White countries, the ingroup is constituted by Whites.

Appendix 4
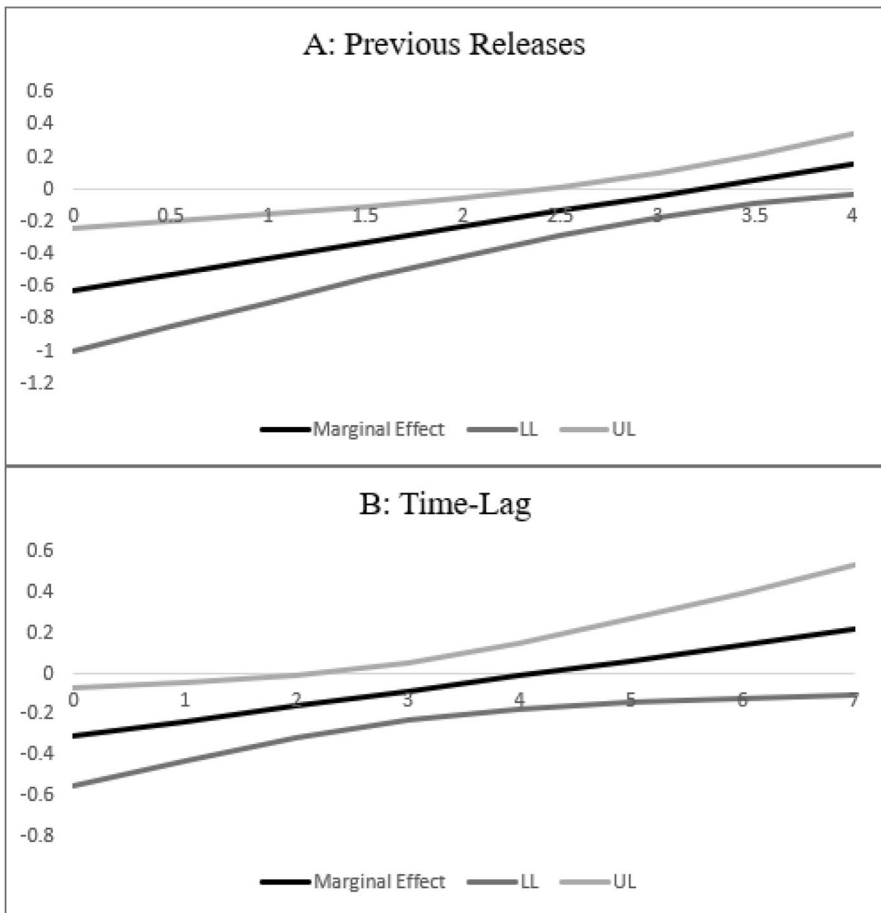
Fig. 2 Black female actors: marginal effects. **A** Previous releases. **B** Time-lag

Declarations

Ethical approval Not applicable

Conflict of interest The authors declare no competing interests.

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