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Age, Gender, and Compensation: A Study of Hollywood Movie Stars

Irene E. De Pater[1], Timothy A. Judge[2,3,4], and Brent A. Scott[5]

Abstract

Research on the gender-wage gap shows equivocal evidence regarding its magnitude, which likely stems from the different wage-related variables researchers include in their calculations. To examine whether pay differentials solely based on gender exist, we focused on the earnings of top performing professionals within a specific occupation to rule out productivity-related explanations for the gender-wage gap. Specifically, we investigated the interaction of gender and age on the earnings of Hollywood top movie stars. The results reveal that the average earnings per film of female movie stars increase until the age of 34 but decrease rapidly thereafter. Male movie stars' average earnings per film reach the maximum at age 51 and remain stable after that.

Keywords

diversity/gender, compensation, bonuses and benefits, careers

> It's the nature of the business. People equate success with youth.
>
> —Jennifer Jason Leigh (Lemons, 2001)

> There is still a discrepancy in earning power between men and women in Hollywood. And it becomes doubly unfair when you think of our earning potential in terms of years. Actresses are like football players. They have a small window of prime earning ability.
>
> —Sarah Jessica Parker (Benatar, 1995)

Many events that took place in the 20th century advanced women's participation in all aspects of society. In 1920, American women won the right to vote, and the Equal Pay Act of 1963 banished separate pay scales for men and women in the same jobs. The Civil Rights Act of 1964 illegitimatized discrimination on the basis of sex (as well as race, color, religion, and national origin) and banned discrimination in hiring, salary, and promotion, to open up male-dominated jobs to women. These policies and legislation have stimulated women to enter the labor market and women continue to climb the corporate ladder (Tyson, 2003). Research suggests, however, that men and women still take different positions on the labor market: Women work in different occupations, their jobs are at lower levels in the organizational hierarchy, and they earn less money than their male counterparts (UN Development Programme, 2009; U.S. Department of Labor, 2011). For instance, in 2009, women only held 13.5% of the Executive Officer positions at Fortune 500 companies (Soares, Carter, & Combopiano, 2010), and women who are in high positions earn less than their male counterparts (e.g., Hegewisch & Liepmann, 2010; Munoz-Bullon, 2010).

Pay is a major aspect of gender discrimination, and many studies cite data describing gender-based pay-differentials. Although the earnings gap between men and women narrowed between 1979 and 2010, in 2010, median weekly earnings of full-time working women were 81% of the median weekly earnings of their male counterparts in that year (Hegewisch & Liepmann, 2010; U.S. Department of Labor, 2011). Young women and men (from 16 till 24 years) had fairly similar earnings, but in the older age groups, women's earnings were lower than men's (U.S. Department of Labor, 2011).

This comparison is on a broad level, however, and does not control for other factors that might explain this difference. In fact, in field studies, it is impossible to directly attribute gender differences in earnings to discrimination, because these differences may always be caused by unmeasured productivity-related factors (Rynes & Gerhart, 2000). Indeed, some research suggests that little or no gender pay

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gap exists when pay is adjusted for industry, job-level, years of employment, hours worked, education level, and other productivity factors (e.g., Baker, Wendt, & Slonaker, 2002; CONSAD Research Corporation, 2009; Forret & Dougherty, 2004; Kirchmeyer, 1998; O'Neill & O'Neill, 2005).

One way to examine whether gender-based pay differences exist, is to focus on specific groups of working men and women, for which at least some of the alternative explanations for the gender-wage gap can be excluded (Fishback & Terza, 1989; Kunze, 2005, 2008; Tomaskovic-Devey & Skaggs, 2002; Weichselbaumer & Winter-Ebmer, 2005). Therefore, the present study examines the impact of gender and age on earnings within one occupational group. Specifically, we examine gender differences in the earnings of Hollywood's most popular movie stars.

We chose to focus on top movie stars for a number of reasons. First, movie acting was one of the first high-status, high-income occupations that achieved high levels of gender integration (Bordwell, Staiger, & Thompson, 1985; Dean, 2008), and the movie industry used to pay men and women equally well (Dean, 2008; Lincoln & Allen, 2004). Second, since the demise of the studio system (i.e., stars signed long-term contracts with a studio, which set in place their salaries for longer periods of time), stars have been essentially free agents whose salaries reflect their market value (Ravid, 1999). Third, male and female (top) actors are a homogeneous group, as they fulfill the same jobs, within the same industry, at the same time and in the same location (Dean, 2008). Hence, factors that relate to sex segregation of the labor market can be ruled out as explanations for possible gender-wage differences (Bielby & Bielby, 1996). Fourth, the time and energy that male and female actors spend on acting to shoot a film is roughly equal, which excludes the possible influence of work hours and other productivity-related factors. Fifth, although the movie industry is very concerned with profit (Cleve, 2006; Pokorny & Sedgwick, 2010; Ravid, 1999), research has indicated that stars play no role in the financial success of a film (e.g., De Vany & Walls, 1999; Elberse, 2007; Hennig-Thurau, Houston, & Walsh, 2007; Ravid, 1999), which suggests that possible sex differences in profitability of movie stars cannot explain possible gender differences in earnings.

A final, but no less important, reason to focus on Hollywood's most popular movie stars is the relationship between film and culture and the societal impact of top movie stars. The movie industry attracts enormous attention (Faulkner & Anderson, 1987) and has "a disproportional impact on American (and perhaps world) culture" (Eliashberg, Elberse, & Leenders, 2006, p. 638). Media outlets gladly report on Hollywood movie stars and the latest happenings in their lives (Faulkner & Anderson, 1987; Gitlin, 1998), and the astronomical salaries paid to them attract considerable public attention (Liu, 2010). How male and female actors are compensated not only provides insight into a unique but central element of American culture, but also colors the images of men and women "consumed by a global audience" (Bielby & Bielby, 1996, p. 267). Moreover, factors that influence payment to movie stars are believed to influence compensation packages for other top performers, such as athletes, academics, and executives (Chisholm, 2004).

We begin with positioning the focus of this study with a description of the impact of Hollywood films and movie stars on people's lives. We then discuss extant theory and research on the gender-wage gap, and develop our main hypotheses regarding the relationship of movies stars' gender and age with their average earnings per film. We test our hypotheses with a sample of movie stars who played leading roles in one or more movies between 1968 and 2008.

Movies, Movie Stars, and Culture

The motion picture industry relies heavily on top movie stars (Albert, 1998; Basuroy, Chatterjee, & Ravid, 2003) and studios are willing to pay them large sums of money for acting in their movies to increase the chances on making financially successful movies (Albert, 1998; Chisholm, 2004; Vogel, 2007). However, most movies have "short and unpredictable lives" (De Vany & Walls, 1997, p. 784) and only a few movies are financially successful (e.g., Hennig-Thurau et al., 2007; Vogel, 2007). And, despite the fact that the *expected* profit of a movie featuring a movie star is higher than the *expected* profit of a non-star movie (De Vany & Walls, 2004; Elberse, 2007), in reality, star movies are not more profitable than non-star movies (e.g., Elberse, 2007; Ravid, 1999; Walls, 2009). Neither success nor failure of a film can be attributed to the starring actor (Albert, 1999). Star participation does not influence spectator expectations regarding the quality of a film or spectator intentions to recommend that film to others (Suarez-Vazquez, 2011). Furthermore, star presence does not positively influence a film's box office revenues or profitability (e.g., De Vany & Walls, 1999; Hennig-Thurau et al., 2007; Ravid, 1999; Suarez-Vazquez, 2011). In fact, research indicates that movie stars are paid more than the market value they create (Skilton, 2009).

Nevertheless, superstars—that is, the relatively small number of people who "earn enormous amounts of money and dominate the activities in which they engage" (Rosen, 1981, p. 845)—are increasingly important in modern society (Gitlin, 1998). Newspapers and popular magazines often devote numerous pages to celebrity news (Treme & Craig, 2013), newsstands are packed with celebrity-focused offerings (Kurzman et al., 2007; Leets, Debecker, & Giles, 1995), and a wide variety of Internet sites report information regarding Hollywood movie stars (Lee & Gillen, 2011).

The media are part of a process of cultural reproduction. Their content consists not only of information or opinion but also implicitly assumes the legitimacy of a certain type of

political system, and may contain implicit assumptions about acceptable or desirable lifestyles (Philo, 1990). According to Giles (2003), "The influence of the media on everyday behavior is so insidious that it has been impossible to dispel it completely" (p. 11). Likewise, McQuail (1977) argues: "The media work most directly on consciousness by providing the constructed images of the world and of social life and the definitions of social reality" (p. 76). As role models and heroes, movie stars—and their career success—may thus exert considerable influence on the beliefs, values, and norms of their (mainly young) audience (Fraser & Brown, 2002). Moreover, income is a symbol of what society values (Judge & Cable, 2011). Hence, by observing how male and female movie stars fare in the labor market, we learn about what is valued in our society. Therefore, it is important to study the careers of movie stars, and the influence of gender and age on their extrinsic career success.

The Gender-Wage Gap

Literature on the gender-wage gap shows great variation in reported wage-gap estimates (Weichselbaumer & Winter-Ebmer, 2005). Hence, although most people acknowledge the existence of a gender-wage gap, there is no consensus regarding its actual magnitude (Jarrell & Stanley, 2004; Stanley & Jarrell, 1998). Different estimates of the gender-wage gap may stem from differences in how researchers calculate wage rates and differences in the scope of explanatory factors considered. Estimates of the magnitude of gender discrimination are considerably smaller in studies where wage-related variables such as years of employment, hours worked, education level, and other productivity-related factors are included (e.g., Baker et al., 2002; Kunze, 2008; Stanley & Jarrell, 1998; Weichselbaumer & Winter-Ebmer, 2005). Indeed, some researchers have argued that when all productivity-related characteristics are included, the unexplained proportion of the gender earnings gap is either minimal ("Is There Really Still a Gender Pay Gap?" 2000) or nonexistent (Jacobsen, 1994).

Explanations for the Gender-Wage Gap

Determinants of pay can be assessed using either direct or indirect methods. Researchers who use *direct* methods usually conduct experimental studies to examine what information people use in compensation decision making. Direct studies have shown that compensation decisions are based primarily on employee performance and productivity (e.g., Giacobbe-Miller, Miller, & Victorov, 1998; Sherer, Schwab, & Heneman, 1987) and are also influenced by current market wages (e.g., Rynes, Weber, & Milkovich, 1989). Overall, direct studies have shown very little evidence of gender-based discrimination (Mount & Ellis, 1987; Rynes et al., 1989). Researchers who use *indirect* methods infer pay determinants by correlating actual salary distributions with organizational, supervisory, or employee characteristics (Rynes & Bono, 2000). Indirect (also called inferential) studies usually do suggest gender differences in earnings (see also Rynes & Bono, 2000).

Explanations for the gender-wage gap mainly focus on (a) the segregation of the labor market, that is, the concentration of specific groups of workers in specific industries and occupations, with disadvantaged groups (e.g., women) predominantly working in jobs that have lower status, lower pay, and less stability (Gauchat, Kelly, & Wallace, 2012); (b) women's self-confirming expectations that they have fewer career opportunities than men because of discriminatory practices, which may induce them to change their career choices and decrease their investements in human capital and thus, their future careers (Breen & Garcia-Penalosa, 2002; Filippin & Ichino, 2005); (c) women's lower effectiveness in negotiations over salary (Gerhart, 1990; Gerhart & Rynes, 1991), opportunities, and positions of status than men (e.g., Stuhlmacher & Walters, 1999); and (d) stereotypes and discrimination against women in the workplace (e.g., Jarrell & Stanley, 2004; Stanley & Jarrell, 1998).

Studies on statistical gender discrimination usually assess the incremental effects of gender on career outcomes by controlling for relevant individual and job-related factors (Tharenou, 1997). The standard practice is to decompose the wage difference into a productivity component (i.e., the portion attributable to differences in endowments) and an unexplained component, often attributed to wage discrimination (Fishback & Terza, 1989; Kunze, 2008; Stanley & Jarrell, 1998). However, the unexplained component mismeasures discrimination, because proxies for productivity are inaccurate (Fishback & Terza, 1989; Weichselbaumer & Winter-Ebmer, 2005). Therefore, inferential procedures can never conclusively demonstrate discrimination in pay setting practices (e.g., Rynes & Bono, 2000).

In the present study, we examine the "unexplained component" directly, by comparing the earnings of male and female top movie stars. Hollywood top movie stars comprise an interesting sample for investigating the gender-wage gap, because the productivity component can be ruled out. Also, given the focus on a specific profession within an industry, factors related to sex segregation of the labor market are excluded. Male and female top movie stars do not differ in human capital as they have comparable work-experiences and equally invest their time in a movie. Gender differences in pay negotiations are highly unlikely, as movie stars usually have high-powered help from agents, managers, and/or other deal-making experts (Vogel, 2007). Furthermore, as we argued before, stars play no positive role in the financial success of a film (e.g., Hennig-Thurau et al., 2007; Ravid, 1999; Sedgwick & Pokorny, 1999), which eliminates possible sex differences in profitability of movie stars as an explanation for observed gender differences in earnings.

However, there is some controversy regarding the prevalence of gender biases in Hollywood (Bielby & Bielby, 1996; Liu, 2010). For instance, in the movie industry, beliefs that female movie stars have lower star power than male movie stars (De Vany & Walls, 1999), that female leads fail to attract moviegoers (Treme & Craig, 2013), and that female movie stars cannot successfully carry big budget movies (Bielby & Bielby, 1996) prevail.

One demographic factor that may play a role in gender differences in movie stars' earnings is age, as some evidence suggests age-related gender inequalities in the careers of movie stars (e.g., Dean, 2008; Lauzen & Dozier, 2005; Lincoln & Allen, 2004; Simonton, 2004). For instance, female movie stars are on average 6 years younger when they enter the industry (Lincoln & Allen, 2004) and on average, they win awards at younger ages than their male counterparts (Gilberg & Hines, 2000; Lincoln, 2007). Moreover, there are fewer lead roles for older female actors (Lincoln & Allen, 2004; Treme & Craig, 2013) and the roles for older female actors are less appealing than roles for older male actors (Simonton, 2004).

This evidence is in line with literature on aging, which suggests that there are double standards of aging for men and women, with older women being more harshly evaluated than older men (Cruikshank, 2003; Kite, Deaux, & Miele, 1991). Although many studies have examined the impact of workers' gender on earnings, there are only limited studies that relate workers' age or the interaction of gender and age with earnings (Goldberg, Finkelstein, Perry, & Konrad, 2004). One study that examined the combined effects of gender and age on earnings revealed that in a heterogeneous sample of lower level employees, both employees' gender and age related to their earnings (Barnum, Liden, & Ditomaso, 1995). When the interaction of gender and age was added to the regression equation, gender was no longer related to earnings, age was positively related to earnings, and the interaction of gender and age was significantly related to earnings, such that by the age of 35, male workers earned significantly more than their female colleagues. Another study examined the impact of gender and age on the earnings of a heterogeneous sample consisting of MBA alumni (Goldberg et al., 2004). Results indicated that men out-earned women and that pay levels increased with age, but only for men. In the current study, we extend this line of research by examining gender differences in earnings and the role of age in the development of earnings in a homogeneous sample. We propose,

Hypothesis 1: Male movie stars have higher average earnings per film than female movie stars.

Income increases with the accumulation of experience, status, and recognition (Gabris & Mitchell, 1988; Merton, 1964; Ng & Feldman, 2010), and thus with age. Hence, we propose,

Hypothesis 2: Movie star age is positively related to average earnings per film.

In the labor market, the gender-wage gap increases in the older age groups (Barnum et al., 1995; Goldberg et al., 2004) due to productivity factors, the sex segregation of the labor market, and sex differences in the accumulation of human capital. We argued that these factors do not apply to our sample. Nevertheless, we do expect that the relationship between age and earnings differs for male and female actors, due to double standards of aging.

Aging

People often categorize others on the basis of their age. This categorization affects how they perceive the others and relate to them (e.g., Katz, 2002). Age-based perception, stereotyping, and discrimination are part and parcel of ageism. Stereotypes of the elder include characteristics such as ill, depressed, and unproductive (Thornton, 2002). Age has a different social meaning for women and men. Research has indicated that people hold different beliefs about older men and women, and that they evaluate older women more harshly than older men (e.g., Cruikshank, 2003). For instance, they believe that women reach the prime of their lives earlier than men (Zeppelin, Sills, & Heath, 1987), consider women to be middle-aged or old at a younger age then men (Kogan, 1979), and believe that older women are more likely to be wrinkled than older men (Kite et al., 1991). Also, the attractiveness of both men and women decreases with age, but the decline is greater for women than for men (Deutsch, Zalenski, & Clark, 1986).

Physical attractiveness has an important impact on people's life experiences, and research suggests that less attractive individuals are at a disadvantage in the job market (Hosoda, Stone-Romero, & Coats, 2003). Moreover, there seems to be a relentless emphasis on appearance that is harsher on women than on men. For example, men's well-worn faces are thought to convey maturity, character, and experience. A woman's face, on the other hand, is valued for appearing young (Cruikshank, 2003).

There is evidence that for female actors (more so than for male actors) attractiveness and age play important roles (e.g., Lincoln & Allen, 2004). For example, female Academy Award winners are on average much younger than male Academy Award winners (Markson & Taylor, 2000). Hence, we propose,

Hypothesis 3: Gender moderates the positive relationship between age and average earnings per film, such that the earnings of female movie stars decrease after the age they have the highest average earnings per film, whereas the earnings of male movie stars remain stable after they reach the age they have the highest average earnings per film.

Method

Sample

The sample consisted of 265 male (168) and female (97) Hollywood movie stars, who all had had at least one leading role in a movie between 1968 and 2008, and for whom information regarding their earnings was available. To establish a consistent data set, we only included movies in which the actor had an on-screen appearance and that were produced in the United States. Mean age in the year of earning was 38.67 (SD = 11.26). The average movie star had appeared in 22.67 (SD = 13.38) movies before playing in the movie we included in our data set. The appendix provides an overview of the movie stars included in our sample and their age while earning the salary we included in our data set.

Procedure

We conducted an online search for movie star salaries, which resulted in several sources. The data were drawn mainly from the Internet Movie Database (www.IMDb.com), a proprietary database of the entertainment business that includes information on box office ticket sales, production schedules, film budgets, and actor salaries. In addition, we searched a variety of other sources, including *Forbes, Variety, Entertainment Weekly, People*, and *Premiere* and other sources that report movie stars' salaries. This search resulted in additional data from multiple websites. On completing the Internet search, we always entered a movie star's most recent movie for which information regarding earnings was available. Control measures included in our analyses were also drawn from Internet sources.

Measures

Age. Movie stars' age when earning the salary we included in our data set was determined by subtracting the year of earnings from their year of birth, which we found on the website www.variety.com. This website contains a comprehensive list of celebrities and their birthdays. For those movie stars not listed on Variety.com, we were able to find their year of birth on The Internet Movie Database (www.imdb.com).

Gender. Using Variety.com, we determined whether movie stars were male or female and entered the data accordingly (1 = male, 0 = female).

Earnings. For each movie star, we took the most recent year that a salary was reported and entered it into the data set. In some cases, a movie star appeared in more than one film in a given year. We then calculated the movie star's average salary for the most recent year in which data were available. Because salary and earning variables are skewed, we transformed the earnings variable by taking the natural log.

We added several control variables that may have an impact on movie stars' earnings. Information regarding these variables was retrieved from IMDb.com and the other sources we used to collect data regarding movie stars' earnings.

Star presence. A major determinant of movie stars' earnings is the importance of their role in a film: Whether they play a leading or a supporting role. The importance of a movie star in a film, the *star presence*, is reflected in the credit ratings: the ranking of actors in the credits for that film. The goal of our study is to examine sex differences in earnings of movie stars and the role of aging in the development of movie stars' salaries. To merely investigate the influence of age and gender, it is necessary to take star presence into account. Following Lincoln and Allen (2004), we computed star presence as the inverse of each actor's ordinal rank in the credits for a particular film. This measure enabled us to determine an actor's status in a given film and is calculated as follows:

$$cr_i = \frac{1}{r_i},$$

where r_i is the actor's rank among the credits for a given film and cr_i is the credit status of the actor for that film (Lincoln & Allen, 2004).

Number of films and leading roles. To control for the work experience of movie stars, we counted the number of films they had appeared in before the movie we included in our data set and the number of leading roles that each individual had during this period. Due to the high correlation between number of previous leading roles and number of previous roles (r = .81, p < .001), we decided to use the number of previous roles and the proportion of these roles that were leading roles as control variables. The correlation between the total number of previous movies and the percentage of lead roles was .29 (p < .001).

Award nominations and wins. We also measured the number of Academy Award and Golden Globe award nominations and wins in either the Actor, Supporting Actor, Actress, or Supporting Actress categories the movie stars' received before the movie we included in our data set. We counted (a) the number of Academy Awards won, (b) the number of Academy Award nominations that did not result in winning the award, (c) the number of Golden Globes won, and (d) the number of Golden Globe nominations that did not result in winning the award. We then added up these four scores to form an index of overall award nominations and wins. Correlations between the four scores ranged from r = .52 to r = .75 (all ps < .001) and Cronbach's alpha of this composite score was .79.

Results

Means, standard deviations, and zero-order correlations are shown in Table 1. We conducted a curvilinear regression

Table 1. Means, Standard Deviations, and Intercorrelations of Study Variables (N = 265).

Variable	*M*	*SD*	1	2	3	4	5	6	7	8
Age[a]	38.67	11.26	—							
Gender[b]	0.63	0.48	.26	—						
Star presence	0.76	0.31	.11	.14	—					
Award nominations and wins	2.94	4.32	.56	−.08	.13	—				
Number of previous roles	22.67	13.38	.63	.16	.09	.45	—			
Proportion of leading roles	32.88	19.93	.33	.31	.39	.34	.29	—		
Year	1,998.51	7.24	−.06	.02	.03	−.01	.24	.01	—	
Average earnings per film[c]	6,591,033.96	6,764,959.81	.30	.21	.30	.23	.39	.48	.41	—

[a]Age during year of earnings.
[b]For gender, 1 = *male*, 0 = *female*.
[c]Average earnings per film are in U.S. dollars. All values greater than .12 are significant at $p < .05$.

analysis with the natural log of average earnings per film as the dependent variable (M = 14.97, SD = 1.56) to test our hypotheses. In the first step, we entered the control variables year the movie was produced, number of previous roles, proportion of lead roles, award nominations and wins, star presence, and the independent variables gender, age, and age^2 into the regression equation. In the second step, we added the interaction terms Gender × Age and Gender × Age^2 to the regression equation. To avoid multicollinearity, all continuous independent variables were mean-centered. Unstandardized regression coefficients, standard errors, and standardized coefficients are presented in Table 2.

As shown in Table 2 (Step 1), the control variables year ($\beta = .48$, $p < .001$), number of previous roles ($\beta = .14$, $p < .05$), proportion of leading roles ($\beta = .26$, $p < .001$), and star presence ($\beta = .12$, $p < .05$) all significantly relate to average earnings per film. Gender does not relate to earnings ($\beta = .05$, $p = .32$). Hence, Hypothesis 1 is not supported. The linear relationship between movie star age and average earnings per film is not significant ($\beta = .12$, $p = .08$), but age^2 negatively relates to movie stars earnings ($\beta = -.18$, $p < .001$), which implies that the relationship between age and average earnings per film is curvilinear (inverted U-shaped). Hence, Hypothesis 2 is not supported.

The addition of the interaction terms Gender × Age and Gender × Age^2 in the second step of the analysis results in a significant improvement of the model fit ($\Delta R^2 = .04$), $F_{change}(2, 254) = 11.16$, $p < .001$. Overall, the full model explains 52.9% of the variance in average earnings per film. Gender moderates the linear ($\beta = .41$, $p < .001$) and curvilinear ($\beta = .43$, $p = .001$) effects of age on average earnings per film. Simple slope computations revealed that for female movie stars the negative (t = -2.68, $p < .01$) and for male movie stars the positive ($t = 2.36$, $p < .05$) linear relationship between age and average earnings per film is significant. Simple slope analyses for the curvilinear interaction effect (see Figure 1) showed that for female movie stars, the curvilinear trend was positive 1 *SD* below ($t = 3.44$, $p < .001$) and negative 1 *SD* above ($t = -4.71$, $p < .001$) the mean age. For male movie stars, the curvilinear trend was positive 1 *SD* below ($t = 2.77$, $p < .001$) the mean age, but not significant 1 *SD* above ($t = .21$, $p = ns$) the mean age.

Table 2. Regression Predicting Average Earnings per Film.

	Average earnings per film		
Variable	$\hat{B}$	*SE* $\hat{\beta}$	$\hat{\beta}$
Step 1			
Year	.102	.010	.476**
Number of previous roles	.017	.007	.142*
Proportion of lead roles	.020	.004	.262**
Award nominations and wins	.023	.022	.064
Star presence	.602	.247	.119*
Gender[a]	.164	.165	.051
Age[b]	.017	.009	.121
Age^2	−.001	.000	−.181**
Step 2			
Year	.103	.010	.479**
Number of previous roles	.013	.007	.115
Proportion of lead roles	.020	.004	.254**
Award nominations and wins	.051	.022	.141*
Star presence	.497	.240	.098*
Gender[a]	.071	.187	.022
Age[b]	−.042	.016	−.301**
Age^2	−.005	.001	−.631**
Age × Gender interaction	.067	.016	.405**
Age^2 × Gender interaction	.004	.001	.431**

Note. $R^2 = .488$, $F(8, 256) = 30.461$, $p < .001$ for Step 1; $R^2 = .529$, $F(10, 254) = 28.536$, $p < .001$ for Step 2 ($\Delta R^2 = .04$), $F_{change}(2, 254) = 11.162$, $p < .001$. Average earnings per film in U.S. dollars was transformed by taking the natural log.
[a]Gender is coded male = 1, female = 0.
[b]Age during year of earnings. $\hat{B}$ = unstandardized coefficient predicting ln(earnings), $\hat{\beta}$ = standardized coefficient predicting ln(earnings).
*$p < .05$. ** $p < .01$, two-tailed.

Further analyses revealed that female movie stars have their highest average earnings per film when they are 34.47 years of age. Male movie stars have their highest average earnings per film when they are 51.17 years of age. The maximum point of a curvilinear function is reached where the tangent line of the curve has a simple slope equal to zero

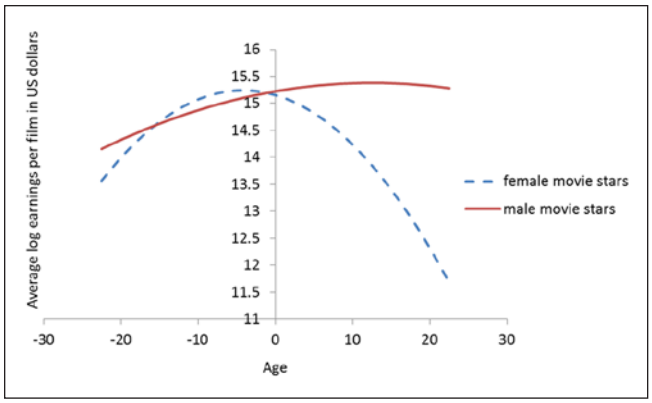

Figure 1. Interactive effect of gender and age^2 on average log earnings per film.

(Aiken & West, 1991). Because male movie stars' highest earnings occur more than 1 *SD* above the mean age, we performed an additional simple slope analysis 2 *SD*'s above the mean to explore whether the earnings of male movie stars decline after the age of their highest earnings. Results ($t = -1.03$, $p = ns$) indicated, however, that this is not the case: For male movie stars, average earnings per film do not decrease after reaching the age they earn the highest average earnings per film.

Together, these results confirm Hypothesis 3. The average earnings per film of female movie stars decrease significantly after they reach the age of their maximum average earnings per film. Specifically, average earnings per film decrease after they reach the age of 34.47. For men, the average earnings per film remain stable after their 51st birthday, when they reach the age of their maximum average earnings per film.

Discussion

We used a detailed micro-level approach to examine possible gender differences in movie stars' average earnings per film and the role of aging in the development of movie stars' salaries. The results of our study showed that aging has a different impact on the earnings of male and female movie stars. Average earnings per film of female movie stars increase until the age of 34, but decrease rapidly after that. For male movie stars, average earnings per film are highest when they are 51 years of age. Growing older than 51 does not negatively affect their average earnings per film. Our findings also showed that men and women have comparable salaries in the beginning of their careers, which is in line with the research findings on the general labor market (U.S. Department of Labor, 2011).

The main contribution of this study does not merely lie in its research findings, but also in the method and sample used in this study. The standard practice of measuring the magnitude of wage discrimination is to use a broad sample of working people, and to break down the observed gender-wage gap into a productivity component, attributable to differences in endowments or skills, and an unexplained component, which is often attributed to wage discrimination (e.g., Stanley & Jarrell, 1998; Weichselbaumer & Winter-Ebmer, 2005). Most researchers use regression models to estimate the effects of differences in productivity-related factors and discrimination. However, several researchers have raised doubts concerning the validity of regression-based methods for estimating the effects of discrimination. "Wage decompositions cannot yet determine accurately how large a role sex discrimination plays in the workplace. Plausible estimates offer too large a range to be comfortable with any point estimates" (Fishback & Terza, 1989, p. 283). Fishback and Terza (1989) suggest that the way to improve accuracy is "detailed micro-level work" within firms or departments within firms. The strength of this study is that we took such a detailed micro-level approach, by examining gender-based wage differentials within the same industry, occupation, and job-level. Thereby, we were able to rule out occupational segregation and gender differences in specialized human capital as possible explanations for the evidenced gender difference in Hollywood top movie stars' earnings.

Our sample consists of Hollywood's top movie stars, who in essence are free agents, and whose salaries reflect their market value (Ravid, 1999). Our results suggest that, as they grow older, male movie stars' market value increases until they reach the age of 51, after which age their value remains stable. The market value of female movie stars decreases much earlier in their lives, around their 34th birthday. As both male and female movie stars' jobs consist of portraying a character as well as they can, the gender difference in earnings of older top movie stars may imply that less value is attached to the work of older female actors than to the work of older male actors. This finding is consistent with the widespread conviction that female movie stars do not attract spectators and cannot successfully carry big budget movies (Bielby & Bielby, 1996; Treme & Craig, 2013). However, one study that actually examined the combined effect of gender and age on box office performance revealed that casting a female lead older than 32 years of age does not influence a movie's box office performance, whereas casting a male lead older than 42 *decreases* box office revenues by almost 17% (Treme & Craig, 2013).

In our society, movie stars are the heroes, idols, and role models who guide adolescents toward adult life (Giles, 2003), and they play an important role in the formation of adolescents' self-concept and identity (Adams-Price & Greene, 1990). Therefore, the gender-wage gap that exists for male and female movie stars may easily be accepted as legitimate and fair, and the different value that seems attached to the work of older men and women may have an impact on the self-concept and identity of the men and women in our society.

This study has several limitations that should be noted. First, although popular media report happily on the personal

and professional affairs of top movie stars (Faulkner & Anderson, 1987; Gitlin, 1998; Liu, 2010), information regarding star salaries is hard to get (Gumbel, Lippman, Bannon, & Orwall, 1998, cited in Ravid, 1999). As a consequence, we used indirect measures of earnings as they were published on the Internet instead of direct measures. Moreover, unavailable earnings data restricted the size of our population and the sample size is relatively small, especially given the large number of movies produced each year. The limited availability of earnings data only allowed us to use a single year of earnings for each of the movies stars in our sample. Hence, we were able to measure the combined influence of movie stars' gender and age on their average earnings per film cross-sectional, but not longitudinal. Although we consider the sample size and the cross-sectional nature of our data to be a limitation, the fact that each movie star is only represented by one data-point also reduces the extent to which a single movie star influences the research findings. To further our insights in the combined effects of gender and age on the income of Hollywood movie stars, it would be interesting to conduct a longitudinal within-individual study.

A second limitation is the relatively small number of female movie stars in our sample who acted in a movie when they were above the age of 45. Although this observation reflects the fact that there are fewer roles available for older female movie stars than for male movie stars (e.g., Lincoln & Allen, 2004; Treme & Craig, 2013), the relatively small number of female movie stars above the age of 45 may limit the reliability of the steepness of the decline in earnings for these female movie stars.

A third limitation is that our study does not provide insight in *why* gender differences in the earnings of top movie stars exist. One possibility is that because there are fewer roles available to female than to male actors as they grow older (Dean, 2008; Treme & Craig, 2013), female movie stars may experience more competition in the process of obtaining a role and settle for less money than their male counterparts (Tyson, 2003). A second possibility is that because men give greater importance to money and prestige than women (Fortin, 2008), they are more inclined than women to (have their manager) negotiate for the highest salary possible. A third option is that because women feel less entitled to top salaries, they demand less during the negotiation process than do men (Babcock & Laschever, 2003). Finally, different value may be attached to the work of older men and women, even though they perform exactly the same jobs and deliver the same quality of work. Lips (2003) gives an example of the devaluation of women's work. She showed that female writers were less likely than male writers to be awarded the high-prestige Pulitzer literary prize. In a similar vein, since 1901, only 12 Nobel Prizes in literature have been awarded to female writers. Future research should examine the underlying mechanisms of the gender differences in earnings for older male and female movie stars. One way to gain deeper insight in the development of career outcomes of male and female movie stars would be to compare earnings on synchronous movies (Lincoln, 2007). That is, by only comparing male and female movie stars' earnings on first movies with first movies, on second movies with second movies, and so forth. Furthermore, research has indicated that in organizational settings, women have less access to informal networks that enhance individuals' careers than men (e.g., Morrison & von Glinow, 1990) and that men's careers benefit more informal social networks than women's careers (Forret & Dougherty, 2004). Hence, studying movie stars' network ties and how these ties affect their career outcomes might be another avenue for further research (Lincoln, 2007).

Another issue that warrants attention relates to the representativeness of our sample for the labor market at large. The movie industry is characterized by project-oriented employment. Movie stars are employed for the duration of a single film (Faulkner & Anderson, 1987; Shamsie, Martin, & Miller, 2009), of which the financial success is almost impossible to predict (De Vany & Walls, 1996; Faulkner & Anderson, 1987). Within this industry, top movie stars are essentially free agents whose salaries reflect their *expected* market value (Ravid, 1999). More traditional industries, however, are still largely characterized by long-term employment relationships, where salary and hierarchical advancement often depend on *actual* job performance and organizational tenure (De Pater, Van Vianen, Bechtoldt, & Klehe, 2009). Given the lack of solid information regarding the factors that are responsible for the financial achievements of movies (Shamsie, 2006), hiring and compensation decisions made by studio executives are likely to be highly subjective and to be based on ambiguous knowledge. Hence, stereotypes and biases regarding the added value of especially older women may have more impact in the movie industry than in more traditional labor markets. However, many industries and occupations have their own superstars, that is, a relatively small number of people who dominate the activities they engage in and earn incredible amounts of money compared with others in the same field (Rosen, 1981). The careers of these superstars (i.e., athletes, academics, corporate officers, executives, writers, musicians, trainers, and managers, etc.) often resemble the careers of movie stars, in that they are usually contracted for a restricted period of time or for a specific assignment, and earn salaries that reflect their expected market value. Thus, gender and age stereotypes may also affect the earnings of these professionals. This suggestion is supported by research that indicates that female top-executives are paid less than their male counterparts (Hegewisch & Liepmann, 2010; Munoz-Bullon, 2010). Future research should examine the combined impact of gender and age on the earnings of superstars in other occupational fields and the labor market at large.

Although the gender-wage gap has attracted much attention from researchers, the combined impact of gender and

age on the earnings of men and women has hardly been addressed before. Those studies that addressed this issue mainly focused on the gender-wage gap in traditional labor relations, using heterogeneous samples. Our study is one of the first to address the age-related gender-wage gap among a highly homogeneous sample of men and women in an industry where workers are essentially free agents. Future research should attempt to replicate our findings in other micro-level samples, such as self-employed individuals in specific fields, top-executives, top-academics, athletes, and top-selling authors. Furthermore, our study indicates differences in the average earnings per film of male and female top movie stars that cannot be explained by industry, profession, job-level, human capital, or other productivity-related factors. Future research should focus on the origins of the "true" gender-wage gap in project-based work settings: gender discrimination, or gender differences in salary demands or salary negotiations.

Appendix

Movie Stars Included in Study

Name	Age (in year of earnings)
Adam Sandler	37
Aidan Quinn	35
Al Pacino	62
Albert Brooks	47
Alec Baldwin	39
Ali MacGraw	32
Alicia Silverstone	21
Andie MacDowell	38
Andy Garcia	40
Angela Bassett	43
Angelina Jolie	32
Anjelica Huston	40
Annette Bening	40
Anthony Hopkins	65
Anthony Perkins	57
Antonio Banderas	41
Arnold Schwarzenegger	56
Ashley Judd	33
Ben Affleck	34
Ben Stiller	39
Betsy Palmer	55
Bill Murray	43
Bill Pullman	43
Billy Crudup	32
Billy Crystal	50
Brad Pitt	42
Brendan Fraser	33
Brittany Murphy	27
Bruce Willis	52
Bryce Dallas Howard	26
Burt Reynolds	48

(continued)

Appendix (continued)

Name	Age (in year of earnings)
Cameron Diaz	33
Carrie Fisher	27
Catherine Zeta-Jones	31
Charlie Sheen	32
Cher	44
Chevy Chase	49
Chris O'Donnell	26
Chris Rock	33
Chris Tucker	35
Christian Slater	25
Christina Ricci	22
Clint Eastwood	48
Colin Farrell	27
Courtney Cox Arquette	40
Cuba Gooding Jr.	32
Dan Aykroyd	42
Daniel Day-Lewis	39
Daniel Radcliffe	18
Daniel Stern	35
Danny Devito	52
Danny Glove	52
David Arquette	31
David Duchovny	37
Debra Winger	38
Demi Moore	35
Denis Leary	39
Dennis Miller	43
Dennis Quaid	44
Dennis Rodman	36
Denzel Washington	53
Diane Keaton	44
Diane Lane	40
Drew Barrymore	28
Dustin Hoffman	51
Dwayne Johnson	31
Ed Harris	47
Eddie Murphy	41
Edward Norton	34
Elijah Wood	21
Elizabeth Hurley	34
Ellen DeGeneres	38
Emilio Estevez	32
Emma Thompson	35
Ethan Hawke	35
Frankie Muniz	18
Freddie Prinze Jr.	26
Gary Oldman	40
Geena Davis	39
Gene Hackman	66
George Clooney	46
Glenn Close	47
Goldie Hawn	47
Gwyneth Paltrow	31

(continued)

Appendix (continued)

Name	Age (in year of earnings)
Halle Berry	35
Harrison Ford	60
Heath Ledger	24
Helen Hunt	37
Hilary Swank	28
Hilary Duff	17
Holly Hunter	35
Hugh Grant	42
Ian McKellen	63
Ice Cube	28
Jack Black	33
Jack Lemmon	43
Jack Nicholson	65
Jackie Chan	53
Jake Gyllenhaal	25
James Gandolfini	40
James Spader	42
Jamie Lee Curtis	44
Jane Fonda	40
Jason Biggs	23
Jason James Richter	17
Jason Lee	33
Jason Patric	27
Jaye Davidson	26
Jean-Claude Van Damme	34
Jeff Bridges	42
Jeff Daniels	39
Jennifer Connelly	33
Jennifer Garner	32
Jennifer Lopez	35
Jennifer Love Hewitt	22
Jessica Lange	46
Jim Carrey	41
Joaquin Phoenix	31
Jodie Foster	45
Joe Pesci	55
John Belushi	29
John Cusack	31
John Goodman	42
John Hannah	39
John Malkovich	40
John Travolta	53
Johnny Depp	43
Josh Hartnett	23
Jude Law	31
Julia Roberts	36
Julia Stiles	22
Julianne Moore	41
Julie Andrews	35
Kareem Abdul-Jabaar	33
Kate Beckinsale	28
Kate Hudson	25
Kate Winslet	29

(continued)

Appendix (continued)

Name	Age (in year of earnings)
Kathleen Turner	40
Kathy Bates	47
Katie Holmes	27
Keanu Reeves	39
Keira Knightley	22
Kenneth Branagh	38
Kevin Bacon	38
Kevin Costner	47
Kevin Kline	46
Kevin Spacey	39
Kiefer Sutherland	27
Kim Basinger	47
Kirsten Dunst	23
Kurt Russell	50
Laura Dern	18
Laura Linney	36
Leelee Sobieski	18
Leonardo DiCaprio	32
Lindsay Lohan	20
LL Cool J	34
Lucy Liu	35
Luke Perry	27
M. Night Shyamalan	32
Macaulay Culkin	14
Madeleine Stowe	35
Madonna	38
Jena Malone	14
Marisa Tomei	30
Mark Hamill	32
Mark Wahlberg	30
Marlon Brando	70
Martin Lawrence	38
Matt Damon	35
Matthew Broderick	37
Matthew McConaughey	36
Matthew Modine	36
Matthew Perry	29
Meg Ryan	39
Mel Gibson	46
Melanie Griffith	37
Mercedes Ruehl	45
Meryl Streep	57
Michael Douglas	56
Michael J. Fox	33
Michael Keaton	38
Michael Richards	48
Michelle Pfeiffer	42
Michelle Yeoh	35
Mike Myers	39
Mira Sorvino	32
Morgan Freeman	60
Naomi Watts	37
Neve Campbell	31

(continued)

Appendix (continued)

Name	Age (in year of earnings)
Nia Vardalos	40
Nick Nolte	53
Nicolas Cage	40
Nicole Kidman	40
Orlando Bloom	28
Owen Wilson	37
Patricia Arquette	27
Patrick Stewart	62
Patrick Swayze	41
Paul Newman	64
Paul Walker	30
Penelope Cruz	31
Peter Sarsgaard	34
Pierce Brosnan	49
Queen Latifa	35
Rachael Leigh Cook	22
Rachel McAdams	27
Ray Liotta	40
Reese Witherspoon	27
Rene Russo	45
Renee Zellweger	34
Richard Dreyfuss	44
Richard Gere	53
Richard Pryor	43
Rob Schneider	38
Robert De Niro	61
Robert Duvall	43
Robert Redford	65
Robin Williams	48
Rodney Dangerfield	59
Rosario Dawson	26
Rupert Everett	43
Russell Crowe	39
Ryan Phillippe	27
Samuel L. Jackson	54
Sandra Bullock	38
Sarah Jessica Parker	43
Sarah Michelle Gellar	25
Sean Connery	73
Sean Penn	41
Sharon Stone	48
Shia Labeouf	21
Shirley MacLaine	36
Sigourney Weaver	55
Steve Carrell	45
Steve Martin	58
Steve Zahn	34
Steven Seagal	45
Susan Sarandon	56
Sylvester Stallone	56
Sylvia Kristel	23
Ted Danson	47
Tim Allen	48

(continued)

Appendix (continued)

Name	Age (in year of earnings)
Tobey Maguire	29
Tom Arnold	39
Tom Cruise	41
Tom Hanks	50
Tommy Lee Jones	57
Uma Thurman	35
Val Kilmer	40
Vanessa Redgrave	57
Viggo Mortensen	46
Vin Diesel	37
Vince Vaughn	35
Walter Matthau	77
Warren Beatty	57
Wesley Snipes	42
Whitney Houston	33
Whoopi Goldberg	41
Will Ferrell	39
Will Smith	40
William Baldwin	30
William Lee Scott	28
Winona Ryder	23
Woody Harrelson	34

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