Survival in Academy Award–Winning Actors and Actresses

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Background: **Social status is an important predictor of poor health. Most studies of this issue have focused on the lower echelons of society.**

Objective: **To determine whether the increase in status from winning an academy award is associated with long-term mortality among actors and actresses.**

Design: **Retrospective cohort analysis.**

Setting: **Academy of Motion Picture Arts and Sciences.**

Participants: **All actors and actresses ever nominated for an academy award in a leading or a supporting role were identified ($n = 762$). For each, another cast member of the same sex who was in the same film and was born in the same era was identified ($n = 887$).**

Measurements: **Life expectancy and all-cause mortality rates.**

Results: **All 1649 performers were analyzed; the median duration of follow-up time from birth was 66 years, and 772 deaths occurred (primarily from ischemic heart disease and malignant disease). Life expectancy was 3.9 years longer for Academy Award winners than for other, less recognized performers (79.7 vs. 75.8 years; $P = 0.003$). This difference was equal to a 28% relative reduction in death rates (95% CI, 10% to 42%). Adjustment for birth year, sex, and ethnicity yielded similar results, as did adjustments for birth country, possible name change, age at release of first film, and total films in career. Additional wins were associated with a 22% relative reduction in death rates (CI, 5% to 35%), whereas additional films and additional nominations were not associated with a significant reduction in death rates.**

Conclusion: **The association of high status with increased longevity that prevails in the public also extends to celebrities, contributes to a large survival advantage, and is partially explained by factors related to success.**

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Social status is a consistent, powerful, and widespread determinant of death rates. The association between high status and low mortality has appeared throughout the world, has persisted for more than a century, and extends to diverse illnesses (1–4). Uncovering the mechanisms by which external factors (such as income and level of education) influence biological processes (such as the endocrine and immune systems) represents a major challenge for health scientists and a core issue for public policy. Research is difficult because many determinants of social status are closely interrelated, such as education with income. Animal models are unrealistic, aside from some primate studies, and randomized trials are impractical, aside from a few lottery winners.

Movie stars are an interesting group for the study of social status and health outcomes. First, performers can earn an enormous income without a substantial amount of education. Second, celebrity publicity is often boosted by more sustained promotion than is the attention given to politicians, singers, athletes, and other luminaries. Third, the lifestyles of movie stars can be notorious for extremes of competition, leisure, and excess. Fourth, they are highly visible public figures whose birthdays and deaths are regularly reported. Finally, big breaks to stardom are often haphazard and heavily dependent on chance. Indeed, some pundits suggest that being nominated for an Academy Award is due to talent whereas winning one is due to luck.

We wondered whether the Academy Awards might shed light on how social status affects all-cause mortality. We chose this event because it generates substantial attention; for example, in 1996, almost as many Americans watched the Academy Awards as voted in the presidential election (5, 6). Moreover, the event is televised to more than 100 countries and has an estimated viewing audience of more than 1 billion people, making its broadcast one of the most widely shared current human experiences. Our theory was that winners would gain an important increase in their status but no increase in their formal education. The primary hypothesis was that the survival of winners would differ from that of less recognized performers.

METHODS

Academy of Motion Picture Arts and Sciences

Membership in the Academy of Motion Picture Arts and Sciences is limited by invitation from the

Board of Governors to those with movie distinctions, currently totals about 6000 persons, and has 13 branches (for example, an actors' branch that includes about 1000 persons). The annual awards selection process is complex and is described in detail elsewhere (www.oscars.org). In brief, each December the Academy compiles a list of films that are eligible for an award; each cast member in these films is eligible to be nominated for an acting award. In January, the list is sent to all Academy members and those in the actors' branch are invited to nominate five individuals in each of four acting categories. In February, the nominations are tabulated, the top five nominations in each category are identified, and all Academy members vote for one person in each category. The Academy Award goes to the person with the most votes.

Selection of Performers

We identified every person nominated for an Academy Award for acting. To do so, we obtained a full listing of all actors and actresses, along with the film in which they performed, from the Academy. The selection interval spanned from the inception of the Academy Awards to the present (72 years). For each performer, we also identified another cast member who performed in the same film as the nominee, was the same sex, and was born in the same era. This ensured that both were alive, working, prevailing in casting calls, winning good movie roles, and eligible for a nomination. In cases where several matches were possible, we picked a same-sex cast member by formally checking dates and choosing the one whose birth date was closest to that of the nominated performer.

Example of Matching Process

For clarity, we provide an arbitrary example of this matching process to illustrate the underlying method. Kate Winslet was nominated for the leading actress award in 1997 for her performance as the character Rose DeWitt Bukater in the movie *Titanic*. Five other women were cast members in that film, including Suzy Amis, who performed as the character Lizzy Calvert. Kate Winslet was born in 1975, and Suzy Amis was born in 1961; these two people had a 14-year difference in age. The other four women, Kathy Bates (born in 1948), Frances Fisher (born in 1952), Jenette Goldstein (born in 1960), and Gloria Stuart (born in 1910), all had an age difference greater than 14 years compared to Kate Winslet. Hence, Suzy Amis was selected as the match for Kate Winslet in this film.

Overall Matching Process

We repeated this matching process for all years and all four categories. No performer was excluded from analysis, and no performer was dropped because of missing data. Matches were not possible in some cases; for example, in 1951, Katharine Hepburn was nominated in a movie in which no other woman appeared. Otherwise, the matching process was uncomplicated and complete. In the matching process, we did not attempt to balance ethnicity, past experience, or future accomplishment of the performers. As a consequence, the person who performed opposite the nominee could previously have achieved or subsequently achieve greater recognition. Such potential misclassification might cause analyses to underestimate the differences attributable to winning an Academy Award.

Classification of Success

Many performers were eligible for inclusion on more than one occasion; for example, Katharine Hepburn won four Academy Awards during her career. We counted each person only once by categorizing performers according to their highest achievement. The three groups were termed "winners" (those who were nominated for and won at least one Academy Award), "nominees" (those who were nominated but never won an Academy Award), and "controls" (those who were never nominated and never won). For example, Jack Nicholson was classified as a winner because he had three wins, Richard Burton was a nominee because he was nominated seven times but never won, and Lorne Greene was a control because he was never nominated. Statistical tests based on counting performances rather than performers gave more extreme results and are not shown.

Determination of Death Rates

We collected data on each person's date of birth and death from the Internet through two databases: the All Movie Guide (www.allmovie.com) and the Internet Movie Database (www.imdb.com). Each source covers more than 100 000 movies, is updated continually, and undergoes extensive public scrutiny. Data were checked by consulting written publications, and conflicts were resolved by accepting information from printed sources over that found on the Internet (7–10). No birth dates were missing. Causes of death were sought by using the same methods and by inquiry to the National Film Information Service. In addition, we checked Internet sources that listed people who have sometimes been mistakenly rumored dead. People who were not reported dead were presumed to be alive.

Determination of Personal Characteristics

Additional data were retrieved by using methods similar to those described above, with the following exceptions. Determination of whether the person was born in the United States and whether the person had changed his or her name from the given name was made by using the All Movie Guide. Missing data were assumed to indicate the United States as the country of origin and no change in name. Ethnicity was determined by searching Internet sources and by viewing selected films. Although performers try to avoid being typecast, we classified each performer's main film genre according to that listed first by the All Movie Guide. Similarly, although the ratings given in film reviews are debatable, the All Movie Guide five-star ratings were considered to indicate high quality.

Setting Time-Zero

Research on the natural history of any condition requires identifying people at an early and uniform point in their course. Unstable definitions of "time-zero" might otherwise lead to distorted prognoses, an error called *lead-time bias* (11, 12). The baseline analysis in this study set time-zero as the performer's day of birth to conform to the accepted measure of longevity (13). Other analyses were conducted to test robustness. In the first of these, time-zero was set as the day on which each performer's first film was released. In the second, time-zero was set as the day of each performer's 65th birthday; therefore, all performers who died before 65 years of age were excluded. In the third analysis, time-zero was set as each performer's 50th birthday; all performers who died before 50 years of age were therefore excluded.

Reverse Causality

Survival analysis also requires avoiding artifacts related to survivor treatment-selection bias: That is, persons who are destined to live longer have more opportunity to gain special treatments, thereby potentially creating an illusory link between special treatments and longer survival (14–16). One way to mitigate this bias is to use time-dependent covariates in a proportional hazards model, although doing so can produce a different bias in the opposite direction (17, 18). We analyzed survival both with and without a time-dependent step function for victory. In addition, we analyzed survival after adjusting for total films and total nominations in a person's career to see whether winning an Academy Award was distinct from other exposures that can accumulate over time.

Unmeasured Confounding

We used three strategies to test whether the survival associated with winning an Academy Award might be due to hidden confounding. First, we conducted analyses both with and without adjustments for baseline characteristics, on the rationale that if partial control based on available factors yielded only a small difference in estimates, then perfect control based on ideal factors would be less likely to yield a large difference in estimates. Second, we repeated all analyses by comparing winners with nominees and tested whether the survival difference persisted, on the rationale that nominees were intermediate between winners and controls in talent or other unknown factors. Third, we examined dose–response gradients by assessing survival in performers with multiple wins.

Statistical Analysis

The primary analysis compared mortality in Academy Award winners and controls. Survival was plotted by using the Kaplan–Meier method, life expectancy was estimated as the area under the curve, and comparisons were done by using the log-rank test. Regression analyses used the Cox proportional hazards model to adjust for birth year, sex, ethnicity (white or nonwhite), birth country (United States or other), name change (yes or no), age at release of first film, and total films in career. Continuous covariates were coded as linear terms (models with quadratic and cubic terms yielded similar results

Table 1. **Baseline Characteristics***

Characteristic	Winners (n = 235)	Nominees (n = 527)	Controls (n = 887)
	←———	%	———→
Birth year			
Before 1900	14	15	17
1900–1919	33	18	28
1920–1939	28	34	30
1940–1959	19	24	19
1960–1979	6	8	6
1980–1999	0	0	0
Male sex	50	51	56
White ethnicity	97	96	97
Birth in the United States	69	69	74
Change in birth name	29	23	9
Age at making of first film			
<10 y	2	3	2
10–19 y	15	18	11
20–29 y	51	50	45
30–39 y	26	21	29
40–49 y	5	6	8
≥50 y	1	2	4

* Data may not add to 100% because of rounding.

and are not reported). The proportionality assumption was checked by inspection of log–log plots. Tests were done by using StatView software, version 5.0 (SAS Institute, Inc., Cary North Carolina), and SAS software, version 6.12 (SAS Institute, Inc.). All P values were two-tailed, and those less than 0.05 were considered statistically significant. Our data file is available on the Web site of the Institute for Clinical Evaluative Sciences (www.ices.on.ca).

Role of Funding Sources

The funding sources had no role in the design, conduct, or reporting of this study.

RESULTS

Overall, 1649 performers were nominated for an Academy Award or appeared opposite the nominated performer. The baseline characteristics of winners, nominees, and controls were similar (**Table 1**). In particular, the three groups did not differ greatly in birth year, sex, ethnicity, or country of birth, aside from a trend that nominees were born somewhat more recently than winners or controls. Fewer controls were listed as having a different name at birth, a finding perhaps related to lesser monitoring of this group. The median age at release of first film was 26 years, and almost all performers (98%) had started appearing in films by 49 years of age. The median age at first nomination was 35 years (identical for winners and nominees). Among winners, the median age at first award was 39 years, most (80%) had received an award by 49 years of age, and few (15%) had multiple wins.

Each performer's career was assessed as the interval from their first to their most recent film credit (through the year 2000). On average, winners were in more total films than were nominees (58.9 vs. 47.4; $P < 0.001$). In contrast, nominees and controls had a similar number of total films (47.4 vs. 45.5; $P > 0.2$). Analyses of only films rated four stars or more revealed a similar pattern. For each group, the average performer was in about 1.5 films per year during their career. The most common film genre in each group was "drama," and this was more frequent among winners than controls (82% vs. 72%; $P = 0.003$). Most winners and nominees received a first nomination within two decades of their first film (83% vs. 83%; $P > 0.2$). Among winners, information on level of education was available for 119 performers; half (61 of 119) had only a high school education (excluding honorary degrees).

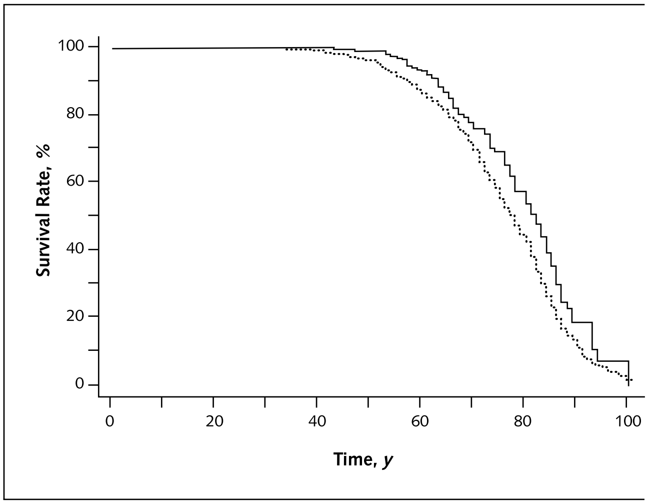
A total of 772 performers had died by 28 March 2000 (median follow-up, 66 years from birth). A specific cause of death was listed for 556 performers and was not listed for 216 performers (**Table 2**). No major imbalances were seen among the three groups in identified causes of death. Ischemic heart disease was the most common cause of death and accounted for 23% of deaths overall (177 of 772 deaths). Injuries and poisoning occurred at all ages and accounted for 6% of the

Table 2. **Causes of Death**

Cause of Death	Winners	Nominees	Controls
	←———	n	———→
Ischemic heart disease	30	44	103
Cerebrovascular disease	9	16	19
Other cardiovascular disease	2	1	6
Malignant disease	30	46	81
Chronic lung disease	4	9	13
Acute pneumonia	6	11	7
Liver failure	0	4	2
Kidney failure	0	5	4
Primary neurologic disorder	2	6	7
Injury or poisoning	5	23	19
Other specified cause	3	20	19
Unspecified cause*	8	36	172
Total	99	221	452

* Includes partial data (for example, "died of natural causes").

Figure. **Survival in Academy Award–winning actors and actresses (*solid line*) and controls (performers who were never nominated) (*dotted line*), plotted by using the Kaplan–Meier technique.**



Analysis is based on log-rank test comparing 235 winners (99 deaths) with 887 controls (452 deaths). The total numbers of performers available for analysis were 1122 at 0 years, 1056 at 40 years, 762 at 60 years, and 240 at 80 years. $P = 0.003$ for winners vs. controls.

deaths overall (47 of 772 deaths). Of the 42 deaths from miscellaneous causes, 15 were due to postoperative complications and 8 were due to AIDS. Overall, almost all deaths (714 of 772) occurred after 50 years of age, and very few deaths (13 of 772) occurred within a decade of the performer's first film. Twenty performers were older than 90 years of age and were still alive at follow-up.

Survival was better among winners than among controls (**Figure**). The overall difference in life expectancy was 3.9 years (79.7 vs. 75.8 years; $P = 0.003$). The difference was similar for men and women (3.8 vs. 4.1 years; $P > 0.2$) but was greater for performers born in or after 1910 than for those born before or in 1909 (4.1 vs. 1.7 years; $P = 0.015$). The difference in life expectancy between winners and controls was 5.9 years (53.2 vs. 47.3 years; $P < 0.001$) in analyses based on survival after release of the first film, 2.5 years (83.0 vs. 80.5 years; $P = 0.018$) in analyses that excluded performers who died before 65 years of age, and 2.3 years (79.4 vs. 77.1 years; $P = 0.028$) in analyses that excluded performers who died before 50 years of age.

The generally lower mortality hazard was equal to about a 28% relative reduction in death rates in winners (95% CI, 10% to 42%). Adjustment for birth year, sex, and ethnicity yielded similar results (**Table 3**). Accounting for birth country, name change, age at release of first film, and total films in career also made no large difference. Excluding performers who died before 50 years of age and those who won an award after 50 years of age yielded a relative reduction of 25% (CI, 2% to 42%), which decreased to 18% (CI, −7% to 37%) after adjustment for birth year, sex, and ethnicity. Analyses using time-dependent covariates, in which winners were counted as controls until the time of first victory, yielded a relative reduction of 20% (CI, 0% to 35%). Analyses excluding performers with multiple wins yielded a relative reduction of 25% (CI, 5% to 40%).

Additional analyses were done to evaluate the 762 performers who received at least one Academy Award nomination. Life expectancy was better for winners than for nominees (79.7 vs. 76.1 years; $P = 0.013$). This was equal to a 25% relative reduction in death rates (CI, 5% to 41%). Adjustment for demographic and professional factors yielded similar results, as did calculations based on time from first nomination rather than time from birth (relative reduction in death rate, 24% [CI, 3% to 40%]). Among winners and nominees, very few deaths

Table 3. **Analysis of Death Rates**

Analysis	Relative Reduction in Mortality Rate (95% CI), %*
Winners compared with controls	
Basic analysis	28 (10–42)
Adjusted for birth year	27 (9–41)
Adjusted for sex	27 (10–42)
Adjusted for ethnicity	27 (10–42)
Adjusted for all 3 demographic factors	26 (8–40)
Adjusted for birth country	27 (10–42)
Adjusted for possible name change	27 (8–41)
Adjusted for age at first film	26 (7–40)
Adjusted for total films in career	27 (9–42)
Adjusted for all 4 professional factors	25 (5–40)
Adjusted for all 7 factors	23 (2–38)
Winners compared with nominees	
Basic analysis	25 (5–41)
Adjusted for birth year	24 (4–40)
Adjusted for sex	27 (7–42)
Adjusted for ethnicity	25 (5–41)
Adjusted for all 3 demographic factors	26 (6–42)
Adjusted for birth country	26 (6–41)
Adjusted for possible name change	26 (6–42)
Adjusted for age at first film	25 (5–41)
Adjusted for total films in career	23 (2–39)
Adjusted for all 4 professional factors	24 (3–40)
Adjusted for all 7 factors	22 (0–38)

* Proportional hazards analysis.

occurred within a decade of their first nomination (4% vs. 5%; $P > 0.2$). Life expectancy was 2.7 years higher for performers with multiple wins than for those with single wins (82.0 vs. 79.3), but the difference was not statistically significant ($P = 0.093$). The award category (leading vs. supporting role) made no significant difference in survival.

Performers with long careers sometimes received more nominations than did those with short careers. The overall association was about 0.02 nomination (CI, 0.016 to 0.024 nomination) per year of career. The winners accumulated a total of 639 nominations, of which 362 were defeats. The nominees accumulated a total of 717 nominations. We found no association between number of defeats and reduced death rates, either for winners (relative reduction in death rate, 5% [CI, −6% to 15%]) or nominees (relative reduction in death rate, 2% [CI, −14% to 16%]). Analyses of winners and nominees together showed that each win was associated with a 22% relative reduction in death rates (CI, 5% to 35%), whereas each nomination otherwise was not associated with a significant reduction in death rates (relative reduction in death rate, 3% [CI, −6% to 11%]).

Other factors were also linked to longevity. Women lived longer than men (77.9 vs. 75.4 years; $P < 0.001$). Performers born in more recent decades also had reduced death rates (relative reduction in death rate, 6% [CI, 2% to 10%]). No other baseline characteristic (**Table 1**) was significantly related to survival. Similarly, total films in career—an indirect measure of income—was unrelated to death rates among winners (relative reduction in death rate, 0.1% [CI, −0.3% to 0.6%]), nominees (relative reduction in death rate, 0.3% [CI, −0.1% to 0.6%]), and controls (relative reduction in death rate, 0.0% [CI, −0.2% to 0.2%]). Age at first award was related to longevity, in that later wins led to smaller gains; for example, life expectancy beyond 50 years of age was greater for those who won in their 30s compared with those in their 40s (32.7 vs. 26.6; $P = 0.007$).

DISCUSSION

We found that winning an Academy Award was associated with a large gain in life expectancy for actors and actresses. The apparent survival advantage amounted to about 4 extra years of life (CI, 1.6 to 6.2 years), could not be explained by simple birth demographics, and was evident even though victory predated death by about four decades. Survival among performers who were nominated but did not win was about the same as that among performers with no nominations. Survival among performers with many nominations was no better than among those with single nominations, unless more nominations generated more wins. Our observations were not easily attributed to occupation, income, talent, random chance, measurement error, or reverse causality. Instead, the results suggest that success confers a survival advantage.

Several explanations might account for the increased survival of Academy Award–winning actors and actresses. Movie stars are often subjected to a personal scrutiny that far exceeds their dramatic achievements. They often need to preserve their image by continually avoiding disgraceful behaviors and maintaining exemplary conduct. They may be surrounded by managers and others who are invested in the person's reputation and can enforce high standards of behavior. They have personal chefs, trainers, nannies, or other staff that make it easy to follow the ideals of lifestyle. Furthermore, a movie star may have more control, ability to avoid stress, self-efficacy, resources, admirers, motivation, and access to special privileges than others in society. The full mechanism of the apparent survival benefit among successful actors and actresses is not known. Untangling the explanations is further complicated because some stars also engage in superstitious and deleterious behaviors.

Causal inferences should take into account possible confounding. Factors might develop before, persist for decades after, and be unaltered by the other effects of winning. These as-yet unidentified factors contribute to both victory and longevity but not to nomination. Such factors are equally important in men and women, are more intense in recent eras, and are unrelated to total films in a career. They predict who will win an Academy Award, will not change with repeated nominations, and do not differ for those in supporting rather than leading roles. Ambition, resilience, time preference, social support, work stress, environmental pollutants, or childhood experience (all of which have been suggested to play a role in survival) do not easily satisfy these conditions, but such factors are not impossible. A factor that was present in 80% of winners and 20% of controls would explain our findings if it created a 6.5-year survival difference.

Our study had two main limitations. First, information on many personal details, such as level of education, is not available for all performers. More biographical work is needed, especially because such factors as smoking and alcohol intake account for only a modest proportion of the social inequities in population mortality (19). Biographical work needs to include more performers than just extraordinary ones, because omitting performers with three or four Academy Awards still showed a 27% difference in survival (CI, 10% to 42%). Second, for some people the sting of defeat is more intense than the joy of victory (20). However, this asymmetry is unlikely to be the only explanatory factor, given that the average lifespan of controls was still much higher than that of the general U.S. adult population during the interval (21). Indeed, the results are surprising because performers sometimes understate their age, which would cause our data to underestimate their survival.

Winning an Academy Award can increase a performer's stature and may add to their longevity. The absolute difference in life expectancy is about equal to the societal consequence of curing all cancers in all people for all time (22, 23). Moreover, movie stars who have won multiple Academy Awards have a survival advantage of 6.0 years (CI, 0.7 to 11.3 years) over performers with multiple films but no victories. Formal education is not the only way to improve health, and strict poverty is not the only way to worsen health. The main implication is that higher status may be linked to lower mortality rates even at very impressive levels of achievement.

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There is plenty of pain that arises from within; this woman with a tumour growing in her neck, plain to feel it under experienced fingers, and then the usual weekly procession of pensioners hobbled by arthritis.

But the pain that comes from without—the violation of the flesh, a child is burned by an overturned pot of boiling water, or a knife is thrust. A bullet. This piercing of the flesh, the force, ram of a bullet deep into it, steel alloy that breaks bone as if shattering a teacup—she is not a surgeon but in this violent city she has watched those nuggets delved for and prised out on operating tables, they retain the streamline shape of velocity itself, there is no element in the human body that can withstand, even dent, a bullet—those who survive recall the pain differently but on all accounts agree: an assault. The pain is the product of the self: somewhere, a mystery medical science cannot explain, the self is responsible. But this—the bullet: the pure assault of pain.

The purpose of the doctor's life is to defend the body against the violence of pain. She stands on the other side of the divide from those who cause it. The divide of the ultimate, between life and death.

Nadine Gordimer
The House Gun
New York: Farrar, Straus, & Giroux; 1998:13

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