Revered Today, Loved Tomorrow: Expert Creativity Ratings Predict Popularity of Architects' Works 50 Years Later

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Beginning in the 1950s, the Institute of Personality Assessment and Research (IPAR) began a program of research to study the psychology of effectively functioning persons. Among the most influential series of studies conducted by IPAR were the assessments of highly creative architects in 1957–1961, a sample that included some of the most eminent architects of the 20th century such as Eero Saarinen, Louis I. Kahn, I. M. Pei, and Philip C. Johnson. In turn, in 2006–2007, the American Institute of Architects conducted a survey to identify America's favorite architecture, first among its 2,448 members and subsequently among 2,214 members of the general public. Creativity ratings of the architects (N = 40) by (a) journal editorial board members, (b) expert judges, and (c) the architects themselves collected in 1957–1961 predicted the popularity of their works 50 years later. Our results suggest that in the domain of architecture, expert assessments of individual-level creativity predict future product-level popularity.

Keywords: architecture, IPAR, eminence, popularity, creativity

It is difficult to overestimate the contributions of the Institute of Personality Assessment and Research (IPAR) to the scientific study of creativity. Essentially, IPAR is known today as the birthplace of the scientific study of creative personality, having contributed to numerous methodological and theoretical innovations that underlie our understanding of creative persons (Helson, 1999; see also Barron & Harrington, 1981; Serraino, 2016). This contribution is reflected in the continued relevance of the findings of this research program to creative personality in contemporary textbooks of creativity (e.g., Kaufman, 2009; Sawyer, 2012).

IPAR's overarching mandate was to understand the psychology of *effectively functioning persons*, a process that necessitated the

tion regarding its survey to identify America's favorite architecture.

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development and application of assessment techniques to study populations that fulfilled this criterion, including writers, poets, mathematicians, and space scientists, among others. However, arguably, IPAR's study of creative architects could be considered one of its best-known contributions to the scientific study of creative persons (Hall & MacKinnon, 1969; MacKinnon, 1962). IPAR researchers employed a unique approach to enable an indepth and holistic analysis of this population. First, they invited some of the most eminent architects of the 20th century to Berkeley, including Eero Saarinen, Louis I. Kahn, I. M. Pei, and Philip C. Johnson, among others. In this sense, one could be assured that the participants under study reflected a "significant sample" given that they represented truly creative persons (see Simonton, 2014). Second, the administered test battery was extensive, including measures of perceptual, cognitive, and intellectual abilities; interests and values; personality; and other related characteristics. This holistic approach enabled the researchers to study the differential contribution of a broad host of factors to effective functioning. Third, the researchers collected excellent ratings of the key criterion of interest (i.e., architectural creativity) by obtaining ratings (and rankings) of creativity from multiple sources, including members of the editorial boards of major professional architectural journals, an independent panel of expert architect judges, and self-ratings by the architects themselves (by asking each architect within the sample to rank the entire sample of architects on creativity [including oneself]).

Fortuitously, almost precisely 50 years after the initial data collection at IPAR, in 2006-2007, the American Institute of Architects (AIA) conducted an independent survey to identify America's favorite architecture, first among its 2,448 members and subsequently among 2,214 members of the general public. We were interested in determining whether the three sets of creativity ratings collected at IPAR in 1957-1961-from journal editorial board members, expert judges, and the architects themselveswould predict the popularity of the architects' works 50 years later-assessed as a function of the inclusion of their works in either of the AIA's lists. This analysis enabled us to test the hypothesis that contemporary ratings of creativity at the individual level are related positively to the popularity of one's output in the future. As such, they would contribute to the larger literature on the long-term stability of eminence, as well as its relationship with popularity (see Farnsworth, 1969; Simonton, 1984, 1989, 1991).

Method

The present study involved a reanalysis of archival data collected from IPAR architects in 1957–1961. The archives are currently managed by the Institute of Personality and Social Research (IPSR) at the University of California, Berkeley. Written permission to access the data was granted by IPSR following the approval of a formal proposal in 2011.

Participants

The 40 IPAR architects were male. The mean age at the time of assessment was 49 years (SD = 7.13; range: 31-63).

Materials

The data used for analysis involved two different sources: (a) data collected from the architects at IPAR in 1957–1961 and (b) the surveys conducted by the AIA in 2006–2007 (published in 2007). These sources are discussed in turn.

IPAR data. Each of the participants (i.e., eminent architects) was instructed to rank the entire sample of 40 eminent architects from most creative (rank = 1) to least creative (rank = 40). In addition, each architect was also rated on architectural creativity by two independent groups of experts. The first group consisted of the editorial board members of leading architecture journals and magazines using a 7-point scale ranging from 1 (lowest rating on creativity) to 7 (highest rating on creativity). The six editorial board members whose ratings were included in the present analysis were Peter Blake (Architectural Forum), John E. Burchard and Elisabeth K. Thompson (Architectural Record), Joseph Watterson (Journal of the AIA), and Thomas H. Creighton and Ilse Meissner Reese (Progressive Architecture). The second group consisted of a five-member panel of architecture experts who also rated each participant on architectural creativity using the same 7-point scale. Specifically, Donald D. MacKinnon, director of IPAR, asked William W. Wurster-a renowned Bay Area architect and dean of the College of Environmental Design at the University of California-to assemble an expert panel of architects, which led to the creation of a five-member panel including Wurster himself as well as four of his colleagues from the College of Environmental Design (i.e., Donald Olsen, Vernon DeMars, Joseph Esherick, and Philip Thiel). Importantly, the journal editorial board members and the panel of experts rated not only the 40 architects on architectural creativity but also 85 other architects who were in one of two control conditions: architects who had worked in the same architectural firms as the elite architects and another sample of architects recruited from across the United States who had not worked in those firms. The present analysis will only focus on the 40 elite architects because we were interested in determining whether relative differences in creativity, even within a homogeneously elite group, would nevertheless be predictive of future popularity (see Simonton, 1984).

AIA data. The AIA data consisted of the results of the survey on America's Favorite Architecture published on the 150th anniversary of the AIA in 2007. Two lists were published at the time. The first list included 248 structures identified by AIA members as their "favorite" structures. Specifically, each respondent was asked to name up to 20 of his or her favorite structures in any of 15 predefined categories of buildings. The list of 248 structures was selected because each structure within it was identified by a minimum of six different AIA members. Subsequently, a pictorial list of these structures was administered to the general public, who rated each structure on "likeability." This latter list is referred to by the AIA as America's Favorite Architecture. Examining each list separately is important because the list of 248 structures represents the evaluations of respondents with relatively more experience and/or formal training in architecture, whereas the list of 150 structures represents the attitudes of laypeople who might not necessarily have such experience and/or formal training in architecture. America's Favorite Architecture was the outcome of this survey, receiving extensive coverage in the media. For a detailed description of the survey analytics, please see the Appendix. An electronic copy of the list is available at http://www.npr.org/ documents/2007/feb/buildings/150buildings.pdf.

Results

Our aim was to examine whether structures designed and/or built by any of the 40 IPAR architects were included on either of the two lists. The analysis began by investigating the correlations of creativity ratings among journal editorial board members, expert judges, and the architects themselves. To ensure that in all cases (i.e., journal editorial board members, expert judges, and the architects themselves) higher scores represented greater levels of creativity, the average rankings produced by the architects themselves were subtracted from 40 prior to computing the correlations. The results demonstrated high correlations across the board (see Table 1). In addition, we examined the degree of correspondence between the selections made by AIA members in terms of their favorite structures and the selections made by laypeople in terms of their most liked structures in two ways. Focusing on architects as the unit of analysis, of the seven architects whose works appeared in the list of favorite structures by AIA members, five were also included in the list of most liked structures by laypeople (71%). In turn, when we shifted our focus to the structures themselves, of the 30 works that appeared in the list of favorite structures by AIA members, 12 were also included in the list of most liked structures by the laypeople (40%).

Next, we set out to test the hypothesis that the three sets of creativity ratings collected at initial assessment in 1957-1961 would predict the popularity of the architects' works 50 years later—assessed as a function of the inclusion of their works in the AIA's lists. For each predictor (i.e., journal editorial board members, expert judges, and architect ratings), we ran separate binary logistic regressions, corresponding to inclusion in the list of 248 or 150 structures. In each case, the dichotomous criterion variable involved the inclusion (i.e., presence = 2 vs. absence = 1) of each architect's work on the list.

It is important to keep in mind that because of our focus on individual-level creativity, our analysis did not take into account two factors: The first was the frequency by which a particular architect's work appeared on the lists. For example, Eero Sarrinen's structures appeared eight times on AIA members' list of their favorite structures, whereas Harry Weese's work appeared only once. Both cases were treated the same. Second, our analyses did not take into account the relative position of the structures on the lists—either between or within architects. For example, one of

Table 1

Correlations of Architectural Creativity Ratings Among Journal Editorial Board Members, Expert Judges, and the Architects (Collected in 1957–1961)

Journal editorial board members	Expert judges	Architects
_	.76*	.80* .64* —
	Journal editorial board members —	Journal editorial Expert board members judges — .76* —

Eero Saarinen's structures attained the 14th position on the general public's list of America's Favorite Architecture, whereas Louis I. Kahn's entry attained the 80th position. Both cases were treated the same. In the Discussion, we discuss the relative advantages and disadvantages of focusing on creative products versus creative persons as the unit of analysis.

All regression coefficients reported below represent unstandardized values. The results demonstrated that architects' creativity ratings were a significant predictor of inclusion in the AIA membership's list of 248 favorite structures ($\beta = .64, p < .05,$ Negelkerke $R^2 = .76$, OR = 1.90), as well as the general public's list of 150 favorite pieces of American architecture ($\beta = .31, p < ...$.05, Negelkerke $R^2 = .50$, OR = 1.36). Similarly, the expert judges' creativity ratings were a significant predictor of inclusion in the AIA membership's list of 248 favorite structures ($\beta = 7.20$, p < .05, Negelkerke $R^2 = .70$, OR = 1,339.43), as well as the general public's list of 150 favorite pieces of American architecture (β = 4.56, p < .05, Negelkerke R^2 = .52, OR = 95.58). Finally, the journal editorial board members' creativity ratings were a significant predictor of inclusion in the AIA membership's list of 248 favorite structures ($\beta = 6.48, p < .05$, Negelkerke $R^2 = .71, OR =$ 651.97), as well as the general public's list of 150 favorite pieces of American architecture ($\beta = 3.43$, p < .05, Negelkerke $R^2 = .45$, OR = 30.88). In conjunction, our results demonstrate that creativity ratings by experts in a field are reliable predictors of future popularity—both among professionals within the field (i.e., AIA members) as well as laypersons (i.e., general public).

Another method to examine the same data is to compare the average creativity ratings assigned to the architects whose structures were included versus those whose structures were not included in AIA members' list of favorite structures or laypeople's most liked structures. The results demonstrated that compared to those IPAR architects whose structures were not listed on AIA members' list of favorite structures, the IPAR architects whose structures were listed on AIA members' list of favorite structures were rated higher on creativity by the architects themselves, t(38) = 5.48, p < .01, d = 1.78; the expert panel, t(37) = 5.27, p < .001, d = 1.73; and the journal editorial board members, t(28) = 5.26, p < .001, d = 2.49. Similarly, compared to those IPAR architects whose structures were not included on laypeople's list of their most liked structures, the IPAR architects whose structures were included on laypeople's list of their most liked structures were rated higher on creativity by the architects themselves, t(38) = 3.67, p < .01, d = 1.19; the expert panel, t(37) =3.83, p < .001, d = 1.26; and the journal editorial board members, t(28) = 3.30, p < .01, d = 1.82.

Discussion

This study was conducted with the aim of determining whether the architectural creativity of 40 eminent architects assessed in 1957–1961 by journal editorial board members, expert judges, and the architects themselves would predict the popularity of their works 50 years later—assessed as a function of the inclusion of their work in either of the AIA's lists. Indeed, our results demonstrated that in all three cases, architectural creativity ratings were predictive of future popularity. This is a remarkable finding for two reasons. First, it is not unreasonable to assume that expert judgments made in 1957–1961 might have been based on different criteria than the popularity ratings

collected in 2006–2007 by the AIA. Nevertheless, perceived creativity is predictive of future popularity among relatively more and less experienced viewers of the work (i.e., AIA members and laypersons, respectively). Second, given that we focused on a relatively small group of elite architects only, the results indicate that variations in perceived creativity even within a relatively homogeneous group of highly creative individuals can predict the long-term popularity of their output.

Unit of Analysis: Person Versus Product

The results of this study contribute to our understanding of the long-term stability of eminence in the arts and sciences. Previous research examining the long-term stability of eminence has either focused on the creative product as the unit of analysis or the creative person as the unit of analysis. Focusing on the creative product as the unit of analysis is predicated on the assumption that a creator's long-term fame is largely based on the merits of their best work. For example, Simonton (1998) analyzed 496 operas by 55 composers whose work spanned 332 years (1607-1938) to examine the functional relationship between initial reception and current acclaim. His results demonstrated that current acclaim in terms of the success of an opera in modern times is a positive monotonic function of its initial reception. In addition, the relationship between initial reception and current acclaim did go through cycles over time, but this temporal cyclic variation was not due to exponential decay or gradual attrition but rather changes in fashion (i.e., taste).

In another study that took individual works as the unit of analysis, Simonton (1989) zeroed in on the long-term stability of the aesthetic success of a *single creator's* works—namely, Shake-speare's 154 sonnets. Aesthetic success was defined as popularity "registered by the frequency that a creative work is performed, read, recorded, cited, quoted, or otherwise appreciated" (p. 700). To determine the long-term stability of aesthetic assessments, the sources that provided the bases for the ratings were grouped into three periods: those published in the 19th century, the first half of the 20th century, or since the 1950s. The correlation was .83 between ratings published in the earliest and the middle periods, .86 between the middle and the latest periods, and .76 between the relative aesthetic assessments given to the works of a single creator are remarkably stable across large swaths of time.

Interestingly, similar results that attest to stability of eminence emerge when the focus is shifted to the creative person as the unit of analysis. For example, Farnsworth (1969) found that the relative eminence of a group of classical composers remained remarkably stable across decades. In turn, Simonton (1984) assessed the differential eminence of scientists (n = 2,026) according to their presence in historical records. Eminence was gauged in multiple ways using diverse reference works (e.g., historical, biographical dictionaries, encyclopedias). The results demonstrated that "no matter how the historical eminence of scientists is assessed, there emerges an overall consensus on who are the most important contributors" (p. 180). In addition, once the time-wise adjustments are made to historical eminence and contemporary fame (i.e., the number of cited publications), the two variables are shown to be positively correlated. In fact, Simonton (1984) noted that his data likely reflect an underestimation of the strength of the relationship

between historical eminence and contemporary fame because his focus on a sample of elite scientists likely constrained the range of both variables. The same inference can be drawn in the present case, given our focus on a relatively small group of elite architects.

Expertise and Aesthetic Appeal

The results of the statistical analyses reflect a tighter coupling between creativity and long-term popularity when the latter involves ratings collected from AIA members than laypeople. This is true in terms of the relative beta weights and Negelkerke R^2 values observed in the regression analyses, as well as the effect sizes (Cohen's d) obtained in the subsequent t tests. This pattern suggests that formal training and/or expertise in the domain of architecture might bring a person's judgments more in tune with those elements of the works that are more reflective of the architect's creativity. In this sense, the data are broadly consistent with earlier findings that suggest differences between how experts and nonexperts view and judge aesthetic products. This tighter coupling may be due to a number of different factors. For example, experts may exhibit greater levels of aesthetic fluency-defined as the knowledge associated with aesthetic appreciation in a particular domain (Smith & Smith, 2006). This, in turn, might affect the ways in which aesthetic qualities at the surface level are linked to the perceived creativity of the architect (see Tinio, 2013). In addition, there are eye-movement data to suggest that experts view aesthetic products (e.g., paintings and other design objects) differently than nonexperts, displaying greater sensitivity to their structural and compositional properties than nonexperts (Locher, 2014; Nodine, Locher, & Krupinski, 1993). This work suggests that the differences observed between AIA members and the general public could be a function of perceptual differences that have diverged as a function of expertise. Future studies could explore the specific underlying reasons that modulate the strength of the relationship between perceived creativity and popularity.

However, the aforementioned inferences must be qualified because members of the AIA vary in their degree of domain expertise in architecture. Specifically, there are varying membership categories, ranging from members who are registered and practicing architects to members who "do not hold a degree in architecture, but share an interest in the built environment as a professional colleague or enthusiast" (http://www.aia.org/join/). In this sense, AIA members include not only experts but also quasi-expertsdefined as people with some background and training in the domain (Kozbelt & Kaufman, 2014; see also Silvia, 2006). Interestingly, there is some evidence to suggest that expert and quasiexpert ratings of creativity may converge more for artistic than scientific objects. For example, Kaufman, Baer, Cropley, Reiter-Palmon, and Sinnett (2013) obtained expert, quasi-expert, and novice evaluations of creative stories and mousetrap designs. The results demonstrated that expert and quasi-expert creativity ratings were more strongly correlated for stories than mousetrap designs, suggesting that the evaluation of scientific objects might be influenced more by expertise. Future studies could benefit from the use of methods that can distinguish between varying levels of expertise when assessing the relationship between perceived creativity and popularity (see Kaufman & Baer, 2012).

Limitations and Future Directions

We would like to highlight some potential limitations of our approach that should be taken into consideration in future studies involving the interrelationships among creativity, eminence, and popularity in the domain of architecture. The first concerns the dilemma of ascribing to a single architect the creative credit associated with designing a building. As noted by Serraino (2016), because architects typically work in teams, the convention of giving credit to a single architect (rather than an architectural firm) for designing buildings has long been criticized. Although we followed convention by assigning each building to a specific architect—either because he was solely credited with its design or was the most prominent member of the design team—given the availability of detailed archival material future studies would do well to determine more accurately where the creative credit for a structure should lie (see Weisberg, 2011).

Second, it has been shown recently that reputation is not static but rather can change over time. Specifically, Runco, Kaufman, Halladay, and Cole (2010) compared encyclopedia entry lengths from 1911 to encyclopedia entry lengths from 2002 for 100 eminent persons. Their results indicated that the encyclopedias contained quantitatively different records for the same set of eminent persons, leading the authors to conclude that "reputations within encyclopedias change and that they may not be the most reliable index in studies of genius, eminence, and creative accomplishment" (p. 95). Despite their focus on encyclopedias, the more general takeaway message from that study is that future efforts should ideally consult multiple sources to obtain more reliable assessments of eminence and that measures obtained at different time points could paint a different picture of the eminence of the same set of individuals (see also Runco, Acar, Kaufman, & Halladay, 2015).

Conclusion

Our results suggest that in the domain of architecture, expert assessments of individual-level creativity are predictive of future product-level popularity—assessed 50 years apart. As such, they contribute to the literature on the long-term stability of eminence (see Farnsworth, 1969; Simonton, 1984, 1989, 1991) and relate it to popularity in the domain of architecture.

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Appendix

AIA Survey Analytics

On behalf of the American Institute of Architects (AIA), Harris Interactive conducted research to identify America's favorite works of architecture. The research included interviews with AIA members followed by a survey of the general public.

Interviews were conducted online with a random sample of AIA members. Members could nominate as many as 20 of their favorite structures in 15 predetermined categories; an "other" category was included for structures that did not clearly fit in the 14 specific categories. The interviews were conducted online between October 18, 2006, and November 22, 2006. The final results included nominations from 2,448 AIA members (some of whom did not complete the full interview).

From the member nominations, a list of the top 248 structures was developed for inclusion in the survey of the public. These 248 structures represent all works receiving six or more individual mentions from AIA members. For the general public survey, 1,804 U.S. adults, age 18 and older, were interviewed online between December 27, 2006, and January 3, 2007. Respondents evaluated up to 78 structures, selected in random order from the larger list of 248. Respondents were shown a photograph of each structure they evaluated. Like the member survey, the public survey included the option to write in other works that were not among the subset evaluated.

The list of America's Favorite Architecture was calculated using the mean score from the likability scale used to evaluate each project in the public survey. In the case of ties in the mean score, structures were ranked by the number of times they were mentioned as a respondent's personal favorite and then by the number of nominations the structure received by the AIA members.

During the compilation of the list of 248 works, the Apple Store Fifth Avenue in New York City was inadvertently omitted

from the public survey. The building was subsequently evaluated by a separate online survey of the general public, using the same question and overall structure as the original survey. Based on the results of interviews with 2,214 U.S. adults for this survey, the Apple Store Fifth Avenue ranked 53rd on the overall list. These interviews were conducted between January 16, 2007, and January 18, 2007.

For both of the general public surveys, figures for gender, age, race/ethnicity, income, education, and region were weighted where necessary to bring them in line with their actual proportions in the population. Propensity score weighting was adjusted for respondents' propensity to be online.

With pure probability samples and 100% response rates, it is possible to calculate the probability that the sampling error (but not other sources of error) is not greater than some number. With a pure probability sample of 1,804 U.S. adults, one could say with a 95% probability that the overall results have a sampling error of ± 2.31 percentage points. With a pure probability sample of 2,214 U.S. adults, one could say with a 95% probability that the overall results have a sampling error of ± 2.08 percentage points. However, these percentages do not take other sources of error into account. The online surveys are not based on a probability sample and therefore no theoretical sampling error can be calculated.

Notes. This verbatim description of the methodology conducted by the American Institute of Architects (AIA) to determine the list of America's Favorite Architecture was reproduced by the kind permission of the AIA.

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