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THE FINDINGS:

Can credit scores really tell you about where someone is going? Or where they've come from?

Credit scores are not just about credit anymore. In domains far beyond lending, credit scores are touted as providing valuable information about disposition and lifestyle. So, how well do they do?

We have been studying a cohort of 1000 individuals born in Dunedin, New Zealand, in 1972-73, followed from birth, and most recently assessed at age 38. As the cohort Study members approach midlife, their credit scores weigh heavily on their future life chances. Many are primed for major property purchases, starting a business, and taking out a life insurance policy. We wanted to know if their credit scores could predict their cardiovascular health, and if so, why? To answer this question, we linked to administrative records acquired from the Veda Company, the largest credit reference agency in New Zealand and Australia to obtain our Study members' credit scores.

We found that:

> People with higher credit scores tended to be in better cardiovascular health. Each 100 point increase in credit scores was associated with an average 'Heart Age' – an estimate of cardiovascular age[1] - that is 13 months younger.
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> Study members' income in dollars did not explain the credit-health link.
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> The reason that credit scores predict health is because credit scores capture enduring life histories of individuals. Individuals with higher credit scores tended to possess greater self-control skills, to have more advanced cognitive abilities, and to grow up in more advantageous socioeconomic backgrounds. These same skills, abilities, and backgrounds also accounted for their better cardiovascular health. Study members' self-control skills, cognitive abilities, and socioeconomic background predicted their credit scores and cardiovascular health regardless of their income levels.
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> The link to credit scores and cardiovascular health was predictable from the skills, abilities, and backgrounds Study members' possessed as children, despite the passage of nearly three decades. For example, as compared to Study children with the greatest self-control, those with the poorest self-control went on to develop Heart Ages that were 4 years older and credit scores that were 103 points lower (see attached figure).

WHY ARE THESE FINDINGS IMPORTANT?

<u>Credit scores are gatekeepers to economic and social mobility.</u> Credit scoring allows creditors to quickly and inexpensively evaluate credit risks. This has increased access to credit[2], but it means that qualifying for a mortgage, a small-business loan, or a student aid package, is in large part determined by an applicant's credit score.

[1] See Supporting Details on page 3 of this document for a more detailed description of how Heart Age was calculated.
[2] According to a report on "Credit Scoring and Its Effects on the Availability and Affordability of Credit", conducted in 2007 by the Federal Reserve http://www.federalreserve.gov/boarddocs/rptcongress/creditscore/creditscore.pdf

The use of credit scoring as a risk-stratification tool has proven so successful that it has expanded beyond lending and into our everyday lives. Today, credit scoring is used by employers to screen prospective applicants, by phone and utility companies to price contracts, and by automobile insurers to tier premiums. Life insurance companies have begun incorporating credit scores into predictive models of health and longevity.

The application of credit scoring to areas beyond lending raises questions about the personal characteristics that underpin credit scores. This is being debated in congress and numerous states have enacted legislation regulating the use of credit scores[3]. To date, this discussion has largely taken place without empirical information about the social and psychological attributes that make credit scores useful predictors of behavior.

Credit scores reveal quite a bit about a person. In many contexts credit scores already function as a proxy for non-observable, difficult-to-measure indicators of risky behavior. Our findings suggest that one reason why credit scores are predictive is because the same factors that lead individuals to better plan and manage their finances also contribute to improved outcomes in other domains of life. Interestingly, in developing countries where credit scores are either unavailable or unreliable, measurement of a person's conscientious personality is successfully being employed as a substitute for credit scores[4].

Does this study provide justification for the expanded use of credit scoring? Credit scores are already being used. Our aim is not to justify or delegitimize their use, but to draw attention to the social and psychological features that credit scores capture. Our findings speak to the utility and limitations of the expanded use of credit scores. Credit scores capture personal characteristics relevant for predicting behavior in domains beyond lending. But credit scores are an imperfect measure of these characteristics because they can be influenced by inaccuracies in credit history reporting, adverse personal events, local market conditions, and myriad other factors.

Does this mean that credit scores are determined from birth? No. But it does reveal that personal characteristics already evident in the first decade of life make a meaningful and enduring contribution to a person's social mobility. Our findings about the early childhood origins of creditworthiness lend support to a call by the US Consumer Financial Protection Bureau for increased financial education beginning in childhood and for integrating personal finance (e.g. how to manage a budget, the benefits of compound interest, the value of maintaining a good credit score) into today's classroom curriculum[5].

SUPPORTING DETAILS:

Participants are 1,037 members of the Dunedin Multidisciplinary Health and Development Study, which follows children born in Dunedin, New Zealand, between 1972 and 1973. This birth cohort's families represented the full range of socioeconomic status in the general population of New Zealand's South Island. Follow-ups have been carried out at birth and at ages 3, 5, 7, 9, 11, 13, 15, 18, 21, 26, 32, and 38 years, when 95% of the 1,007 Study members still alive took part.

Credit Scores were acquired at the age-38 assessment phase from the Veda Company. The Veda credit score algorithm is proprietary. Scores are based on five-year histories of consumer credit activity and include the following factors: the number and types of credit applications and inquiries, age of credit file, residential stability, adverse information such as payment defaults and judgments, and the existence of any current or prior insolvency information. Factors such as race, national origin, marital status, occupation, salary, employment history, medical or academic records are not included in Veda scoring. The Veda credit scores of our Study members ranged from 12 to 961 (mean of 675.2).

[3] For example, see http://www.ncsl.org/research/financial-services-and-commerce/use-of-credit-info-in-employ-2013-legis.aspx for a listing of introduced or pending state legislation relating to the use of credit information in employment.
[4] http://www.nytimes.com/2013/12/31/business/credit-scores-from-a-test-not-a-history.html
[5] Consumer Financial Protection Bureau (2013) Financial Literacy Annual Report, Available at http://www.consumerfinance.gov/reports/

Heart Age is an estimate of cardiovascular age based on the Framingham cardiovascular disease (CVD) risk score, a single multivariable function that predicts risk of developing all-CVD and its constituents. The 10-year CVD risk for each Study member was computed using sex-specific factors collected at the age-38 assessment phase including: total cholesterol, HDL cholesterol, systolic blood pressure, diabetes status, and smoking status. Framingham CVD risk was then translated to Heart Age using the Heart-Age calculators made available by the Framingham group[6]. Because cohort members were all born within a 12-month period, their chronological age was fixed at 38 years; however, their Heart Age varied considerably, ranging from 22 to 85 years (mean of 38.5).

Cognitive ability was assessed using standardized IQ tests in childhood and again in adulthood.

Self-control in childhood was assessed using reports from observers, parents, and teachers. Self-control in adulthood was assessed via reports of the personality trait of conscientiousness by multiple informants nominated by Study members as people who "knew them well."

Socioeconomic status in childhood was measured by assessing the occupational status of Study members' parents when Study members were children.

Educational attainment was measured in adulthood.

AUTHORS:
Salomon Israel, Avshalom Caspi, Daniel W. Belsky, HonaLee Harrington, Sean Hogan, Renate Houts, Sandhya Ramrakha, Seth Sanders, Richie Poulton, Terrie E. Moffitt

MEDIA CONTACTS:
Salomon Israel, Department of Psychology and Neuroscience, Duke University, Durham, NC;
e-mail: salomon.israel@duke.edu
Avshalom Caspi, Department of Psychology and Neuroscience, Duke University, Durham, NC;
e-mail: avshalom.caspi@duke.edu
Terrie Moffitt, Department of Psychology and Neuroscience, Duke University, Durham, NC;
e-mail: terrie.moffitt@duke.edu

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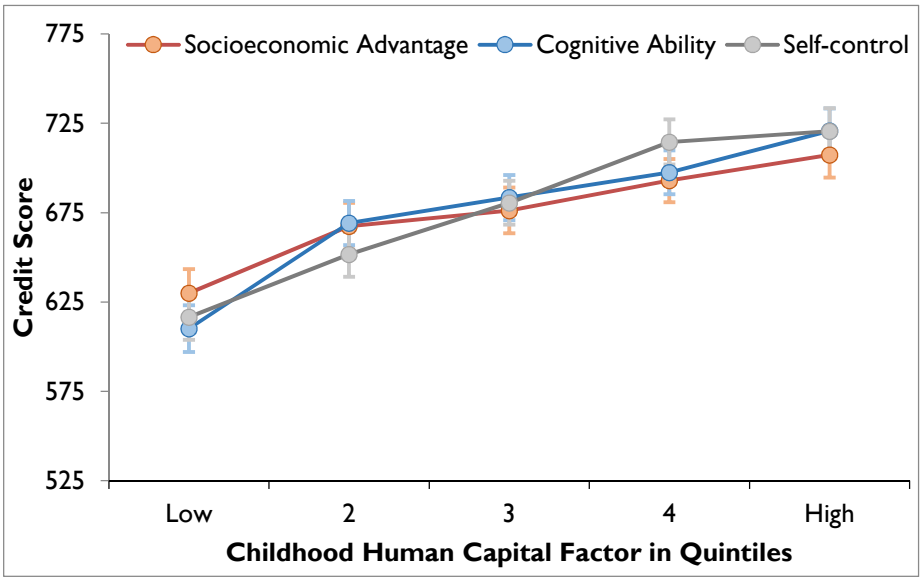
[6] D'Agostino RB, Vasan RS, Pencina MJ, et al. General cardiovascular risk profile for use in primary care: the Framingham Heart Study. *Circulation* 2008;117(6):743-53.

Association between childhood human capital factors, credit scores (Panel A) and Heart Age (Panel B). Quintiles are shown for illustrative purposes; all statistical analyses were performed using continuous measures.

A



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