Why can't we Google™ for the people we want to hire?

For the past six years, I've been working on improving employers' hiring practices, mostly in the context of a W.K. Kellogg Foundation grant that strove to move at-risk youth into the workforce. Our rationale was that more at-risk youth would be hired if only employers could accurately measure their skills, instead of assuming these youth had none. Being a materials scientist/engineer, I enthusiastically dove into the whole metrics angle of this project. One of the most astounding things about employer hiring practices is how incredibly bad they are. Did you know the correlation coefficient between years of education and subsequent job performance is $r = 0.1$?[*1,2] How about the ability of unstructured interviews to predict job performance? Oh, that's a whole 40% better, at $r = 0.14$.[1] How about GPA? GPA correlates to job performance at $r = 0.11$.[1] Personality tests ($r = 0.2$[3–5]) remain extremely popular among employers because they're short, completely race-equitable (no chance of being sued), and fun for applicants to take. Wheeee! No wonder most job applicants feel like their applications are falling onto some kind of corporate roulette wheel, where the chance of getting a job is just that: almost pure chance. Round and round and round she goes, and where the candidate will fall off, no one knows.

For most practical purposes, asking individuals what their zodiac sign is, and hiring by that metric, would be almost as good as the techniques most employers currently use. By the way, I'm a Virgo, if that inspires you to throw a consulting job my way.

There are better techniques for hiring, but few companies use them. Cognitive skills testing is one;[†] structured behavioral interviews (the system Google[6] finally went to) is another. Here we're getting up into the $r = 0.5$–0.6 range.[1–3,7–9] But what that means is that $1-r^2$ or about 60–70% of variance in job performance is completely unaccounted for, even in the best of circumstances.

Enter the personal network. The reason 70–80% of all jobs are still obtained through personal networking[10] is that the information you can get from people, about other people, is more effective (accuracy per unit time expended in the search) than what you can get through broadcasting an ad for a couple of months and then using the traditional degree + resume + interview approach. The upside to hiring-by-personal-introduction is that it's an efficient use of time for the employer. The downside is that in a socially segregated society, it limits jobseekers to jobs in the social networks they're already a part of, rather than the social networks they aspire to belong to.

Let's take materials science and engineering. I ran some queries through the US Census American Community Survey database to find out where different racial groups with a Bachelor of Science degree (BS) or higher in our field ended up, career-wise.

As of 2013, the top US occupations for Caucasians (listed as "Whites" on the census) having a BS degree or higher in materials science and/or engineering were (1) "miscellaneous engineers" (7%), (2) "miscellaneous managers" (6.5%), (3) "materials engineers" (4.4%), and then a long tail of other occupations that are mostly managerial/higher education/technical. The top three occupations for Asian materials science and engineering grads were (1) "miscellaneous managers" (10.2%), (2) "postsecondary teachers" (8.7%) (yes, it wasn't your imagination that most of the professors you had in college were Asian), (3) "Physical scientists " (5.2%), and then a long list of other, mostly technical, fields. So far this seems pretty reasonable, about what one would expect.

Now, the top occupation for African Americans (listed as "Blacks" on the census) having a BS degree or higher in materials science and/or engineering is (1) "writers and authors" (11.9%),

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[*] Many people are shocked by this statistic, but the relationship between education and job performance (measured via supervisor ratings) is very low for two reasons. The primary one is that the standard deviation in job performance between individuals having the same nominal degree is enormous. In fact, it completely overwhelms any gain in average performance provided by the extra two years of education one would obtain in going from, for example, a bachelor's degree to a master's degree. The second contributing factor is that employers hire from a very narrow swath of education. When all the applicants for that programming job already have a BS degree, the BS degree is not much of a differentiator among applicants. If employers hired from a pool that had education levels varying from sixth grade to a PhD, they would be able to see much more of an impact of years of education on their candidates' performance.

[†] There is a fascinating history behind cognitive skills testing. These were the types of standardized knowledge-and-skill tests that were used priorly, among other things, in placing individuals in government jobs (the old "civil service exams"). The Pope Center for Higher Education Policy has argued[15] that when the Supreme Court in *Griggs v. Duke Power* (1971) made it much more difficult for employers to directly test applicants on knowledge and skills, employers went to the college degree as the replacement filter. Indeed, the Pope Center's graph[15] shows the stratospheric rise in the wages of college graduates starting in 1978, the very year that the EEOC's Uniform Guidelines limiting employer use of assessments as hiring tools went into effect, about seven years after the original Supreme Court decision.

followed by (2) "office clerks" (9.4%), and (3) "human resources managers" (9.2%). The list of occupations that follows is also completely outside of the training they received: (4) "athletes, coaches, umpires," (5) "medical and health services," (6) "web developers" (ironically, only mixed-race African Americans got these jobs), (7) "purchasing agents" … you get the idea. US Hispanic materials scientists and engineers fared somewhat better, becoming (1) financial analysts (12.2%), (2) environmental engineers (8.6%), and (3) private detectives (5.1%), followed by a long tail of predominantly industrial production-oriented jobs.

This is what hiring by personal network does: It excludes those not in the network. Believe it or not, it's not access to education that's the underlying issue. Yes, that's an issue, but a separate one. African Americans who obtained at least a bachelor's degree in materials science and engineering had an almost identical distribution of degree status as Caucasians (African Americans with 50%/38%/12% for the BS/MS/PhD degrees versus Caucasians' 51%/34%/11%[‡]). My guess is that African Americans lacked knowing anyone who could get them a job in their field because the United States is still, after all these years, a racially segregated society.

In Europe and Africa, referral-based hiring has been studied as one of the root causes of female underrepresentation within specific companies or occupations.[11–13] In a Malawi study,[13] it was found that males would refer males 77% of the time, but if paid to refer only females, the number of referrals did not drop, and the quality of the now-100%-female referrals was, if anything, slightly better than the male referrals. The conclusion was that men actually knew qualified women, but they didn't always know them well enough for them to be the first to come to mind or feel comfortable volunteering them as a first choice. A premium payment for that information turned out to be enough to extract those referrals from the further reaches of men's personal networks and bring them into the company hiring pool.[13] Perhaps coincidentally, on the day I wrote about that study, Intel announced its intent to double referral bonuses for employees who submitted referrals who were females or underrepresented minorities.[14]

I imagine the poor job-to-person matching situation will change once and for all when we can finally Google people, the way we Google facts, images, and videos (and, by extension, businesses, geographies, and consumer goods). I've often wondered, "why can't I just put 'grant writer, museum exhibitions, 90% success rate, materials science background' in a search engine and come up with someone who can help out with the next MRS *Strange Matter* exhibit proposal? Like maybe one of those African American writers whom already has a degree in materials science?" The answer is because the metadata doesn't yet exist for people the way it does for facts, images, and videos.

Fascinatingly, the kinds of things we really want to know about the people we hire—Will they show up every day for work? Do they really know their stuff? Are they productive? Can they adapt to a rapidly changing field?—is nowhere to be Googled. It's also darn nigh impossible to discern with our current hiring practices. But that metadata will exist, someday. At least a half-dozen startup companies are working on the problem, and I've had the privilege of working with a few of them. When we finally have people metadata, maybe we can let go of social network-based search for hiring purposes. I envision a Google-to-hire system that extends much further outward than my own social network (ok, ok, that's a pitifully low bar), and is more efficient than the human resource departments of most organizations I've worked with (sadly, also not a very high bar). Then, maybe the final boundary—that of equitable access to jobs and a higher standard of living—will be broken down by technology in a few years, rather than having to wait several hundred years for people themselves to slowly diffuse across invisible social network barriers.

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[‡] The missing 4% of Caucasians are the 4% who obtained professional degrees.