ACT and BayesACT Occupational Social Status Modeling

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Occupational status is an important concept in sociology that describes a cultural perception of worthiness. Occupations with higher social statuses, like firefighters, are held in higher esteem than occupations with lower statuses, like bankers. These rankings influence everything from social interactions [1] to policy decisions [9], and numerous surveys have been conducted to measure social prestige. However, little convincing work has explained how participants derive culturally agreed upon occupational status rankings, with explanations involving education or income failing to explain how professions like bankers have such low status [2]. We propose a conceptualization of status as a network of societal deference relations [3] which we will show is a more theoretically grounded operationalization of status. According to this model, if one profession repeatedly defers to another, the other profession has the higher status.

A theoretically well-grounded method to compute deference relations is Affect Control Theory (ACT). We can use ACT to compute the perceived cultural likelihood of deference between different professions by computing the deflection when an identity (profession) A performs the action *"defers to"* on another identity B. If the deflection is high, A is unlikely to defer to B. For each profession A in a set of 304 occupations, we computed the averages of the deflections when A deferred to other professions in the set. High averages mean that the profession societally tends not to defer to others and therefore has a higher social standing. These average deference deflections (shown in Figure 1. (b)) correlate much more strongly with Harris Poll occupational status scores (a prominent occupational status ranking) [8] than General Social Survey occupation prestige scores computed by Nakao and Treas [6] (Figure 1. (a)), yield results that match with measurements of social value, favour cultural esteem over financial power, and strongly predict General Social Survey workplace outcomes like respect, happiness, and job satisfaction [11].

We can refine our model deference calculations by using a recent generalization of ACT, called Bayesian Affect Control Theory (BayesACT). This formulation represents identities as probability distributions in EPA space instead of simple points and transitions between identities according to a Markov process [5, 10]. There are several advantages of this, one of which is deflection of average identities differs from average deflection of identities. That is, a clergy deferring to a file clerk would have a low deflection according to ACT, but the polled variances in the identities of clergy and file clerk are great enough that many people would think deference has a very large deflection (e.g., if they have a negative view of clergy). Average deference deflections using BayesACT better models an overall societal view and correlates more strongly (Figure 1. (c)) with occupational status than ACT.

Deference deflection means may be inaccurate in computing a society-wide status measure because deferences are considered in isolation. For example, deference from an actor with high status may be culturally more significant than deference from low status. Similar results are often seen in social networks [4], and so we used a modification of PageRank [7] to compute status measures. We created the complete graph of profession deference by transforming deferences into directed edges and computed the eigenvector of the normalized adjacency matrix to yield occupational status measures (Figure 1. (d)), which had stronger correlations with Harris Poll scores than the other three measures.

We describe a computational derivation of how cultures agree upon occupational status scores based on the ACT, and refined this derivation with probabilistic BayesACT and graph centrality information propagation. These derivations correlate better with status than other approaches and maintain construct validity. Our model also suggests a framework for understanding similar constructs by using different actions and identities.
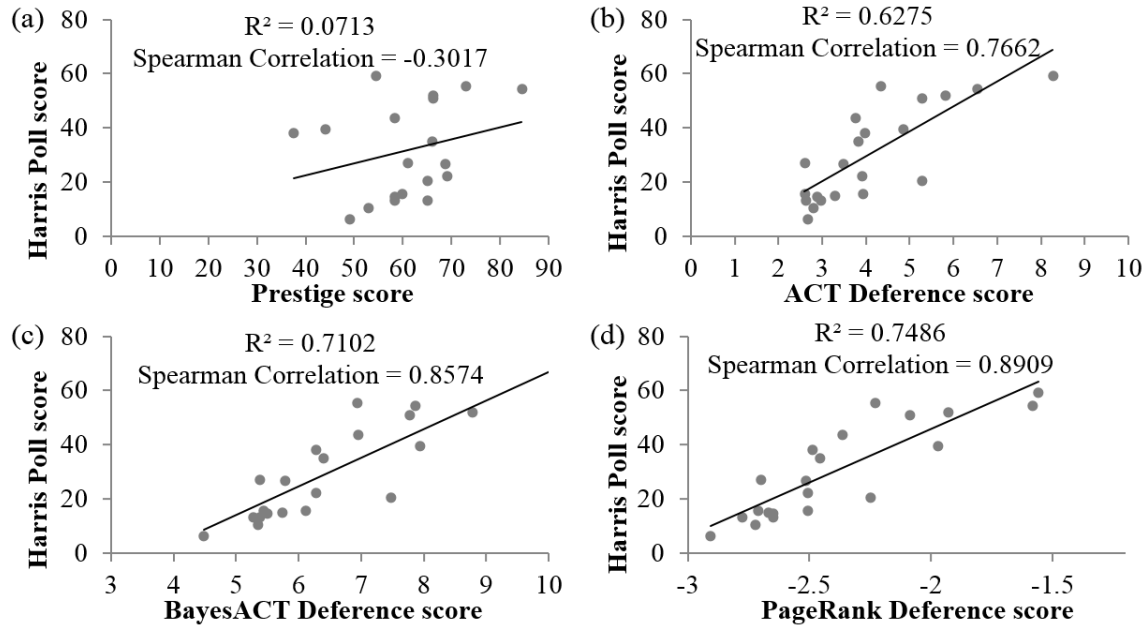
Figure 1: Harris Poll scores [8] against Prestige (a), ACT deference (b), BayesACT deference (c), and PageRank deference (d) scores

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