Occupational Social Status Modeling with Affect Control Theory

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Occupational status is an essential concept for stratification scholars. It is a central part of structural inequality, delineating power differences between groups of people and influencing interactions between professions [16]. Understanding how occupations are mentally organized is important to answer questions including how individuals navigate social situations [16], why people choose particular careers [1], and where scarce resources will be allocated [13]. To this end, numerous occupational status polls have asked respondents to rank jobs based on their social standings [2]. These rankings are culturally stable between people even across time. The Harris Poll rating is a prominent poll that will be used in this paper. It asked approximately 1000 adults from 2000 to 2009, representative based on factors including age, gender, education, race, and region, to rate the status of 23 occupations [12]. The final ratings were the mean percentage of respondents over five years who selected "very great prestige".

However, despite the polls and importance of occupational status, there has been little convincing work explaining how participants derive occupational status rankings. One major approach uses a macro stratification framework that focuses on economic power measures, which does not adequately explain how professions like farmers have much higher status than stockbrokers [2]. Using economic power instead of cultural evaluations of esteem, worthiness, and value to society leads to a lack of construct validity.

Instead, we use the conceptualization of status as a network of societal deference relations [4] which has been shown to be a more theoretically grounded operationalization of status [3]. According to this model, if one profession repeatedly defers to another, the other profession has the higher status. In this paper, we present a computational derivation of status scores based on the socio-psychological Affect Control Theory and improvements based on probabilistic BayesACT and graph centrality information propagation. These derivations correlate better with status than other approaches and maintain construct validity. This paper specifically demonstrates the graph centrality measure as an extended version of the deference scores presented in [3].

Affect Control Theory

A theoretically well-grounded method to compute deference relations is Affect Control Theory (ACT). ACT is an established social psychological theory of self based on large-scale survey measurements of affective sentiments f about identities (e.g.*"doctor","mother"*) and behaviors (e.g.*"counsel","comfort"*). Sentiment consensus is reliably replicated across cultural groups and languages, and is stable across time [10, 7]. Affective sentiments are measured across a large set of dimensions, but three factors explain most of the observed variance: **E**valuation (roughly good vs. bad), **P**otency (roughly strong vs. weak), and **A**ctivity (roughly

fast/loud vs. slow/quiet) [6]. These EPA values make up f. When a behaviour is observed between two actors, a transient impression (τ) is created of both actors through a non-linear transformation, which leads to a corresponding deflection equal to the squared difference between f and τ. ACT posits that the difference corresponds to emotions the actors feel, and actors tend to take actions that minimize their deflections [6]. For example, a doctor (normally good on the evaluation scale) would tend not to ignore a patient because that would lead to a very negative transient impression. The difference between f and τ in evaluation would lead to a high deflection, making the action unlikely according to culturally agreed upon appraisals.

We can use ACT to compute the perceived cultural likelihood of deference between different professions. If the deflection when identity (profession) A *"defers to"* identity B is high, then A is unlikely to defer to B. For each profession A over all of the 304 occupations for which EPA scores were available[1], 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 [12] than General Social Survey occupation prestige scores computed by Nakao and Treas [9] (Figure 1. (a)). According to both the Harris Poll and ACT, the highest status occupations—firefighters and doctors—are ones that are perceived as providing a service to society. Evaluation was found to be a more significant contributor to deflections than potency, which supports how deference deflection measures cultural esteem instead of financial power. In odds ratio analysis, deference scores were also the strongest predictors of General Social Survey workplace outcomes like respect, happiness, and job satisfaction [15], even when compared to education and income. ACT, being grounded in social interaction theory and empirically validated with several measures, is an effective conceptualization of occupational status.

A recent generalization of ACT, called Bayesian Affect Control Theory (BayesACT), provides a better model of deference relations. This formulation represents identities as probability distributions in EPA space instead of simple points and transitions between identities according to a Markov process [8, 14]. There are several advantages of this, one of which is that the deflection of average identities is not the same as the 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 (for example, if they have a negative view of clergy). The average deference deflections using BayesACT better models an overall societal view and correlates more strongly (Figure 1. (c)) with occupational status than ACT.

Graph Centrality Methods

The means of deference deflections may not be the most effective approach to compute a society-wide status measure both because deferences are computed in isolation and because all professional deference may not be weighted equally. For example, it may be culturally more significant when a firefighter (who has high status) defers to a doctor than when a real-estate agent (who has lower status) does. Similar results are often seen in social networks [5], and so we used a modification of PageRank [11] to compute status measures. The complete graph of profession deference for 304 occupations was derived by using the inverse exponentials of deflections as directed edges. If the deflection for A deferring to an B were high, the directed edge from A to B would be low since deference is unlikely. We computed the eigenvector of the

[1]We used EPA ratings of 304 occupations (including the 23 Harris Poll ones) from a recent EPA survey of over 2400 concepts rated by 30 males and 30 females. The EPA rating for the *"defer to"* behaviour is from the same survey. Status measures are computed with all 304 identities, and we compare with the 23 Harris Poll scores.

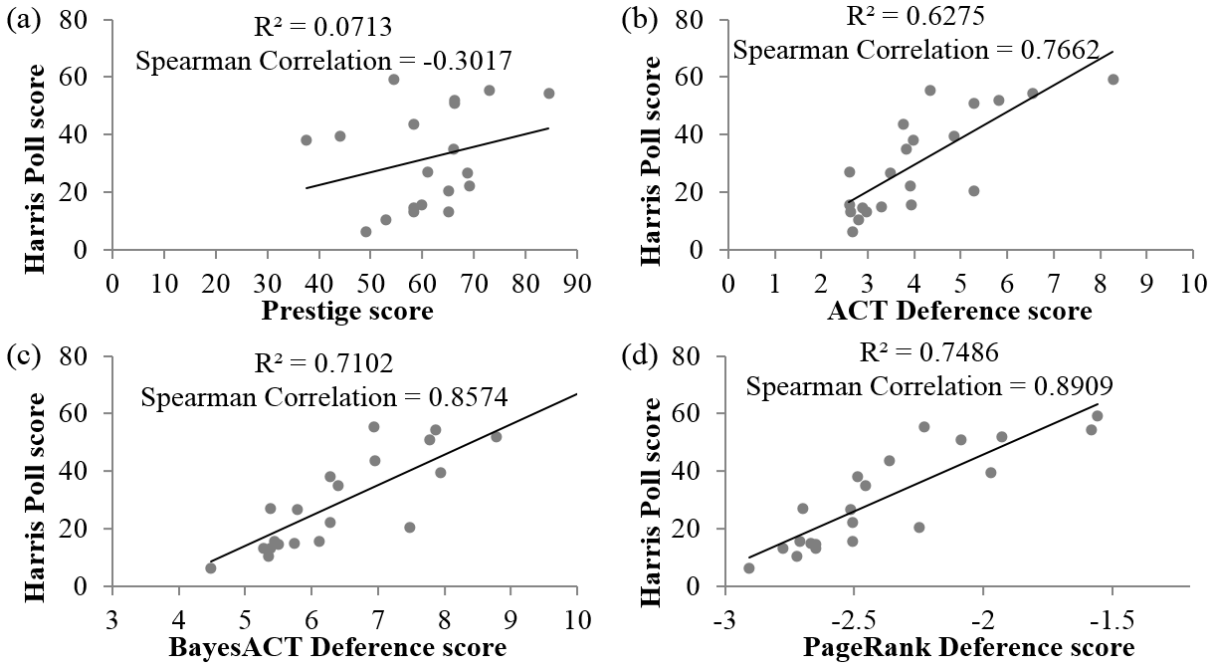

Figure 1: Harris Poll scores [12] against Prestige (a), ACT deference (b), BayesACT deference (c), and PageRank deference (d) scores

normalized adjacency matrix to yield occupational status measures (Figure 1. (d)), which were found to correlate better with the Harris Poll scores than the other three measures investigated.

Discussion and Outlook

We used BayesACT and graph centrality to construct a theoretically grounded and empirically validated formulation of how occupation status is determined. Our hope is to not only shed light on how societies value professions, but also to provide a framework for understanding similar constructs. We used the action defer and occupation identities in this work, but other actions and identities could represent different social structures.

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