Description of Methods:
Estimating Judicial Traits From Text Analysis of Expert Evaluations

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1 Expert Evaluations as a Source of Judicial Traits

1.1 The Approach

The method we introduce uses elements from some of the methods above to measure judicial traits, including ideology. It draws on those aspects that we believe produce the most valid results, while incorporating a technique that, to our knowledge, has not been used to measure ideology in any field: text analysis of expert evaluations. Although the method involves relatively new techniques and difficult design choices, the approach is conceptually simple: it quantifies 33 years of evaluations drawn from tens of thousands of experts. The evaluations are compiled by academic publisher Wolters Kluwer's *Almanac of the Federal Judiciary* ("the Almanac"). The experts comprise lawyers and ex-law clerks with professional experience with each of the judges, including the judges' written opinions, judging style, and courtroom/chambers demeanor.

Drawing from the discussion of the assumptions behind other methods, the AFJ scores attempt to resolve the threats to sensitivity and validity, discussed above. First, the AFJ scores draw on observed judicial behavior, rather than (as with Sen (2016), JCS, and CBI) political behavior. Second and relatedly, the AFJ-score source data relate directly to actions of the judges themselves, rather than political actors connected to the judges (as with JCS and CBI). In vote-counting (Martin

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and Quinn 2002; Harold J. Spaeth and Benesh 2017) or proxy methods (Bonica, Chilton, Goldin, Rozema and Sen 2017; Epstein, Martin, Segal and Westerland 2007), ideology is a latent trait; it is not directly observed. Researchers themselves must therefore make assumptions about which observable traits or behaviors signal which type of ideology. Strictly speaking, the experts surveyed in the Almanac do not directly observe ideology either. But what they do observe—written orders and opinions, private settlement discussions in chambers, and comments made from the bench—come much closer to direct observation of ideology than most existing methods. Third, while judicial "votes" are probative of judicial ideology, we believe that a judge's judicial reasoning in her written opinions, orders, and analysis from the bench provides much clearer insight into her judicial ideology than her decision to affirm or reverse. The AFJ scores capture that nuance, albeit indirectly, by drawing on the experiences of legal experts who have studied their opinions and interacted with them in person over time. In this sense, the technique is similar to Segal and Cover (1989)'s analysis of media op-eds, which for nominees with judicial experience, draw on the judge's previous opinions. Unlike Segal and Cover (1989)'s source material, which is written before the justice is confirmed, the AFJ reviews are based on the judge's past conduct in that judicial position. Fourth, the AFJ scores are sensitive to minor variations between judges and to change over time. Indeed, because the evaluators' scores entail a sample of a theoretical population of all potential evaluators, we can estimate standard errors and confidence intervals for each point estimate.

1.2   Advantages and Limitations Compared With Existing Measures

As Table 1 shows, our method has several advantages over existing methods. Bonica et al. describe their method as among the first, to their knowledge, to allow "time-varying estimates of the ideology of all judges outside the Supreme Court—a possibility that opens up a variety of questions for future research to explore." Like the CBI scores, AFJ can include the entire Article III judiciary on one scale, and it can track changes over time, going back to 1985 (CBI goes to 1995 for lower courts and 1960 for the Supreme Court.) Our scores also provide information on judge traits other than political ideology: ability, temperament, trial practice/oral argument style, and settlement style/opinion quality. We plan to analyze these traits in future work.

Our scores also have a couple of possible vulnerabilities. First, because the evaluations necessarily come from lawyers most familiar with the judges, different

Table 1: *Judicial Ideology Measures Compared*

Measure	Spaeth	Martin & Quinn (2002)	Bailey (2007)	Judicial Common Space (JCS) (2007)	Segal & Cover (1989)	Clerkship-Based Ideology (CBI) (2016)	Cope & Feldman (2018)
# Judges Covered	113	48	48	600?	48	1,800?	4,500
Years Covered	227 (1791–pres.)	79 (1937–2015)	79 (1953–pres.)	65 (1953–pres.)	80 (1937–2016)	10 (Dist. & Cir.) (1995–2004) / 56 (S.C.) (1960–2015)	33 (1985–pres.)
Based on Past Judicial Behavior	X	X	X				X
Dynamic	X	X	X			X	X*
Incorporates Opinion Content							X
Covers Circuit Courts				X		X	X
Covers District Courts						X	X
Accounts for Differences in Case Mix			X		X	X	X
Protected from Evaluator Bias	X	X	X	X		X	
Can ID Multi. Dimens.		X	X				X

*updated every 3–4 years on average

sets of evaluators will be evaluating different judges. This fact is unlikely to bias the results, however, as any variation is unlikely to be systematic. That is, most variations in judging criteria should be uncorrelated and therefore not bias the overall results.

A second possible limitation is evaluators' structural or categorical biases. It is likely that some of the evaluators posses some degree of regional bias; what lawyers consider to be a conservative judge in the South (5th and 11th Circuits), for example, may be different from what lawyers on the West Coast (9th Circuit) consider to be a conservative judge. In other words, the evaluations may be somewhat endogenous to lawyers' regional or local biases. If so, the scores would be biased toward

uniformity, with the degree of ideological difference between circuits understated. To gauge the extent of this potential bias, we compare the average ideology score by circuit in Figure 3. As the figure shows, there exists significant variation between the circuits, more than would be expected if evaluators' orientation significantly muted regional variation. Finally, to the extent there exists any inter-circuit bias, the fact that judges sit on cases by random within any circuit (but see Chilton and Levy 2015) means we should not expect *intra*-circuit variation to suffer from the same bias. There may, however, be systemic conscious or unconscious bias against members of certain demographic groups, based on ethnicity, gender, or age, for example (see, e.g., Sen 2014*a*,*b*). For instance, if lawyers were to systematically and unfairly evaluate female judges as more liberal than male judges, middle-age judges as more able than elderly judges, or white judges' opinions as being of higher quality than that of Latino or black judges, those biases would bias the scores. (Though any such finding would present an interesting research puzzle in itself.)

1.3   Methods and Data

The Almanac has been published by Wolters Kluwer Publishing since 1985.[1] It contains detailed biographical data and subjective evaluations entries on all judges in the federal judiciary (including senior judges, as well as bankruptcy, magistrate, and other Article I judges). The judges' entries comprise biographical information, key cases, and, most important for our purposes, the exclusive-to-AFJ *lawyers' evaluations*. In response to interviewer prompts, lawyers evaluate different aspects of the judge using their own words. The lawyers' evaluations comprise five categories for each judge: (1) Ability; (2) Demeanor; (3) Trial practice (district)/Oral argument (circuit); (4) Settlement (district)/Opinion quality (circuit); and (5) Ideology (for district, broken into ideology and criminal sentencing). The Almanac routinely updates the judges' entries, with all judges within a given district or circuit updated in a single batch. About two to three districts are updated each month, meaning about 30-40 districts and about five circuits per year. For most of its his-

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[1]For most of its 33-year history, the Almanac was published only in hard-copy form. The updates, which took the form of loose-leaf page inserts, were distributed to subscribers multiple times per year. When subscribers received the updates, they were instructed to discard the old information, and it seems all or nearly all of them did. Wolters Kluwer retained an electronic record of this information, but those records were destroyed several years ago. Wolters Kluwer retained in its New York City office a single hard copy version of the archived records, which Wolters Kluwer officials allowed us to use for the purpose of this research. Because most of the records existed only in hard-copy format, we first needed to manually scan and digitize over 100,000 pages of Almanac content. This task involved several legal, logistical, financial, and technological challenges, which took several trips between Virginia and New York and about 32 months – from May 2015 until December 2017 – for one of the authors to complete.

tory, then, it took approximately three to four years to complete one full update, so each judge's entry was replaced that often. Starting around 2014, in response to consumer feedback, the Almanac increased this rate to roughly every two to three years.[2] Regardless, the lawyers' evaluations are re-conducted with new evaluators and replaced with every update.[3]

Wolters Kluwer contracts with professional third-party survey firms to conduct the lawyers' evaluations. For each judge, they seek a stratified representative sample of lawyers who have substantial and recent familiarity with that judge. The surveyors attempt to represent criminal and civil lawyers in approximately equal numbers[4] The strategy to identify the appropriate sample of lawyers is tailored to the particular jurisdiction in question, as different types of districts (rural/urban, Northeast/South) have different dynamics between and within the federal courts and bar. The overarching goal for every court is to achieve a representative sample of those familiar with the judges of the court.

The surveyors identify lawyers through a variety of means, including official court records of appearances and third-party publications listing prominent lawyers in the district or circuit. In general, the lawyers interviewed have personally appeared multiple times over the previous few years before the judge in question.[5]

For judges who have served for several years, the surveyors attempt to find eight to ten lawyers per survey.[6] The surveyors attempt to elicit comments for each of the five categories, with a maximum of one lawyer comment per category. In general all lawyer comments are published, often abridged for the most relevant and substantive language. The editor censors only those comments that are extreme outliers or that involve vulgar, obscene, racist, sexist, or other plainly inappropriate

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[2] Each volume I (district judges) contains about 1700 pages; each volume II (circuit judges) contains about 600. Therefore, the volume is now adding about 9000 pages per year. For the years 1985 to 2005, the volumes combined pages total roughly 30,000. From 2005 to present they total roughly 60,000 pages. By its nature, the biographical information remains relatively unchanged between updates, except with certain things like publications. The key cases are occasionally supplemented with new cases, with less key cases occasionally dropped.

[3] Though the entries are updated on an ongoing basis, paper updates are issued to hard-copy subscribers only every four months. Each tri-annual issue is accompanied by a list of changes from the previous version. Changes to the online version are released once per month, which replace and eliminate the corresponding outdated information.

[4] Though government ethics rules prohibit current government lawyers (including assistant U.S. attorneys) from giving interviews, the surveyors make a point of interviewing former government attorneys.

[5] According to the Almanac editor, "we do our best through research to verify that they have appeared before the judge in the last three years, and that they've had more than one appearance." The sample therefore necessarily contains a disproportionately large number of relatively senior lawyers.

[6] For judges new to the bench, they attempt to interview two to six.

language, which happens extremely rarely.[7] Figure 1 a typical review, D.C. Circuit Judge Brett Kavanaugh's 2009 entry.

Over a recent 10-year period, approximately 16 to 30 different lawyers give comments on any established judge. Over the 32-year period over which the Almanac has been published, a typical judge serving the whole period might be evaluated as many as 80–90 times in each of the five categories. With around 1200 district-level judges and 250 circuit judges on average, there are approximately 14,500 judge-years (i.e., total entries) over the 32-year period and 7250 judge-years over the recent 10-year period. Counting just circuit judges, those figures are 3020 and 1000 judge-years, respectively.

1.4   Data Analysis

Our analysis involves using each of the five evaluative categories – ability; demeanor; trial practice/oral argument; settlement/opinion quality; and ideology – to construct a discrete index. Each index contains multiple potential factors. For instance, "ability" might comprise *intelligent/not intelligent*, and *high legal ability/low legal ability*. "Argument activism" might comprise *active/passive* and *demanding/lenient*. "Ideology" might comprise *liberal/conservative*, *pro-civil government / anti-civil government*, *pro-business / anti-business*, *pro-plaintiff / pro-defendant*, and *pro-criminal defendant/pro-prosecution/criminal government*. "Opinion quality" might comprise *well-written/poorly written*, *clear/unclear*, *long/short*, and *clever/dull*.[8] For the time-being we analyze a set of pilot data comprising only ideology, as those scores are the most easily validated by comparison with existing ideology measures.[9]

For ideology, we examined the ideology section of each judge-year evaluation, compiling a corpus comprising all words ever used and their incidence.[10] With these

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[7]On very rare occasions, judges complain about one or more particular evaluations. They are mostly district judges, and rarely those who get bad uniformly bad evaluations. In a minority of those cases, the Almanac agrees to re-conduct the evaluation survey, surveying a new set of lawyers. The reevaluation is not guaranteed to result in more agreeable evaluations and in theory can produce worse ones. Nonetheless, this phenomenon produces an expected minor score-increasing and variance-reducing bias, though there is no reason to believe that it affects any set of judges systematically.

[8]We create an $n \times k$ matrix, with n judge-years (e.g., Smith 2014) (year being the year of evaluation) and k attributes. Attributes roughly include each of the paragraphs in the AFJ. Examples include appointing year, appointing president, education, and work experience. The five categories of Lawyers' Evaluations – ability, temperament, argument activism, ideology, and opinion quality – are each one column.

[9]We will explore the other traits in future work.

[10]For now, we limited these analyses to the years 1993 and later because, for previous years, the

Figure 1: 2009 Review for D.C. Circuit Judge Brett Kavanaugh

Lawyers interviewed said Kavanaugh is very sharp. "He has very sharp skills." "He's very bright. He has good legal ability." "He is well prepared and well versed in the law. He has a good grasp of the law." "He is incredibly smart. He knows all aspects of the law. He's a good judge who probably needs more seasoning and more experience." "He is very bright." "He's very smart. He was the best prepared." "His legal ability is very good, but it goes down from there."
Kavanaugh has a very good courtroom demeanor, lawyers said. "His demeanor is very good. Lawyers who know their stuff have no problems." "His demeanor is good. He treats all parties with respect. He gives the government more leeway." "His demeanor is very good. He is very self confident and smart. Do not mess around with him in any way." "He has a good temperament. He is not as abrasive as some. He is civil to both sides." "His demeanor is very good. He treats lawyers well." "He is very courteous."

Lawyers interviewed said Kavanaugh is very active at oral argument. "He is very active on a panel. He only asks factual questions. He makes his bias shown also." "He stays with the facts and the record. He is active." "He is almost an activist conservative. Do not let him trap you in questioning. He can go anywhere is oral argument. Do not avoid his pointed questions meant to trap unsuspecting lawyers." "He sticks with the facts and the law. He is fairly active on a panel." "Answer his questions directly and to the point. Never be at all evasive. He is active and direct. He does have a preconceived notion where to explore." "Be ready to go and super prepared. He is active in oral argument. He asks mostly factual questions. There are no surprises with him." "You must be as prepared as he is. He is a hard worker who reads and absorbs it all. It does not get better in oral argument. Be very careful he does not trap you. He is active to question within his agenda." "He has no quirks, just be prepared and know your case inside and out. His questions are both hypothetical and factual. He is young and eager and has good potential."

According to lawyers, Kavanaugh is conservative, but tries to be fair. "He is ultra conservative." "He is conservative, but tries to be fair to both sides. You must be ready to work around him. He is conservative by background and nature. He has the slightest defense leaning. He will not take chances or stick his neck out, but he's a good guy. He's a decent judge who hopefully will become more well rounded." "Be prepared and ready to go. He has a conservative slant. He is not an activist. He has no agenda, but he leans toward the defense. He does give both sides a fair shake to prove their case. He should, get better as time goes by. He is a nice guy and a good judge." "He has a slight conservative bias. His merit shows. He never abuses lawyers. You can work around his bias. He is open minded most of the time." "He is very conservative by nature. Some might say he has an agenda, I have not seen it. He does have a defense leaning. He goes with the facts and the law. He will not stick his neck out." "He is very conservative. It shows all the way through if he does not like your position." "He is a pro-police, right wing activist. If you are up against the government you have a real problem." "He has a serious government bias. Look elsewhere for support. I am hoping he will grow into the position. He's not my first choice right now." "He has a super strong conservative leaning. Defendants have little chance with him. You must do your best to communicate your position. Once in a while, he will listen to a creative argument. He will never put himself out for the defense in criminal matters. He's not ever my first choice. I hope he gets more open minded." "He can be tough on the government."

Kavanuagh's written opinions are well though out, lawyers said. "His writing is quality and his opinions are quite scholarly. His strong bias shows through and through." "He writes decent opinions. They are well thought out and more concise." "His opinions are good. His government leaning shows. There is no chance taking for him." "His writing has a flair. He is talented." "His opinions are succinct. He gets to the point. There are few wasted words." "He writes well thought out opinions. They have good content. There is little legalese. They are very readable, but also very scholarly." "He writes with an agenda. His opinions are pro-government all the way. He almost helps them along."

Figure 2: *Histograms of Time-Aggregated (1993–2017) n-gram Scores for Four D.C. Circuit Republican-Appointed Judges*
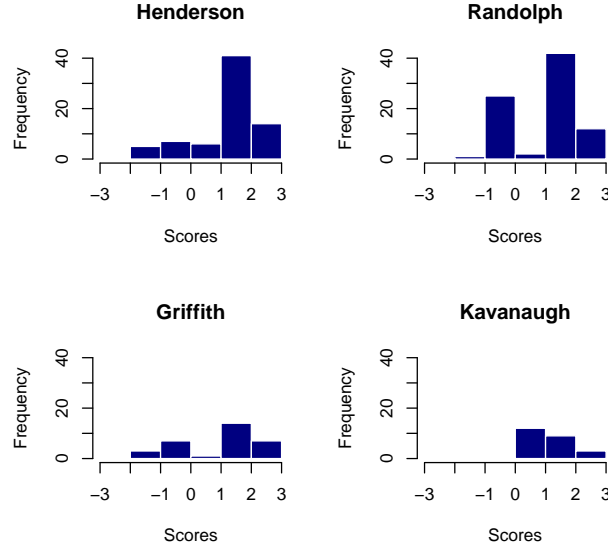
data, we generated term frequencies based on one-to-four-term phrases, or *n-grams*. This process generated 15,084 unique n-grams. All n-grams with frequency ≥ 2 were used to generate an n-gram list of 2,692 words and phrases. (See Appendix B.) From this list we coded terms according to a seven-point scale, from very liberal (-3) to very conservative (3). The other entries between the poles are liberal (-2), moderately liberal (-1), moderate (0), moderately conservative (1), and conservative (2). Both authors coded each of the n-grams, and they then reconciled differences.[11] This process produced 626 n-grams, each of which was assigned to one of the seven points on the scale.[12]

We created a hierarchical, rule-based regular expression dictionary. The hierarchical regular-expression model was essential to the coding because n-grams in our dictionary often have overlapping terms. For example, consider the descriptions of a conservative judge. We coded a description of "conservative" as 2, but "very conservative" as 3, and "moderately conservative" as 1. Given these terms, the dictionary would encounter three different versions of "conservative" and would need

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Almanac formatting lacked a clear separation between the descriptions of the judges' ideologies and the other attributes, making parsing much more labor-intensive. We plan to analyze the pre-1993 data shortly.

[11][Insert intercoder reliability index.]

[12]Thus, for ideology ideal point $X, \forall x \in X[-3, 3]$.

to distinguish the term modifiers. Without distinguishing modifiers, the algorithm would double-code some terms; for example, "very conservative" would receive both a 2 (for "conservative") and a 3 (for "very conservative"). This method would overcount the number of observations per entry, and the multiple scores for the same n-gram sequence would distort the ideology index. To circumvent this potential pitfall, the hierarchy of rules codes n-grams at the top of the hierarchy first. After the first rule is applied, the dictionary moves to the next n-gram sequence.[13] We generated an index score for each judge-year: the simple mean of n-gram scores for that judge-year.[14] For some analyses, we generated static ideal point scores for each of the judges by averaging their judge scores across all years for each individual judge.[15]

Figure 2 shows the distribution of evaluator scores for four typical circuit judges. Each is a Republican appointee (two by George H.W. Bush, and two by George W. Bush) on the D.C. Circuit, but each judge differs in mean ideology score, and in variance, i.e., how the scores is distributed. These histograms thus illustrate how the measure can be sensitive to minor variations in individual judges, even those appointed to the same court around the same time by the same political actor. The four judges are perceived differently by those most familiar with their ideologies, and the scores capture those differences.

2 Results and Initial Analysis

2.1 Descriptive Statistics

[*Note: This section is under development.*]

We applied this process to a set of pilot data from the Almanac records: the 378 active judges on the federal courts of appeals who served in any year between

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[13] In this hierarchy, we left entries with increasing modifiers at the top and moved less complex n-grams towards the bottom. Thus, the dictionary codes every instance of "very conservative" as 3 rather than taking the unigram "conservative" and separately coding it as 2. Once trained through human coding, our hierarchy of rules was able to analyze and accurately categorize these and many other more complex phrases.

[14]

$$\sum_{i=1}^{n} \frac{xs}{o[i_1...i_j]}$$

[15]

$$I = \frac{[Y_1 + Y_2...Y_j]}{n_i}$$

1993–2017. (See Appendix, forthcoming.) The two most conservative judges in our dataset are Donald Russell and Robert Chapman, both of whom served on the Fourth Circuit. The next two most conservative judges are from the D.C. Circuit – George MacKinnon and (now Chief Justice) John Roberts.[16] The D.C. Circuit is notable for containing judges sitting at extreme ends of the ideology spectrum. Given the most conservative judges in our data, it may not be surprising that the two most conservative circuits are the Fourth and D.C. Circuits, as Figure 3 shows.

Figure 3: Average Ideology Scores of Circuit Judges by Circuit, 1993–2017, normalized to mean = 0
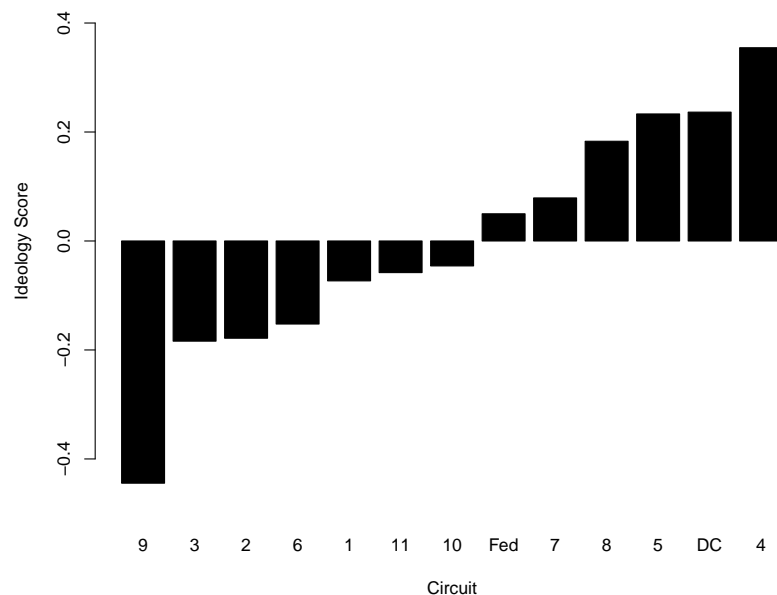
The notoriously liberal Ninth Circuit has some of the most liberal-ranking judges on the courts of appeals. Judges Betty Fletcher, Robert Boochever, and Richard Paez are all among the ten most liberal judges in our set. But the Ninth Circuit also has three judges in the group of the ten most conservative: Judges Melvin Brunetti,

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[16]One aspect that is clearly discernible from the extreme examples on the conservative and liberal ends of the spectrum is that their scores are based on limited observations. Lawyers were only surveyed once since 1993 about each of the judges mentioned above as well as the most liberal judge in the set, Judge Abner Mikva who previously sat on the D.C. Circuit.

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2.2 Preliminary Validation

[*Note: This section is under development.*]

Comparing our scores with those from established and recently developed datasets offers evidence of our method's validity. Because JCS and CBI are the only scores that provide robust coverage of circuit court judges, we use those two as comparisons. Figure 4 shows all the circuit judges included in both our data and in the JCS dataset. Figure 5 shows the same for CBI. As shown, the scores' correlation coefficients are $r = 0.68$ and $r = 0.56$, respectively.

Figure 4: Judicial Common Space vs. CF

r = 0.68
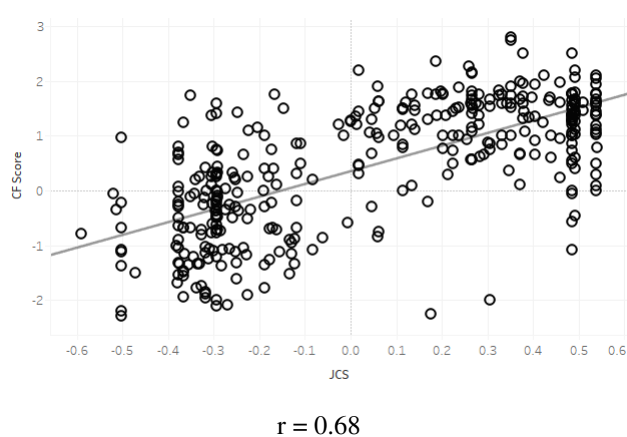
[*Note: This section is under development.*]

2.3 Potential Applications

After we finish developing and analyzing the data, we hope to use it to get additional leverage on questions that researchers across fields—courts, gender and racial politics, developmental psychology, American politics generally, and the empirical study of litigation—have been working to address.

How has the judiciary has changed over time? Given the truism that Democratic presidents generally attempt to install judges with liberal judicial ideologies, a valid measure should show a small but detectable liberalization of the judiciary over the course of Presidents Clinton's and Obama's terms. We should see the opposite

Figure 5: CBI vs. CF

r = 0.56
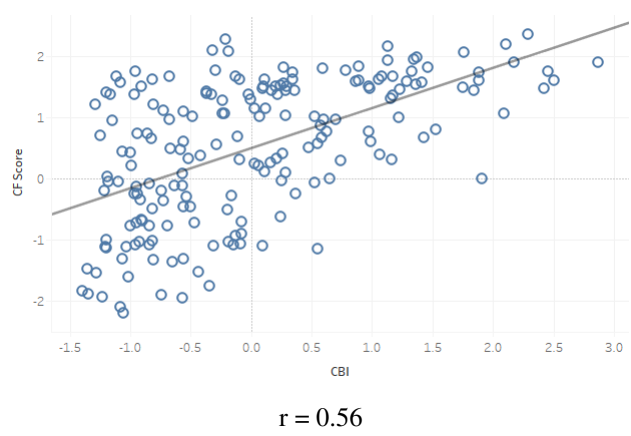
over President Bush's two terms. Figure 6 demonstrates that trend. More analysis is needed, but an OLS regression for each president's term shows changes in the expected directions.

Figure 6: Ideology of Average Circuit Judge Over Time
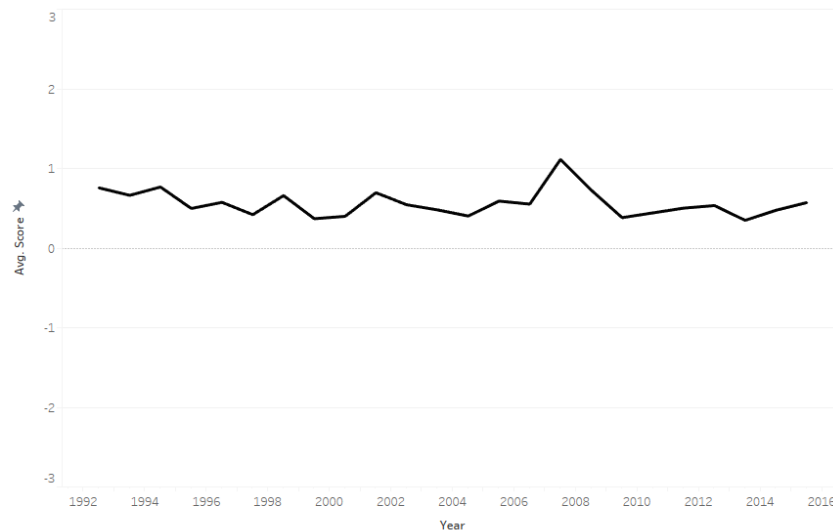
Some other potential questions that the AFJ scores would provide unique leverage on issues in the fields of judicial behavior, the empirical study of litigation, and American institutions. In judicial behavior, potential questions might include: Are legal ability and ideology correlated? With data survey responses on both of these character traits, we will be able to compare across these measures. How do

judicial traits such as ability and opinion quality change over time? What does the aggregate *aging curve*[17] look like for judges? With the five survey categories we have associated with all federal judges we will be able to expand the conception of judicial behavior to other judicial attributes. Do judges' ideologies tend to shift in one direction over the course of their tenure? Several Supreme Court justices (e.g., Brennan, Stevens, Souter) are thought to have become more liberal over time, but are these few cases unique these justices or to the Supreme Court, or do they reflect a general trend stemming from lifetime appointments? With data for thousands of judges over several decades, we could explore and test theories of ideology drift for federal judges in general. What predicts who will be an able/conservative/good-opinion-writing judge? That is, how do judicial traits such as ability, ideology, and opinion quality correlate with demographic traits (place of birth, college, law school, gender, and race) and experience (military, prosecution, academia)? With the extent and breadth of our data we can better probe the mechanisms that help define judicial behavior as well as the behavioral variables themselves. And re-latedly, what covariates (appointing president, divided government, race/sex/age, professional background) predict judicial quality?

For the empirical study of litigation, some issues the data might be used to address include: whether having a strong ideology predict high reversal rates for district court judges? And to what extent do district judges who are known for actively pushing settlement actually have more of their cases settled?

Finally, the data might be used to address important questions related to American institutions. For instance, how does divided government – that is, the political composition of the Senate and Presidency – affect the ideology of appointed judges (both circuit and district court)? How successful were different presidents – including Reagan, Bush I, Clinton, Bush II, and Obama – at changing the ideological composition of the federal judiciary? How polarized is the federal judiciary, and how does that compare with Congress? Has it changed over time, and if so, why?

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[17]For a discussion of its baseball counterpart, see https://mglbaseball.com/2016/12/21/a-new-method-of-constructing-more-accurate-aging-curves/.

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