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➤➤➤ The Importance of Data in the Context of Gender and Equity

The Positioning of Opinion Data in Equity-Advocacy Pipelines

By Moinak Bhaduri

Whatever the context, equality of outcomes, or even equity (an often misgrasped semantic neighbor) - in the broadest possible sense of the term - does not materialize out of thin air. Vital though it is, even prior to advocacy, it is *opinion* that function as the basic fuel to conjecture that equity (aside from its theoretical nicety - its presence in principle) ought to be pushed for in the first place. Collect opinion imprecisely, or analyze them incorrectly, and the rest of the chain suffers. Advocacy goes astray. Measures to attain equity get deployed, or craved, or perceived, in less-than-ideal ways. It is the central message of this essay that it may be worth paying attention to, or at a minimum, pointing out a deeper primacy - the existence of feelings, evidenced through numbers, their evolution, varieties, and other nuances - so subsequent steps get oriented in great ways.

Pick equity matters in a specific domain, such as work-life balance, just to be concrete (but this could well be salary, representation, or anything else). A key observation across current studies seems to suggest that women shoulder some disproportionate share of unpaid domestic and caregiving labor, apparently weakening their ability to achieve work-life balance on comparable terms with men (Chung and van der Lippe 2020, Sung and McNamee 2024). Several authors, with the best of intentions, take this almost as a given, i.e., as an axiomatic reality, using their (perhaps valid) social intuitions, and focus on the economic impacts of the imbalance (Goldin, Kerr and Olivetti 2024, Blau 2025). The calls for equity often develop stronger legs to stand on as a consequence of those economic impacts. I believe the recording of

concrete opinion, of perceptions and feelings of individuals who end up being the end beneficiaries of these calls, could function as a vital first step, augmenting these brands of studies. They could fix teething troubles around intuitions and causality (lack of work-life harmony *because of* imbalanced labor division) or further bolster the observation-economic impact-equity calls-reforms chain where the guiding intuitions were right anyway, thereby firming up advocacy through a rational, quantitative footing.

Now there are two sides. The *collection* of solid opinion data and the insightful *analysis* of those. With the first, especially the first, I have found collaborations help. Collaborations with organizations whose bread and butter it is to extract opinion in sound ways. This is crucial since unsound ways of data collection (such as through biased sampling) will, understandably, derail the analysis to follow. Obvious, yes. Obvious to the point of sounding silly, but still often unheeded, with devastating ramifications (Dietrich, Malerba, Gassmann, 2024). At Bentley, we have been teaming up with *Gallup*, and therefore receiving top-notch opinion data (three waves so far each with nearly 6000 respondents across the US) through our *Force for Good* survey. Maria Skaletsky and her ATC team have been doing an equally excellent job overseeing the fair and efficient use. Timely resources like these help shed fresh light on the equity concerns above on work-life balance, for instance, i.e., they make interesting *analyses* possible. Some questions on these surveys require respondents to reflect on, if companies required them to return to a five-day work week, or

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enforce a limit on work-emailing outside of the work-day, would those impact them positively?

This step - the use of data at all - though vital to me, is not especially novel per se. Some have sensed the need to look at survey data prior to informing policy decisions (though many, who rely on intuitions and still produce good work, by dint of the sheer clarity of those intuitions, have not) and report - maybe even model or predict, based on gender, age, race, etc. – the raw, traditional Likert scale responses. This is where the kind of analysis matters. Fresher ones could trigger fresher insights.

In a recent work, Bhaduri (2025a), I posit an observed response (say, agreeing “very strongly”) need not be taken at face value, but instead be seen as a byproduct of a feeling-unsureness tussle: everyone has an inherent perception of the topic, and an inherent unsureness towards it (inherent is the operative word, this is not observed fluctuations among manifested responses). Here is an excerpt:

“People who are sure of their outlook on returning to a five-day workweek, generally feel the move would impact them negatively, but the tendency is stronger for women than for men. ... In contrast, with limiting work-related matters outside of the workday, people who are very sure of their opinion, feel the move would impact them positively (with men typically less unsure), again, the connection being more strong for women workers. Institutions that are considering introducing a “right to disconnect” policy may use this result to work out which employees - at what times in their career - require improved work-life balance or reduced burnout. Follow-up studies can be conducted on these individuals to test whether their productivity or trust in their employers, increased. Similar patterns may be unearthed relative to the non-gender covariates:

politics, age, education, race, and - where ethically permissible – large-scale and nuanced policies may be formulated to boost public confidence and workers’ welfare. A hierarchy of employees’ priorities may be mapped, much along the lines shown by Smith and Bhaduri [8] through Maslow’s triangle-type diagrams.”

This hints at how, for certain issues, “concrete opinion” self-destructs. How, certain considerations routinely crop up that diffuse the concreteness of opinion. Social scientists and other experts may utilize this fact to fine-tune their equity goals. The above is a teaser, a shameless pitch to lure you into the main articles: Bhaduri (2025a, 2025b), where other subtleties on top of gender are highlighted (age, race, wealth, politics, etc.). I wrote in mathematically-minimal ways and the latter showcase other equity/ethical concerns like whether AI should be used to hire employees. Granted, the feeling-unsureness framework is non-standard, i.e., not an obvious line of checking whether responses stem from deeper shaky foundations (perhaps a reason why data scientists should get more involved in these matters). The basic point remains, though: it is an urge to use data innovatively that leads to the opening up of those checking possibilities.

The themes above are recent. One required the advent of AI, and the other, the going away of COVID. There are other works that revolve around classical centers that I invite you to: Bhaduri (2024), Zahirodini and Bhaduri (2025), through Markov random fields and Bayesian analysis, query whether the degrees of conditional dependence between “removing wage gaps between the workers and CEOs” and “making money in ethical ways” stay unchanged across gender and demographic divides, Zahirodini and Bhaduri (2026a) check whether social outliers - those who answer a “hard”

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question correctly, but an “easy” question incorrectly - vary across these gaps, Zahirodini and Bhaduri (2026b), where the order of questioning could have an impact on equity-related concerns. Some of these I wrote with my research assistant (a woman scholar in data science, interestingly) and you will find, in the references, other podcasts and expository pieces we penned on these things.

Given the (often overwhelming) data deluge we routinely endure these days, when nearly every discovery has some data backing, whether as a necessary scaffolding or a redundant prop, a question may be raised around why data are *especially* vital in gender-equity? Why are data genuinely important *here*? And the answer - and the philosophical fulcrum - hinge around the nature/complexity of “objects” we operate on, namely of human beings. In the physical sciences, for example, where a reasonably well-known number of forces acts on objects like atoms or planets or plants, data may aid the solidifying of facts, of technicalities, to deliver a neater, complete whole. In contrast, with complicated structures like human beings, where the nature, number, interactions of forces acting (an individual can be a certain gender, age, political mindset, and a ton of other things at the same time, which could on top of these, *vary* over time) are ill-understood, data could ensure the pointing out of potential, yet-unknown bridges - the forming of social conjectures in the

first place – in addition to the resolution of these matters.

Data - even though seemingly objective as the work-life balance study showed - are strictly not portals which supply a transparent view of the society as it is. They generate evidence - at times spurious, always incomplete (there could be infinitely many more conditioning variables behind the Markov fields in Bhaduri (2024)) - in support of leading ideologies and existing social arrangements. They could confirm - and equally fabricate - those myths and arrangements. The function of *analyzing* these data is to offer up a proper (i.e., correct) and efficient (i.e., maximally condensed) description of what is going on, minimizing information wastage. Such analyses, such tokens of culture fragments, could represent a society as it submits to the imperatives of time.

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About the Author



Moinak Bhaduri is currently an associate professor in the Department of Mathematical Sciences at Bentley University in Massachusetts. Rooted in applied probability, he studies spatio-temporal Poisson processes and others, such as the self-exciting Hawkes or log-Gaussian Cox processes that are natural generalizations. His primary interests include developing change-detection algorithms in systems modeled by these stochastic processes, especially through trend permutations. His research has found applications in computer science, finance, reliability and repairable systems, physical and social sciences. Moinak heads the editorial board of the NextGen column of the New England Journal of Statistics in Data Science.

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