Cosette L. Hampton, Fall 2018
MACS 3000, Dr. Evans
Due Monday, Nov. 26 at 11:30am

1. **Unit Testing in Python (3 points)**

   Please see the folders A7_Q1_p1, A7_Q1_p2, and A7_Q1_p3 for the code and html
   document test result answers to Problems 1, 2 and 3 from Humpherys and Jarvis (2018,
   Ch. 7).

   In Problem 1 I renamed the original function to "w_smallest_factor(n)" to signify that
   this is the incorrect function, and the corrected function was named
   "smallest_factor(n)". The primary issue was returning "n" instead of "i" and not adding
   1 to the top of the range. The functions are in one module and the test is in another
   named Q1.py and Q1_test.py respectively.

   In Problem 2, I included a screenshot of my terminal to show the original error, and the
   htmlcov file to show that I achieved 100% coverage for the function in Q2.py and the
   test in Q2_test.py.

   In Problem 3 I tested all the exceptions in a comprehensive unit test called Q3_test and
   achieved 100% coverage as shown in the htmlcov folder within the A7_Q1_p3 folder.

2. **Test driven development (3 points).**

   Using get_r.py module and test_r.py module in the folder A7_Q2, I achieved 100%
   coverage (see the htmlcov folder). My function passed all of the test.

3. **Watts (2014) (4 points).**

   Duncan J. Watts describes rational choice theory as a "sociological theory of
   action" (Watts, p. 314) that sociologists, psychologists, political scientists and
   economists use to describe people's actions based on what is "rational" or what they
   people understand to be "common sense." Early explanations of rational choice theory
   used causal claims to make predictions about peoples' actions. Criticisms of rational
   choice theory collected around the idea that these predictions may conflict with
   empirical evidence, or findings gathered by observational study and experimentation.
   Many of the documented critiques of rational choice theory Watts referred to saw this
   conflict as a function of oversimplification of assumptions about the reasons why people
   do things, or "…the preferences, knowledge, computational capabilities of the actors in
   question…" (Watts, p. 320).

Later developments of rational choice theory attempted to increase "empirical relevance" (p. 321) by shifting its view as an approach used to orient thinkers rather than a direct path to making causal inferences of behaviors and actions. As in concert with the ongoing notion in this paper, Watts asserts that criticisms of rational choice theory assert that it over-emphasizes "understandability" and "sense making," in turn conflating scientific outcomes and empathetic outcomes (Watts, p. 321). When describing individualistic social action under Lukes' criticisms, a broader criticism can be drawn to rational choice theory, stating that rational choice theorists explain actions with causal inference based on what can be understood, perhaps without enough context and being too reductive to actually imply certain reasons are causal relative to actions taken (Watts, p. 322).

These criticisms of rational choice theory help illuminate Watts' main criticisms of commonsense theories of action. Watts sets up his discussion of commonsense theories of action using "mental simulation" to describe how when people predict how situations will play out or how people will act, they use their own knowledge and experiences, and what they know about the person or situation in question, to either predict, or to understand an action or situation (Watts, p. 326). The consequences are that people may interpret actions or situations incorrectly, or even if not a matter of something being right or wrong, they interpret actions or situations ***differently***, or as Watts describes, "…differing [only in terms] of the temporal vantage point—ex ante versus ex post—at which they are carried out" (Watts, p. 327).

When reading this ***I*** also thought about what people think they know about other people and other people's living situations and experiences if the only thing they have to glean information from is from literature, observation, and (admittedly, even better) discussion. Nevertheless, even these sources of information may not be sufficient to really describe reasoning and intentions behind people's actions—societal examples of this are reasons behind stereotypes—what is "familiar" about people and situations enough to be universally applied (Watts, p. 331), and self-fulfilling prophecies (Watts, p. 342) as with the widely known example of teacher's views about student influencing academic performance. Watts goes forward discussing how other sociologists saw commonsense theories in a way such that, "…even when not universally valid, are generally valid in everyday situations" (Watts, p. 327). Watts believes the generalization is useful to make sense of, predict, and perhaps alter behavior, but again the issue is that it is also based on what can be understood using commonsense instead of actual causality—which are not interchangeable Watts, p. 327).

Watts suggests that in order to deal with issues arising from using rational choice modeling and causality, practitioners should take on a variety of partial solutions. Generally, sociologists should address the difference between empathetic and causal explanations so that the two are not conflated as they have historically been. More specifically, they should rely on more "experimental methods" (Watts, p. 335) that use random assignment or at least naturally occurring randomness, or when impossible, "the counterfactual model of causal inference" (Watts, p. 336) and out-of-sample testing (Watts, p. 344). This model helps increase the size of nonexperimental data,

which helps with the overall goal of both this and randomization: to increase generalizability which enhances prediction accuracy.

In Watts' conclusion he explains however, that even this solution may just expose even more contentions between casual explanation and scientifically valid explanations because there is a limit on what is a feasible amount of explanations and options to consider when constructing a "reason" for actions and outcomes. One cannot include every single little detail in the universe. Generally, a hypothesis must be weak enough to survive the scrutiny of testing and data manipulation (Watts, p. 343).

Finally, though assumptions and mechanisms of process can be misleading at times, they may be necessary to simplify general actions and occurrences that help improve causal inference and prediction, according to Dr. Evans. Theories are information that can be gleaned from, as discussed earlier, various types of experiments, literature, media and even conversation. Scholars construct theories of social interaction and individual activity based on these sources of knowledge and information, and they can help sociologists go beyond their own mental simulation of actions and situations, or their own understanding of things, to apply more rigorous and universally applicable reasonings. Also, sometimes individual actions are not always connected to collective actions for the same reasons, but theories can help distinguish between collective and individual action through pedagogical content, so that actions and situations that are outside of the everyday situation can be understood via theories by using contextual understanding even when context is not immediately available or accessible at all, as is the case with some sociological experimentation with controversial things or human subjects ethics issues.

References

Watts, Duncan J., "Common Sense and Sociological Explanations," *American Journal of Sociology,* September 2014, *120* (2), 313-351.