Evaluation of PhD thesis "Essays on Decision Making Under Uncertainty"
by Sasha Prokosheva.

Let me start by saying that I am not acquainted with the typical structure of a PhD thesis at the CERGE-EI. Most dissertations I have seen so far differ in two aspects from this thesis. First, they have a separate introduction and conclusion that span across all paper-chapters, and, second, they consist of at least three chapters that are based on original research and analyses, while the introduction (or a fourth chapter) provide a literature overview or survey paper much like chapter three in this thesis. In this evaluation I take the structure of the thesis as a given and restrict my comments to the contents of the three chapters (papers). I do think, however, that the thesis could gain a lot from a separate introduction and conclusion, which show how the candidate's combined work contributes to the academic discussion. (Maybe the preface can be extended into a longer introduction to the chapters.)

In the following, I comment on each chapter separately and chronologically and then provide a general evaluation of the whole thesis at the end.

Chapter 1

Page 1 footnote 1: Who else are the co-authors of this chapter? You mention Ortmann *et al* and Rydval *et al*. Are these the only co-authors? Please specify for each chapter which co-author contributed what to the paper.
Page 2: In the third paragraph you jump very quickly to your own study. It would be nice to have more theory and motivation for your design and changes that you make with respect to GLW. Why do you think that the results of GLW can be improved? Why do you think that misinterpretation and physical lotteries are the design features that should improve GLW?
Page 5: The same point applies here. I am lacking a motivation why you vary the incentivisation from gift certificates to cash payments. I can see that this makes a difference and indeed it is very well possible that book vouchers are conceived very differently as incentivisation but without motivation of this design feature the reason for inclusion is not clear. Also, the whole section is difficult to follow, because there's no clear overview over the different treatments and changes between them. I suggest that you start by motivating the different treatment effects and then show how they are implemented in design and administered across treatments T1 to T8.
Page 6 & 7: You end the design section with a discussion of the literature which should either be in the introduction, or in a separate overview of the literature section (as in your second chapter), or should be used at the beginning of the design section to motivate your treatment effects. As it stands now (at the end of the design section), the literature does not add much to the understanding of your paper.
Page 11 (Results section in general): Given that the authors acknowledge that there could be differences between sessions because of sampling I would expect the analyses to include ordinary least squares regressions (or random effects regressions) which correct for demographic idiosyncrasies of participants and samples. I think this was even mentioned somewhere in the text but I cannot find any corresponding analysis. For example, as a

robustness check, the gift voucher could be used as a dependent variable with demographics as independent variables and a dummy for the treatment effect (which is equivalent to a session dummy). If the results are mainly driven by, for example, gender then we would not expect any statistical significance on the treatment dummy. The results of the chapter could gain even more credibility with such regressions as robustness check.
Page 16 second to last paragraph: I do not understand the sentence starting with “As noted in Section 3, …”

Chapter 2

Page 40: I suggest you bring footnote 3 up into the text as it is quite important to understand compound lottery reduction in ambiguity models. Also, on this page in the introduction or, alternatively, in the literature review I would make it clear reference to multiple prior models and how they deal with compound lottery reduction, that is the aggregation of multiple priors. Here, you might also want to refer to Qiu and Weitzel (forthcoming), experimentally test multiple prior aggregation. See here:
http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2706129
Page 41: Please be a more specific on the results of the related with literature in the top paragraph. For example, you mention a close relationship between RoCL and attitudes toward ambiguity. It is not clear what a close relationship means. Also, why does a weaker association between ambiguity neutrality and RoCL lead to the question you then pose in the next sentence?
Page 42: In the last paragraph you make the assumption that a lottery with second-order probabilities is a convenient way to design ambiguity. I think this assumption needs more motivation, particularly as you set out to compare compound lotteries with ambiguity.
Also, keep in mind that a simple second-order lottery does not fulfill the criterion that you mention as quote from Ellsberg on p.84: ”Let us imagine a situation in which so many of the probability judgments an individual can bring to bear upon a particular problem are either ”vague" or “unsure" that his confidence in a particular assignment of probabilities, as opposed to some other of a set of “reasonable" distributions, is very low. We may define this as a situation of high ambiguity.” Thus, if you administer ambiguity with a simple second-order lottery it is likely that it is so unambiguous and similar with the risky compound version that you don't find any difference between the two. In fact, this is what you also find in the results (see, e.g., mean and median of Lc and La in Table 2.5). So, a critical reader might rightfully claim that you compare one particular simple version of a compound lottery with another simple version, but not real ambiguity with a compound lottery. I realize that many of these distinctions are rather philosophical but this is exactly the reason why your choice of ambiguity measurement should be motivated in more detail. Also, this issue may be discussed in more detail as a possible limitation in the conclusion.
Page 47: I like the idea wth containers and bags but it is not clear how the compound lottery is created. Do you flip a coin to determine from which of the two bags (one with 1 blue and 3 red and one with 3 red and 1 blue) the draw is going to be done? Please explain in more detail.

Page 48: Please motivate the choice of your cognitive skill tests as there are a number of others (some of them mentioned in chapter 3) that could have been used and are also more frequently used recently (like e.g. the Cognitive Reflection Test or the Raven's matrix).
Under the section incentives, please explain how the prospects are evaluated. Later in the section you mention MPL, but the exact design is not discussed.
You write "Therefore, in my lottery experiment everyone was paid a participation fee (100CZK $5 at time of experiment), which also served as an incentive for AT and WMT, and for one random task …". Not clear. How did this work in detail? Specify.
Page 49: You write "Then every subject drew a line in her MPL to be played for real" which sounds as if the subjects were able to choose for the line they would like to be played out. This would not be incentive compatible. In the instructions you mention that the line is drawn randomly, which would be the correct way. Please explain in more detail.
What happens if you keep the subjects with inconsistent answers in the sample and treat them like, e.g., Holt and Laury (2002), that is, simply count the number of choices on the left and on the right? Would be good to see some robustness check on this in the appendix over and above the different thresholds, which you already provide in Appendix E.
Page 50 and rest of results: I wonder why almost all of your analyses (everything after Table 2.7) are based on very sharply defined dummies (AmbN & RoCL) while you have very rich continuous data on relative attitudes toward compound risk and ambiguity (Lr-Lc and Lr-La). I realize that you want to stay comparable with other studies but with this sharp coding you lose all information on subjects that are very close to ambiguity-neutrality but just not equal and so on. It would be good to see some robustness checks with either some slack around the very sharp definitions for dummies or more analyses on the continuous variables as defined in Table 2.4 (particularly CArel and AArel).
Also, in the results section and/or conclusions, please analyze and discuss the very similar values for Lc and La and CArel and AArel. This is an important limitation of your design as it is possible that the two different treatments for compound lottery and ambiguity are too similar for the purpose of the study. THis also has implications for the results of the dummies AmbN and RoCL, because they may then be artefacts of their very sharp definitions, but as soon as you allow for some noise, the results may not be robust.
In the 3rd para on page 50 you mention the literature on the (mixed) relationship between risk and ambiguity. You also discuss this in more detail in chapter three. Please refer to chapter three at this point (or earlier) and stress that the relationship is not straightforward.
Page 52 and 54 in combination: I am confused about the role of cognitive skills. At some points on these two pages you claim that cognitive skills and/or AT have an effect and then again I think I read out of the text that they don't. Please clarify. Also, what is your measurement of cognitive skill when you refer to it as 'cognitive skill'? The AT, the WMT or the study major, or all together?

Chapter 3

Page 81 (abstract): 2nd-to-last sentence reads as if shifts to ambiguity-neutrality are per se inconsistent. Please clarify.

Page 82: You mention a large world problem (small world problem). Please explain in more detial what is meant with this discussion and why it is important here.
Page 85 & 86: Please use the contradictory results on risk and ambiguity mentioned in section 3.3.1 for chapter 2 r cross-reference between the chapters.
Page 86 section 3.3.2: you write “For experimentalists, compound (two-stage) lotteries are a convenient way to design ambiguity in experiments.” I am not sure whether I would support this claim without further explanation. in fact, I think that most experimentalists actually try not to use compound lotteries to operationalize ambiguity in the lab (see also Trautmann and van Kuilen survey and other surveys).
Page 87: “Overall, studies suggest that there is no clear-cut relationship between preferences to ambiguity and compound risk.” This is exactly why your design in chapter 2 and also your results in chapter 2 (clear positive correlation between risk and [very similar] ‘ambiguity’) need more discussion. Normally results on this relationship are not as clear-cut as yours and may be due to the very similar ambiguity and compound risk designs.
Page 96: On ambiguity and learning you also might want to cite
http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2207413
Page 100: To my understanding people overweight extreme events. They are less sensitive to changes in probabilities in the middle range but more sensitive than normatively assumed by EU in very low probability events. Please check and rewrite sentence under “2) Peer effects”. Also, under “3) Herding” I would include other correlation patterns.Herding is a quite specific pattern (momentum) but it is also possible that people are too insensitive or stubborn with regard to information of others and underweight informative signals in their updating.
Page 101: The chapter’s conclusions end somehow abruptly. It would be nice to have a finalizing paragraph or two.

General conclusion

Sasha Prokosheva’s thesis “Essays on Decision Making Under Uncertainty” contains solid experimental research and represents a laudable attempt to answer important and yet unanswered questions in the area. The experiments are thoroughly designed, executed and analyzed and the survey chapter provides a creative and very helpful structure to bring some order into the chaos of determinants in decision making under ambiguity. The thesis is well written and the author shows that she has a very good understanding of the relevant literature and research in the field.

There are, of course, also a few areas for general improvement. First, throughout the thesis I would appreciate more motivation, either grounded in theory or in prior literature, for the choices made in either experimental design or analyses. This particularly applies to chapter 2 but also - to a lesser extent- elsewhere. Second, the thesis would gain a lot from a more detailed general introduction which motivates the topic and individual papers, and from a general conclusion which discusses general limitations of the chapters/designs and also delineates areas and possible implications for future research. A limitations section, in some of the chapters and across chapters, is also important to protect the author from criticism on design and other issues that cannot be addressed anymore after having run the experiments. Finally, I lack some more general insight of the presented research and results. The thesis makes a strong point that many of the previous findings in ambiguity and uncertainty research are contextual. This is an important point, but simply saying that something is contextual is not very novel or helpful. In fact, it would be nice if the thesis could end with some more insight on the common characteristics of contextual factors that might drive results in the one or other direction. The author makes an attempt in this direction in the conclusion of chapter 3. It would help the reader to broaden this view across chapters and to offer insights across the different contexts that were researched.

On the basis of the above evaluation I conclude that the thesis satisfies the formal and content requirements for a PhD thesis in economics, and therefore I recommend the dissertation for a defense.

Please do not hesitate to contact me should you require any further information.

Kind regards,

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