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For: Paper Submission for Participation in FTC PrivacyCon

Dear Organizers of the FTC PrivacyCon,

We, Yu Pu and Jens Grossklags, herewith submit our research article "Towards a Model on the Factors Influencing Social App Users' Valuation of Interdependent Privacy" to be considered for a presentation and discussion at PrivacyCon. Our work has been rigorously peer-reviewed and was presented at the Privacy Enhancing Technologies Symposium (PETS) on July 2016 (which is also associated with a publication in the journal Proceedings of Privacy Enhancing Technologies (PoPETs)). PETS is a leading conference in the field of privacy research.

The vast majority of published research on privacy-decision making focuses on individual choices regarding personal privacy. However, with the accelerating usage of Social Network Sites (SNSs), mobile platforms and other digital advances with interactive tools, we observe the increasing prevalence of scenarios impacting *interdependent privacy*, in which a decision-maker has power over the sharing of personal information about other individuals, who in turn often have only very limited abilities to restrict such sharing.

Our study is concerned with interdependent privacy issues associated with third-party apps on SNSs. More specifically, we consider the scenario of third-party app adoption on SNSs where users are presented with app offers and associated authorization dialogues which may trigger sharing decisions over their own personal information and their friends' personal information.

In the study submitted for consideration, we quantify the monetary value which app users attribute to their friends' information (i.e., value of interdependent privacy) and investigate how this valuation is affected by data collection contexts (i.e., whether friends' information is necessary for apps' functionality). In addition, we investigate how other factors, such as privacy concerns, online social capital, and past privacy experiences, affect interdependent privacy valuations by applying structural equation modeling (SEM) analysis.

Our study directly addresses the following main topic of interest in the call for presentations: **Quantifying Consumers' Privacy & Security Interests**, and the issue of **Valuations of Privacy**. With our research, we further contribute to the broader technology policy discussion on app privacy. We observe that data collection context (i.e., whether or not data collection is relevant to apps' stated purposes) plays a role in how app users valuate friends' information. This indicates that explicitly informing users whether apps' practices of collecting data is necessary for the app's functionality can serve as a viable way to protect friends' privacy. In addition, we find app users can be considered as "privacy egoists" in that they associate a relatively low value with the information of others. Therefore, it may be necessary to limit the data sharing of friends' information, or to increase the involvement of users in the decision-making process over information sharing initiated by others.

In the following, we provide the elements requested in the call for participation:

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Abstract:

In the context of third-party social apps, the problem of interdependency of privacy refers to users making app adoption decisions which cause the collection and utilization of personal information of users' friends. In contrast, users' friends have typically little or no direct influence over these decision-making processes.

We conduct a conjoint analysis study with two treatment conditions which vary the app data collection context (i.e., to which degree the functionality of the app makes it necessary for the app developer to collect friends' information). Analyzing the data, we are able to quantify the monetary value which app users place on their friends' and their own personal information in each context. Combining these valuations with the responses to a comprehensive survey, we apply structural equation modeling (SEM) analysis to investigate the roles of privacy concern, its antecedents, as well as app data collection context to work towards a model of interdependent privacy for the scenario of third-party social app adoption.

We find that individuals past experiences regarding privacy invasions are negatively associated with their trust for third-party social apps proper handling of their personal information, which in turn influences their concerns for their own privacy associated with third-party social apps. In addition, positive effects of users' privacy knowledge on concerns for their own privacy and concerns for friends' privacy regarding app adoption are partially supported. These privacy concerns are further found to affect how users value their own and their friends' personal information. However, we are unable to support an association between users' online social capital and their concerns for friends' privacy. Nor do we have enough evidence to show that treatment conditions moderate the association between the concern for friends' personal information and the value of such information in app adoption contexts.

Findings to be presented:

- Explanation of the problem of interdependent privacy with data from social app markets and social network sites
- Recap of prior literature on the topic of quantifying consumers' *personal* privacy
- Review of research studies which shed light at consumers' understanding of *interdependent* privacy problems including interaction studies and surveys
- Discussion of our findings on how individuals value the information of their online connections and how this valuation is affected by important contextual factors, such as relevance of data collection and sharing anonymity
- Presentation of our behavioral model (and statistical results) on how factors such as individuals' privacy preferences, previous privacy invasion experiences, and privacy knowledge, affect consumers' valuation of interdependent privacy
- Introduction of the research topic on the association between online social capital and interdependent privacy preferences, and discussion of our preliminary results regarding this relationship
- Discussion of implications of our work for technology policy, and privacy by design

Methodology:

- Online survey which includes demographic questions, an embedded trade-off task (i.e., conjoint study approach), and items about consumers' preferences, past privacy experiences and other important factors
- Conjoint study approach to quantify the monetary value which app users place on their friends
- Between-subject experimental design to investigate influences of contextual factors, such as data collection context, on app users' privacy valuation of friends' information
- Structured equations modeling to explain how the valuation of interdependent privacy is affected by important consumer characteristics such as individual's online social capital and individual

Novelty:

- Our paper is one of the first attempts to quantify the value of interdependent privacy in the scenario of social app adoption from the behavioral and empirical perspectives
- To the best of our knowledge, there is only very scarce published research addressing the relationship between interdependent privacy concerns and other constructs, or explaining the (monetary) value of friends' personal information. Our works address this literature gap.

- There is an interest in interdependent privacy issues in the communities of genetic privacy research (see, for example, the GenoPri workshop series), and big data privacy.

We would welcome the opportunity to present our research at PrivacyCon. Thank you for considering our submission.

With best regards,
Jens Grossklags