

Chen, Yiling; Sheffet, Or; Vadhan, Salil**Privacy games.** (English) [\[Zbl 1404.91001\]](#)

Liu, Tie-Yan (ed.) et al., Web and internet economics. 10th international conference, WINE 2014, Beijing, China, December 14–17, 2014. Proceedings. Cham: Springer (ISBN 978-3-319-13128-3/pbk). Lecture Notes in Computer Science 8877, 371-385 (2014).

Summary: The problem of analyzing the effect of privacy concerns on the behavior of selfish utility-maximizing agents has received much attention lately. Privacy concerns are often modeled by altering the utility functions of agents to consider also their privacy loss [*D. Xiao*, in: Proceedings of the 4th conference on innovations in theoretical computer science, ITCS'13. New York, NY: Association for Computing Machinery (ACM). 67–86 (2013; [Zbl 1361.68076](#)); *A. Ghosh* and *A. Roth*, Games Econ. Behav. 91, 334–346 (2015; [Zbl 1318.91093](#)); *K. Nissim* et al., “Privacy-aware mechanism design”, in: Proceedings of the 13th ACM conference on electronic commerce, EC'12. New York, NY: Association for Computing Machinery (ACM). 774–789 (2012; [doi:10.1145/2229012.2229073](#)); *Y. Chen* et al., “Truthful mechanisms for agents that value privacy”, in: Proceedings of the 14th ACM conference on electronic commerce, EC'13. New York, NY: Association for Computing Machinery (ACM). 215–232 (2013; [doi:10.1145/2492002.2482549](#))]. Such privacy aware agents prefer to take a randomized strategy even in very simple games in which non-privacy aware agents play pure strategies. In some cases, the behavior of privacy aware agents follows the framework of randomized response, a well-known mechanism that preserves differential privacy.

Our work is aimed at better understanding the behavior of agents in settings where their privacy concerns are explicitly given. We consider a toy setting where agent A , in an attempt to discover the secret type of agent B , offers B a gift that one type of B agent likes and the other type dislikes. As opposed to previous works, B 's incentive to keep her type a secret isn't the result of “hardwiring” B 's utility function to consider privacy, but rather takes the form of a payment between B and A . We investigate three different types of payment functions and analyze B 's behavior in each of the resulting games. As we show, under some payments, B 's behavior is very different than the behavior of agents with hardwired privacy concerns and might even be deterministic. Under a different payment we show that B 's BNE strategy does fall into the framework of randomized response.

For the entire collection see [[Zbl 1302.68013](#)].

MSC:[91A05](#) 2-person games[91B26](#) Auctions, bargaining, bidding and selling, and other market modelsCited in **2** Documents**Keywords:**

privacy concerns; utility functions; privacy game; coupon game

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