Measuring the Moral Impact of Operating „Drones“ on Pilots in Combat, Disaster Management and Surveillance

Markus Christen*, Michael Villano2, Darcia Narvaez2, Jesús Serrano2, Charles R. Crowell2

Methodology and Setup of Simulation

Our study consists of a between-subject-design that includes five steps outlined in the Table below. Our methodology involves not only several measures for stress components (perceived stress reactivity, heart rate) and traits, but includes novel measurement tools to assess moral reasoning. The whole experiment takes part in an acoustic booth that includes a large 60’ LED monitor to ensure immersion. The experiment includes an RPA simulation based on a game engine and novel measurement tools to assess moral reasoning. Here we outline the design of the experiment, the results of pretests that demonstrate the sensitivity of our measures for the purpose of our study and preliminary results of the ongoing main study.

Introduction

Research on human-RPA interaction concerns the efficiency of RPA operation and thus capacities like executive function and cognition. But several studies (references see paper) indicate an unforeseen impact on RPA pilots. They report anxiety, depression, and post-traumatic stress induced by constant exposure to high-resolution images of real-time killing. A study by the US Armed Forces Health Surveillance found that, among RPA pilots, the incidence of stress disorders is similar to those who pilot manned aircraft. Disasters, however, have embedded it in three scenarios (military, disaster management, surveillance) where RPA pilots operate a simulated drone in defined missions. We hypothesize that tragic decisions that are embedded in a military context (perceived stress reactivity, heart rate) and traits, but includes novel measurement tools to assess moral reasoning. The simulation was created using Valve Software’s Source SDK Base 2013 game engine and development tools.

Hypothesis

We suggest that “moral stress” may partly explain these findings. We conceptualize “moral stress” as being involved in decisions with high moral relevance without physiologically experiencing the situational factors that allow for “dealing” with the consequences. We furthermore suggest that these decisions have the potential to change the evaluation of values and reasons that are relevant for the decision problem. In our experiment, we have adopted the Trolley Dilemma, where people can benefit one or more persons (of different social rank) at the cost of harming others – and we have embedded it in three scenarios (military, disaster management, surveillance) where RPA pilots operate a simulated drone in defined missions. We hypothesize that tragic decisions that are embedded in a military context (perceived stress reactivity, heart rate) and traits, but includes novel measurement tools to assess moral reasoning. The simulation created using Valve Software’s Source SDK Base 2013 game engine and development tools.

Step 1 Preparatory phase: informed consent, briefing, installation of the participant in the experimental booth.
Step 2 Survey part 1: General information, state and trait measures.
Step 4 Survey part 2: reason and value test, state measures.
Step 5 Debriefing using a semi-structured interview.

Our participants will have the role of the RPA pilot, i.e. they will guide the RPA to the optimal launch point of the missile and they will keep the target in crosshairs. They do not decide whether the target is legitimate (task of the sensor intelligence coordinator); however, they can shift the missile target to an alternative target (resulting in collateral damage).

Preliminary Results

The study is ongoing, we report preliminary results of in total 38 participants (24 military scenario and 14 firefighter scenario).

- There are remarkable differences in the decisions made: soldiers are much more often spared in military settings (e.g., 83% spared a family member in the military setting compared to only 43% in the disaster management scenario).
- Pre-post aggression comparison shows an increase only in the military scenario.
- So far, no significant scenario-related differences show up in moral reasoning, but non-redirecters (killing five for saving one) show several significant differences (e.g. obedience is considered to be “more moral”).

*Contact: christen@ethik.uzh.ch
2 Department of Psychology, University of Notre Dame, Notre Dame, Indiana, USA

University of Zurich

Markus Christen*/one.superior, Michael Villano/two.superior, Darcia Narvaez/two.superior, Jesùs Serrano/two.superior, Charles R. Crowell/two.superior

Dame, Indiana, USA

University Research Priority Program Ethics, University of Zurich, Zurich, Switzerland