

Introduction: Many studies have shown downward trends in violent crime in western societies over the last 10-20 years. The present study focuses on trends in less extreme aggression. The study is divided into two parts, both assessing time effects on physical and non-physical aggressive behavior. In Part I, we assessed the influence of a continuous measure of time, while controlling for age effects. In Part II, we compared two birth cohorts, born before 1980, or after/in 1980, allowing us to compare age-aggression trajectories between two groups that grew up in different time periods, with different technological, demographic, and policy environments. The aim of this study is to answer our main research question: *How have trends in aggressive behavior developed in the Netherlands between 1991 and 2015?*

Methods

Sample: Our study is divided into two parts. For both parts a sample is drawn from the Netherlands Twin Register (NTR).

For part I, we drew a sample of over 40,000 twins and family members with data on physical or non-physical aggression, aged between 12-70 years old.

For part II of our study, we drew a sample of over 27,000 twins and family members from two birth cohorts; Cohort 1: born before 1980, Cohort 2: born in/after 1980. Only respondents aged 13 – 33 years old were included, as younger and older ages were unavailable in one, or both cohorts.

Measures: Self reported data on aggressive behavior were collected between 1991 and 2015. Nine items from the ASEBA aggressive behavior subscale that were available on each of six measurement occasions were included in the analyses. Physical aggressive behavior comprised of 3 items, non-physical aggressive behavior of 6 items.

Analyses: For both parts of the study we employed mixed effects models in *R*. In Part I, year of assessment, age, and gender were included as fixed effects. A random intercept was included for family and individual to take into account the nested data structure. The same mixed effects models were employed for Part II. However, instead of year of assessment, cohort effects were added to the model.

Results I – Time effects

Figure 1. Time effects – physical aggression

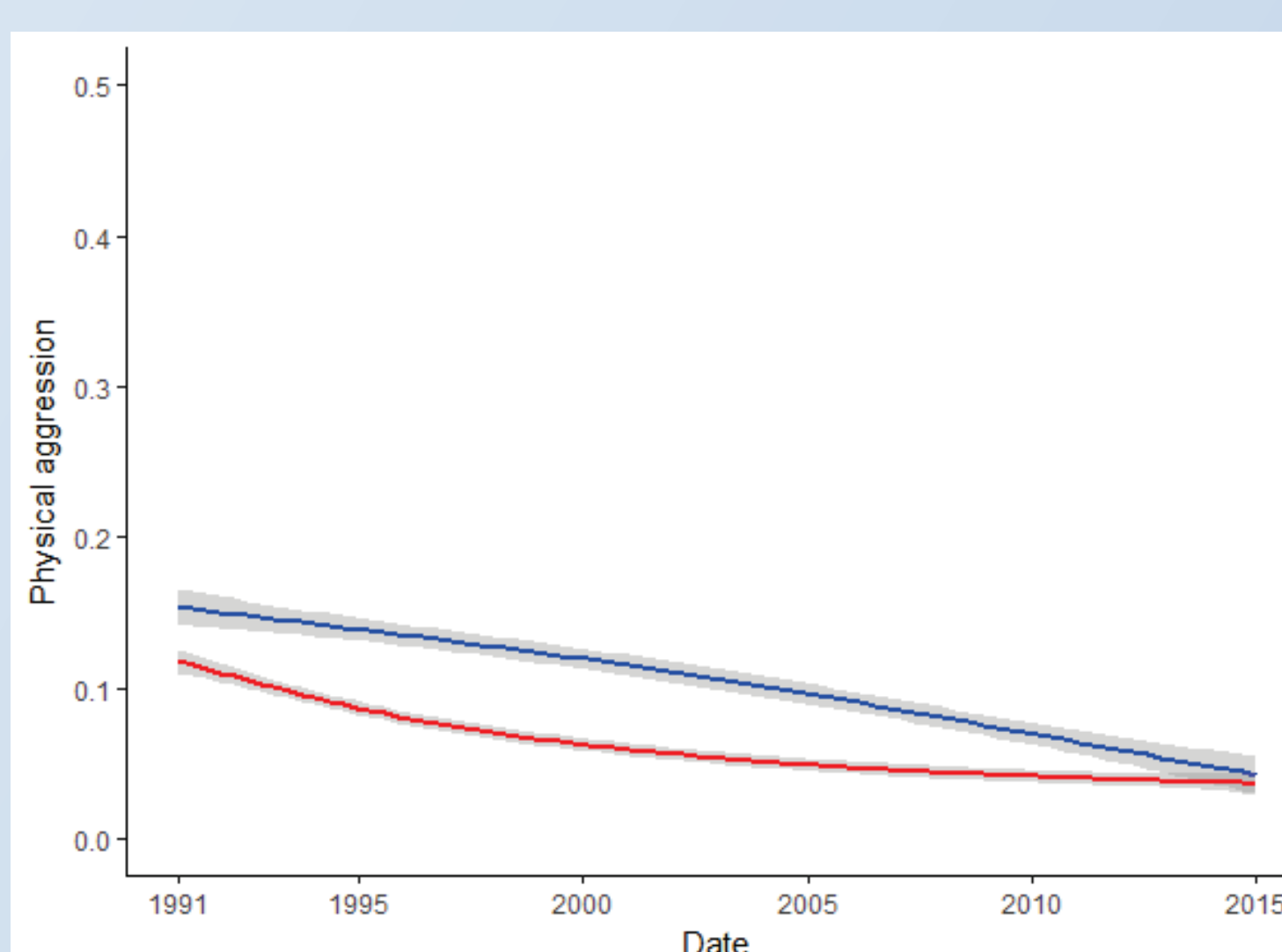
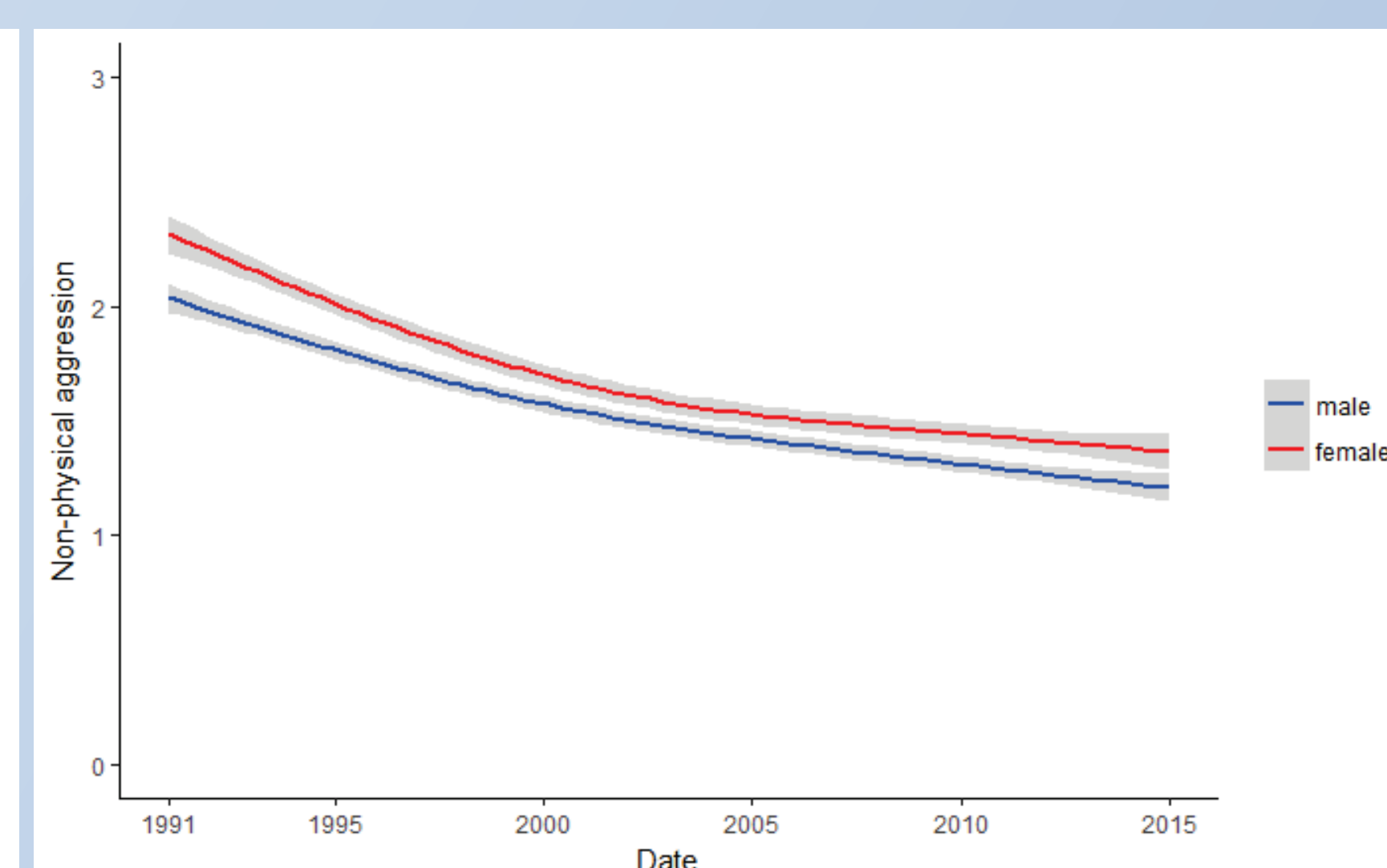


Figure 2. Time effects – non-physical aggression



Results suggest a decline in both physical (Figure 1) and non-physical (Figure 2) aggressive behavior between 1991 and 2015. Females scored slightly higher on non-physical aggressive behavior, males on physical aggressive behavior. Gender differences were relatively stable over time.

Results II – Cohort effects

Figure 3. Cohort effects – physical aggression

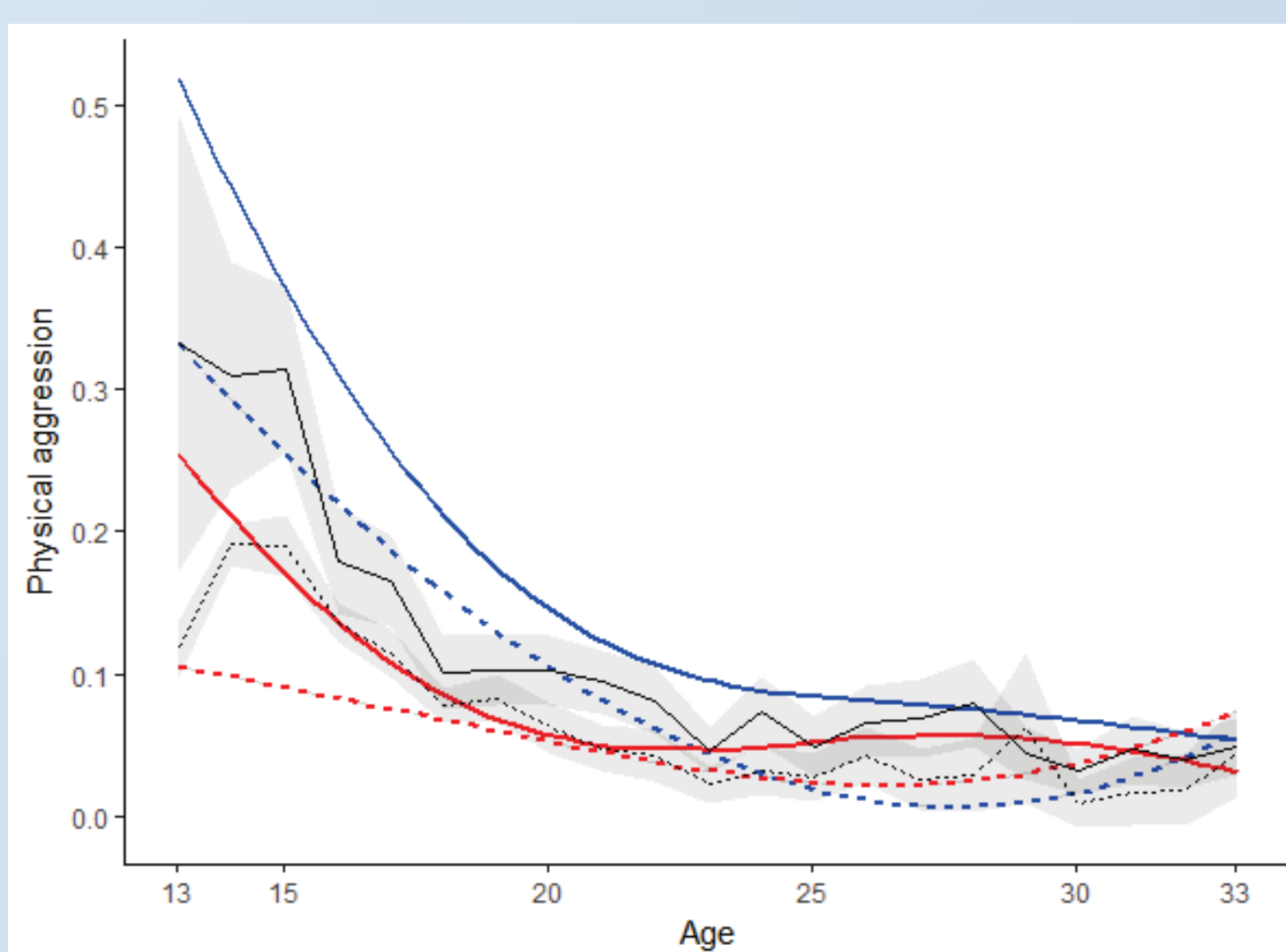
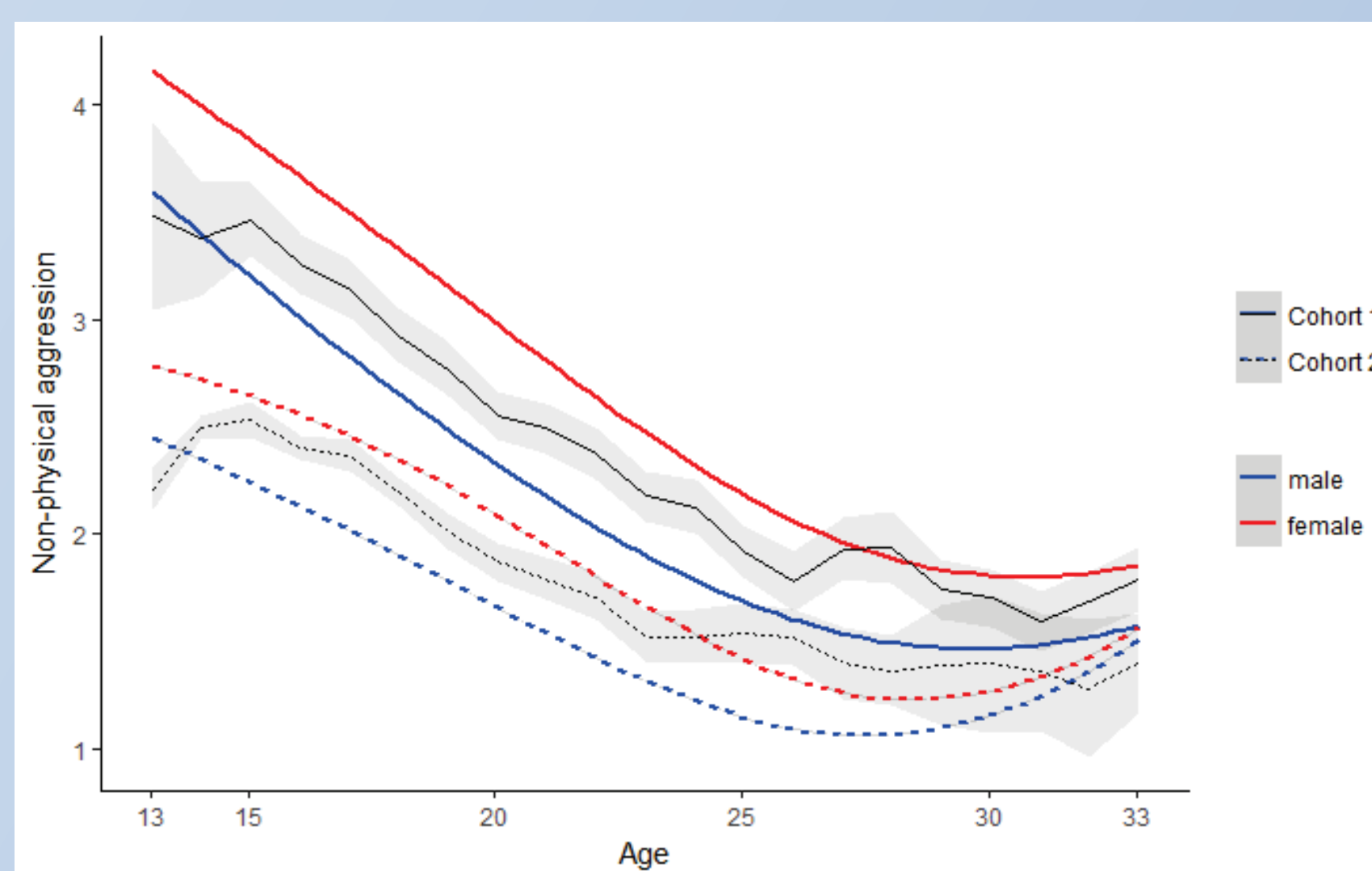


Figure 4. Cohort effects – non-physical aggression



Cohort effects suggest that both physical (Figure 3) and non-physical (Figure 4) aggressive behavior are less prevalent in Cohort 2 (\Rightarrow 1980), compared to Cohort 1 ($<$ 1980). Similar gender differences were found as in Study I. Cohort effects seem relatively stable across age.

Conclusion

Results show a decline in both physical and non-physical aggressive behavior between 1991 and 2014. This decline is relatively stable across gender and age. Multiple factors could explain this decline, for example changes in demographics, culture, and technology. Future studies are needed to investigate these causes.

Future project

Time, age, and gender explained approximately 5 percent of the variance in physical and approximately 13 percent of variance in non-physical aggressive behavior. In our next project, we will investigate the relative importance of genetic and environmental factors in explaining variance in both types of aggressive behavior, and also in explaining variance in rule breaking behavior, by conducting a twin study.