**Appendix C.**

**Age-specific description of quadratic cohort effects**

For both sexes, we did not find across age variation (i.e., cohort by age interactions) in quadratic cohort effects for either binge drinking frequency or prevalence. However, as presented in the “Cohort main effects (all ages combined)” portion of the results, section, we did find sex differences in quadratic cohort effects (i.e., sex by cohort interactions) for both binge drinking frequency and prevalence. For men, quadratic cohort main effects for both frequency and prevalence were non-significant. Consequently, for men across-cohort variation (i.e., historical variation) in binge drinking was steady (completely linear) across cohort and this pattern held equally across age. Thus, as illustrated in Figure 2, for men the pace of decrease at age 18 as well as the pace of increase at age 30 was generally steady across the distant, middle, and recent cohort groups. However, quadratic cohort main effects for both frequency and prevalence were positive for women. Consequently, for women, across-cohort variation (i.e. historical variation) accelerated upward across cohort, *and the extent to which this was the case did not vary by age* due to the fact that the positive quadratic effect for women did not vary by age. Thus, as illustrated in Figure 2, for women the pace of decrease at age 18 slowed (i.e., accelerated upward) across the three cohort groups (i.e., age 18 binge drinking decreased between distant and middle cohort groups and then remained steady between middle and recent cohort groups), while the pace of increase at age 30 quickened (i.e., accelerated upward) across the three cohort groups (i.e., age 30 remained steady between the distant and middle cohort groups but then increased between the middle and recent cohort groups).

Because for both binge drinking frequency and prevalence the quadratic cohort effect did not vary across age for either sex and the across-age average quadratic cohort main effect was positive for women and non-significant for men, sex convergence was more pronounced among more recent cohorts *but equally so across the age 18-30 age band*. For example, at age 18 the pace of sex convergence quickened across cohort because the pace of decrease across cohort slowed for women (due to the positive quadratic cohort main effect that applied equally across age) yet remained steady for men (due to the non-significant quadratic cohort main effect that applied equally across age). Likewise, at age 30 the pace of sex convergence quickened across cohort because the pace of increase across cohort accelerated for women (due to the positive quadratic cohort main effect that applied equally across age) yet remained steady for men (due to the non-significant quadratic cohort main effect that applied equally across age).

*Effects of potential chronosystem mediators.* For both sexes and for both frequency and prevalence, quadratic direct effects did not vary by age, which was also the case for total quadratic effects (see Table 2), and were only slightly reduced from the total quadratic effects listed in Table 2. For women only, combined indirect quadratic effects for binge frequency and risk were positive (although modest in size) and did not vary by age, indicating combined indirect effects were larger among more recent female cohorts, but equally so across age. For both frequency and prevalence, sex differences in combined indirect quadratic effects did not vary by age and across-age averages proved non-significant. For males, we found no specific indirect quadratic effects (See Supplemental Tables 1-4). For females, specific indirect quadratic effects (See Supplemental Tables 1-4) were modest, but positive when significant, and typically did not vary by age, indicating that the size of specific indirect effects were larger among more recent cohorts regardless of age. We did not find any sex differences in specific indirect quadratic effects, aside from MLDA for binge drinking frequency (as we discuss in the text of the main document).