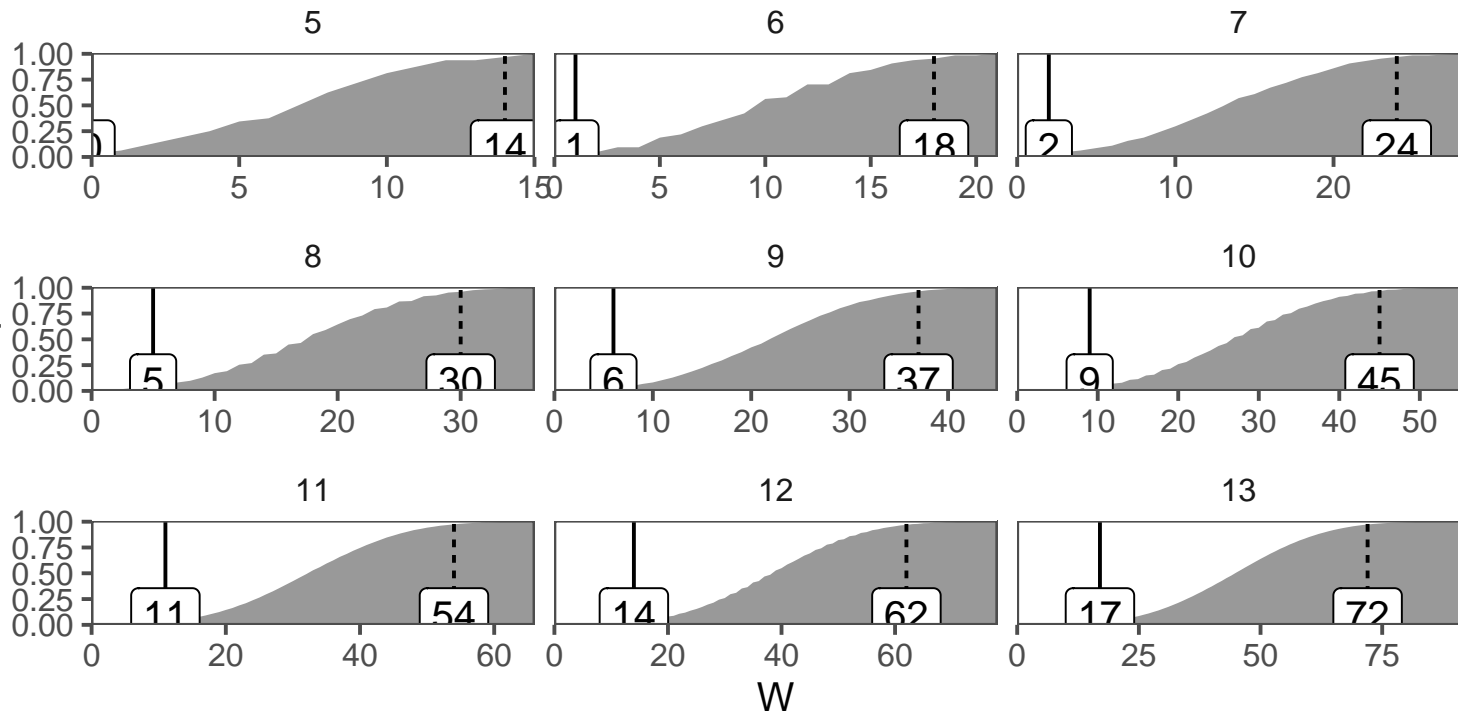exact cumulative