



Gender, age, and competition: A disappearing gap?

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ABSTRACT

Research on competitiveness at the individual level has emphasized sex as a physiological determinant, focusing on the gap in preference for competitive environments between men and women. This study presents evidence that women's preferences over competition change with age such that the gender gap, while large for young adults, disappears in older populations due to the fact that older women are much more competitive. Our finding that tastes for competition appear just as strong among older women as they are among men suggests a simple gender-based view of competitiveness is misleading; age seems just as important as sex.

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1. Introduction

The gender gap in willingness to enter competitive environments has captured a great deal of attention from economists. A burgeoning literature documents the male–female gap across a wide range of settings, explores its policy implications, and examines its role in the differential success of men and women in labor markets (Gneezy et al., 2003; Gneezy and Rustichini, 2004; Niederle and Vesterlund, 2007; Booth and Nolen, 2012; Balafoutas et al., 2012; Almás et al., 2015; Niederle et al., 2013; Buser et al., 2014; Flory et al., 2015). The existence of aversion to competition can be very costly – for firms as well as for individuals. For firms, the use of relative performance based incentives and promotions may lead to loss of talent if highly skilled workers self-select out of competitive environments. For individuals, the widespread use of competition-based allocation mechanisms means avoiding competition can entail large costs: whether for a high-paying job, a position of authority, or rights to scarce resources, to opt out of competition often means foregoing large potential gains. A full understanding of the determinants of attitudes toward competition is thus critical for understanding the costs of competition aversion and the design of mechanisms to mitigate undesired effects of differences in competitiveness.

Experiments have consistently found that women are generally less willing than men to compete, even when it is in their material interest to do so (see Niederle and Vesterlund (2011) for a review). However, there is surprisingly little age

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diversity in existing evidence on this question when it comes to adults.¹ The findings come largely from young populations (e.g. university and primary or secondary school students), with little attention given to what happens to competitiveness as adults grow older. Our findings show this omission is not trivial: while we replicate the standard result among young populations that women are significantly less competitive than men, we find the gender gap disappears among more mature adults. Focusing on *competition preference*—a measure of competitiveness that controls for skill, risk appetites and other factors—we find that the age gap between mature women and young women is just as large as the gender gap between young women and young men. Furthermore, more mature women are just as competitive as all men. For men on the other hand, we find no evidence that age affects preferences over competition.

One important exception to the general focus on young populations in competition experiments is [Mayr et al. \(2012\)](#), who find changes in competition entry by age among adults aged 25–74, and a large gender gap in selecting into their competitive task that persists across all ages. In contrast, [Charness and Villeval \(2009\)](#) find competitiveness does not change with age, and finds no signs of an overall gender gap among individuals in their late teens to early seventies when controlling for risk tastes. Similarly, in one other study that includes adults of a broad age range, [Buser et al. \(2015\)](#) find the overall gender gap across all ages is considerably smaller than in most studies, disappears when controlling for risk, and does not exist among older individuals. Neither of the latter studies look at the effect of age separately for each gender.

In this paper we examine competitiveness among men and women from age 18 to 90 and find significant changes in competition preferences for women across age but no corresponding changes for men. These findings complement [Mayr et al. \(2012\)](#) by examining choices under a different structure of competition and by focusing more precisely on changes in competition preferences (independent from risk appetite and other factors) as they impact tournament entry. Moreover, we show that some of the age patterns they find may be driven in part by changes in tastes for competition per se. Unlike [Charness and Villeval \(2009\)](#) and [Buser et al. \(2015\)](#) we examine the interaction of age and gender, to find that women 50 and older are much more competitive than women under 50 and at least as competitive as men of all ages.

To test for the effects of age, we use data from laboratory experiments on competition with men and women of all adult ages. Our main sample draws from villages in rural communities of Malawi, a country in sub-Saharan Africa. To help verify the pattern we discover is not particular to our initial setting, we draw an auxiliary sample from an urban US population. While the smaller size of this second sample makes its results somewhat more speculative, the sharp similarity in the effects of age on competition preference within each gender across the two different societies is provocative. We focus on age 50 for much of the analysis (though we also test for more gradual age effects as well). For women, changes at this age would be predicted by recent work on sharp changes in competitiveness at puberty, the role of hormones in tastes for competition, and evolutionary psychology models. (We discuss this further in [Section 5](#).) Theory suggests, and our data support, a strong relationship linking sex, age, and competitiveness.

In addition to our experimental results, we also replicate with our data the main findings on gender and competition preferences that helped launch this literature ([Niederle and Vesterlund, 2007](#)), when restricting to subjects of a similar age range. Age is a factor that is often overlooked in experimental studies. However, doing so may prevent a full understanding of the behaviors we wish to understand. While not the only area of importance, labor markets and the workplace have been focal points for the implications of differences in competition preference. Adults actively participate in the labor force throughout the middle and upper age ranges – even more so as the age of retirement rises – and prior work has highlighted the need to better understand how older workers respond to competition. This study helps address that gap. Our findings also have significance for the design of incentives, for empirical researchers and policymakers, and for the rapidly growing body of research on competitiveness.

2. Experimental design

To test the hypothesis that the gender gap in willingness to compete is a function of age, we use data from an experiment initially designed to examine gender differences in competitiveness among adults of a broad age range in rural Malawi. Upon discovery of a striking pattern with respect to age among women, we replicated the experiment in the US in order to test whether the age pattern would hold when changing the cultural setting. In our procedure, we rely heavily on the experimental protocol designed by [Niederle and Vesterlund \(2007; henceforth NV\)](#). We augment their design by eliminating the need for literacy, broadening the age-distribution of participants, and incorporating multiple cultures within the experiment.

As NV emphasize in their seminal study, an important challenge in identifying the effects of a given determinant (e.g. gender) on appetites for competition is the confounding effects of other omitted characteristics correlated with the determinant of interest. They note that gender differences in risk appetites, aversion to receiving feedback on relative performance, and in self-confidence can all create a gender gap in willingness to compete, in addition to a gender difference in tastes for competition itself. Their protocol resolves this problem by having subjects make two choices, both of which are affected by risk preferences, feedback-aversion, and self-confidence, but only one of which is affected by a taste for competing against

¹ Many studies examine competitiveness among children (e.g. [Cardenas et al., 2012](#); [Dreber et al., 2011](#); [Dreber et al., 2014](#); [Andersen et al., 2013](#); [Sutter and Rützler, 2010](#)), often identifying the absence of a gender gap among pre-adolescents and an 'age of onset' of gender differences. However, almost no studies examine the gender gap among older adults.

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