Running heading: EFFECT OF A GAP-YEAR

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I Wish I Had (Not) Taken a Gap-Year?
The Psychological and Attainment Outcomes of Different Post-School Pathways.

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Abstract

Existing gap-year research indicates a number of benefits of a gap-year at the end of school and before university enrollment. Lifespan theory of control, however, suggests that direct goal investment, rather than delay, at developmental transitions is associated with more adaptive outcomes. Comparing these perspectives, we undertake two studies: one in Finland (N = 384, waves = 3) and one in Australia (N = 2259, waves = 5) both with an initial time wave in the last year of high-school. We explore the effects of a gap-year on both psychological and attainment outcomes using an extensive propensity score matching technique. The Finnish study found no difference in growth in goal commitment, effort, expectations of attainment and strain, or in actual university enrollment in those planning to enter university directly versus those who plan to take a gap-year after matching. The Australian study found no difference in growth in outlooks for the future and career prospects, and life satisfaction between gap-year youth and direct university entrants. However, the study did find that gap-year students were more likely to drop out of a university degree. Implication for theory and practice are discussed.

Supplementary material: https://pdparker.github.io/gapyear

Keywords: Gap-year, goals, attainment, propensity score matching.

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The transition from high-school is a major developmental milestone and is associated with the requirement to address a number of major developmental tasks (Dietrich, Parker, & Salmela-Aro, 2012; King, 2011, 2013; Nurmi, 2001; Oswald & Clark, 2003; Parker, Lüdtke, Trautwein, & Roberts, 2011; Zarrett & Eccles, 2006). One of the more important of these is that this transition represents an age-graded developmental task in which young people are expected to begin to implement long-term educational and career goals (Dietrich et al., 2012; Erikson, 1968; Zarrett & Eccles, 2006). Furthermore, the transition represents an important opportunity to enact career goals, self-beliefs, and identities developed during schooling (Savikas, 2005). This is possible via pathways such as entering the labor market, undertaking tertiary vocational education or traineeships, or by enrolling in university in anticipation of fulfilling entry requirements into high prestige occupations. In this research we focus on the university pathway. We do this because there is an increasing requirement to have a tertiary level of education in order to succeed in the labour market, and to protect oneself from economic hardship (Checchi, 2006; Côté, 2006; OECD, 2010).

Traditionally, university entry proceeded directly after high-school, however, this pathway has become increasingly diversified, as there are a growing number of individuals who do not enter university directly after schooling and instead take a gap-year period (Carford & Cribb, 2013). Proponents of a gap-year suggest a range of benefits (see however Crawford & Cribb, 2012). However, alternative theoretical perspectives and research exist that suggest more negative outcomes. In particular phase adequate engagement (Dietrich et al., 2012) and lifespan theory of control (Heckhausen, Wrosch, & Schulz, 2010) indicate that direct investment in goals at periods of transition (i.e., direct university entry) is crucial for successful pathways to adulthood (Haase, Heckhausen, & Köller, 2008). It is the aim of the current paper to explore this juxtaposition.

The overarching counter-factual question we address to resolve this divergence of views is: “Is there evidence to suggest that those who embark on a gap-year would have

significantly different outcomes had they instead gone directly to university?". We apply this question to differences between those who took a gap-year and those that enter university directly on:

a) Growth in career and educational goal engagement to test whether gap-years are associated with increased commitment and development in educational and career goals (e.g., Coetzee & Bester, 2009; King, 2011);
b) growth in satisfaction with life, prospects for the future, and satisfaction with career prospects in particular to test whether gap-years are associated with greater confidence (e.g., King 2011, 2013);
c) differences in university degree enrollment, dropout, completion, and further studies to test whether gap-years are associated with better achievement and attainment at university (e.g., Rose Birch & Miller, 2007).

We investigate these questions in two large longitudinal samples from Australia and Finland. Overcoming deficits in previous research we use an extensive matching procedure on pre-transition variables to limit the influence of third variable explanations (see Crawford & Cribb, 2012). In addition, we follow participants from the end of high-school in an attempt to capture those that take up a university degree and those that do not. Finally, we cover an extensive time period in order to fully cover attainment including enrollment, drop-out, degree completion, and further studies (e.g., advanced or post-graduate degrees).

Gap-years

The gap-year phenomenon is, in many respects, a modern incarnation of Erikson's (1968) concept of *institutional moratorium*. This period occurs during the transition to adulthood where it is characterized by a socially approved interruption in the transition to adulthood allowing young people to explore potential adult roles, gain confidence, and to formulate and commit to career and educational goals (King, 2011, 2013). Uptake of a gap-year in the UK appears to have increased in the last 20-30 years though it has leveled off in the last decade (Crawford & Cribb, 2012). The incidence of taking a gap-year is increasingly

popular in Australia. In 1995 around seven percent of high-school graduates took a gap-year, 12% in 1998, 20% in 2003, and up to 22% of the students in 2006 (Curtis, 2014; Curtis, Mlotkowski, & Lumsden, 2012; Lumsden & Stanwick, 2012). In the US there is a renewed interest with several prestigious US universities providing financial assistance for students to encourage them to take a gap-year (Sutherland, 2014).

Research specifically on gap-years suggests many benefits (though see Crawford & Cribb, 2012). Benefits include cultural, personal development, and educational, occupational, and status attainment (Coetzee & Bester, 2009; Heath, 2007; Jones, 2004; King, 2011; Martin, 2010). Here we focus on three major purported benefits in terms of long-term educational, occupational, and status attainment. First, the period is reported by a number of researchers as being critical to formalizing commitments to career and educational goals, gaining confidence in future prospects and later employability (Coetzee & Bester, 2009; Health, 2007; King, 2011). For example, Coetzee and Bester (2009) frame their findings in relation to Super (1957) and Savikas (2002), reporting that "the supreme benefit of the gap-year is in terms of career development." (p.261).

Second, qualitative interviews with gap-year youth report that participants felt the period increased their confidence in many ways including their confidence in their future prospects particularly in relation to obtaining employment (Coetzee & Bester, 2009; King, 2011). Indeed, not just qualitative interviews suggest this. The academic literature suggests that gap-years provide a critical opportunity for young people to develop skills and confidence, making them more competitive in educational and career markets (Heath, 2007). However, King (2011), suggests that this may be changing with young people suggesting that the increase in employment prospects as a result of a gap-year had declined due to employers placing less value on pre-university experiences.

Third, Rose Birch and Miller (2007), found that those who took a moratorium period

before entering university had higher levels of achievement than those who did not, and that these benefits were particularly apparent for male students of average ability. Likewise, Martin (2010), in one of the few studies to control for pre-existing differences, found a number of motivational benefits for gap-year youth that are linked to achievement. It was found that the period was particularly beneficial for individuals with problematic achievement and motivation profiles to start out with.

Research on gap-years does not typically frame their research in terms of emerging adulthood (e.g., Arnett, 2000, 2006). However, the benefits of the period are often framed in the context of the period providing a zone of relative safety from which young people can explore identity and roles, and undertake the task of resolving goal uncertainty and formalization of a goal (Coetzee & Bester, 2009). This would appear to be consistent with the emergence of a relatively modern developmental stage referred to as emerging adulthood which suggests that young people in their 20s are now characterized by considerable instability and role and identity exploration. Research suggests that the emergence of this period is, on average, not clearly detrimental, nor beneficial, to either individuals or society (Arnett, 2000). Indeed, the transition from high-school itself is associated with an increase in relationship quality and well-being (Litalien et al., 2013; Parker et al., 2012).

While increasing in popularity, it is clear that even in the context of the emerging adulthood, most university track young people go directly to university. That is even when young people are, on average, delaying marriage and parenthood (Arnett, 2000), the dominant pathway to tertiary education is still direct entry. This has potential implications for those who choose to take a gap-year. In particular, research and theory suggests that the transition from high-school still comes with a number of societal expectations surrounding engagement in social roles that are enforced via reward and punishment (Parker et al., 2012). This enforcement can be passive, meaning that opportunities tend to be accumulated around the point of transition (Heckhausen & Tomasik, 2002). The effect of this is spelt out in the lifespan theory of control.

Lifespan Theory of Control

While the majority of research on gap-years has suggested positive implications of this period, research on other post high-school pathways have suggested transition delays are actually associated with negative outcomes. For example, empirical research by Haase et al. (2008) suggests that delayed engagement is associated with poorer attainment and lower well-being in the long term for those transitioning to vocational training. Likewise, Heckhausen and Tomasik (2002) indicate that while a number of transitions have developmental deadlines, the post-school transition for vocational track individuals is particularly narrow with opportunities rapidly diminishing such that those who fail to make the transition in a timely manner may be "doomed to unskilled work for their entire lives" (p. 201).

Such research appears to contradict much of the research on a gap-years. It is possible this contradiction is due to the vocational and tertiary educational transitions being qualitatively distinct, and thus what is beneficial for one need not be so for the other. However, these findings are derived from a universal theory of lifespan theory of control. Heckhausen and colleagues (e.g. Haase et al., 2008; Heckhausen, 2010; Heckhausen & Schulz, 1995) indicate that transitions represent developmental deadlines where goal engagement before the transition becomes paramount. From the perspective of lifespan theory of control, goal engagement allows individuals to capitalize on success or re-orientate goals in the face of failure. Delaying transitions is risky as opportunities become increasingly sparse and constraints increase. Put simply, lifespan theory of control hypothesizes opportunities as a function of age, rising sharply at the point at which biological, social and cultural systems, and institutions deem is appropriate before declining rapidly. For a gap year, opportunities may also be structural in terms of the premium employers place on post university graduation experience (King, 2011), intrapsychic in terms of partial fulfillment of career self-concept (Dietrich et al., 2012), or even biological where Steinberg (2014) has suggested brain plasticity for higher cognitive functions is

particularly important up to the age of 23-25, meaning that young people should try to maximize their exposure to higher education during this period.

Dietrich et al (2012) synthesize lifespan theory of control and other career construction and exploration theories in the context of the post high-school transition. This paper suggests the transition from high-school is an age graded task in that timing of the transition is set by cultural norms and structures (see Nurmi & Salmela-Aro, 2006). The typical development pattern then is based on initial awareness of the need to develop career and educational goals early in students' school career (Hirschi & Läge, 2007). As they transition through compulsory schooling, individuals then undertake in-breadth exploration of post-school options and then move increasingly toward in-depth exploration as the transition approaches (Kunnen & Bosma, 2000). The approaching transition is seen to trigger the development, consolidation, and then confidence building of career self-concepts, orientated toward a particular post high-school pathway. Choices made at the transition (i.e., where to go to university and what to study) represent opportunities to enact these self-concepts (Savickas, 2002, 2005, 2011; Super, 1957). This developmental pathway is re-enforced by social and educational structures such that opportunities are typically amassed directly following high-school and decline thereafter (Dietrich et al., 2012; Heckhausen & Tomasik, 2002).

Taken together, the end of high-school acts as a clear developmental deadline in which young people are expected to begin to enact the career and educational plans they have been developing in high-school (Heckhausen & Tomasik, 2002). A gap-year seeks to extend that deadline where recent theory and research suggests that on time goal investment (e.g., direct university entry) at this transition is associated with greater goal engagement and well-being (Haase et al., 2008; Nurmi & Salmela-Aro, 2002; Tomasik & Salmela-Aro, 2012). While empirical research has tended to favor gap-years, there are hints in government reports that are more in keeping with predictions made by lifespan theory of control. In particular in a report for the UK Department for Education, Crawford and Cribb (2012) use data from two

large-scale government funded longitudinal studies of youth in transition. They found a number of long-term disadvantages of a gap-year, including hourly earnings and wages, even at age 38. One potential reason the authors give is the importance of transition timing, which is consistent with lifespan theory of control. Importantly, as opposed to much gap-year research, the work of Crawford and Cribb is based on large longitudinal databases, which begin when young people were still in school and continued well into adulthood.

Current Research

Research on gap-years to date suggests a number of positive outcomes of the period of which we focus our research on:

a) Greater attainment (Rose Birch & Miller, 2007) – measured here by university commencement, drop-out, graduation, and further/advanced studies;
b) clarification and commitment to educational and career goals (Coetzee & Bester, 2009; King, 2011) – as measured here by an idiographic measure of goal engagement similar to that used by Haase et al. (2008) research on the post high-school transition covering goal commitment, expectation of success, invested effort, and strain; and
c) confidence in future prospects (King 2011, 2013) – including life satisfaction, satisfaction with future prospects, and satisfaction with career prospects specifically.

The current research focuses on the counter-factual question: “Is there evidence that gap-year youth would have different outcomes if they had chosen to enter university directly?”.

In addition to juxtaposing these perspectives we also aim to address several limitations in previous research. Firstly, there is relatively little research that uses a lifespan theory of control that specifically addresses the transition to university. Second empirical research on gap-years has often utilized retrospective designs in which participants are drawn from those who have taking a gap-year and returned to university. This is problematic for several reasons. First, as the sample consists only of those at university there is no way of

estimating how many individuals took a gap-year but never commenced a university degree (Polesel, 2009). Second, comparisons with direct entry against a more selective gap-year sample may be biased. Third, research in this area rarely matches participants on pre-transition variables, which may account for differences between those who take a gap-year and those who do not (Crawford & Cribb, 2012). Finally, there is a relative lack of research with databases that cover a sufficient timeframe to estimate attainment such as degree completion and further study (e.g., advanced and post-graduate degrees).

As such, we undertake two studies, one in Australia and one in Finland that match participants on a large range of pre-transition variables and estimate critical goal engagement, attainment, and confidence variables models across multiple time waves. While this represents an important advance it is critical to note that we focus here only on average effects of a gap-year only. As such our aim is to explore the veracity of a gap-year on average and thus the research does not suggest whether a gap-year may be particularly beneficial or negative for a given individual or group of individuals. The full analysis strategy, additional results relating to matching procedures, and the plotting of growth models can be found in the online supplementary material (https://pdparker.github.io/gapyear).

Study 1: Finland

Method

Participants. Participants were drawn from the university track cohort of the *Finnish Education (FinEdu)* study with data obtained from six schools (Tuominen-Soini et al., 2008). For the current study, we focused on three time waves: a) The *pre-transition wave* (T1), during the participants' last year in high-school (age 19); b) the *transition wave* (T2), collected two years after graduation when participants were 21 years of age; and c) the *establishment wave* (T3), collected when participants were 22-23 years of age and were expected to have entered university and be enrolled in their degree. A brief overview of the

educational context can be found at https://pdparker.github.io/finContext.html.

The total sample size was 636. Of those, 384 students planned on obtaining a university degree with the remaining planning on entering open university, a polytechnic university, or directly entering the labor force. Of the 384 participants 279 indicated that they planned to enter university as soon as possible after high-school, while 105 indicated they planned to take a gap-year. For the gap-year group 55 participants planned to undertake military service, 20 would take a year off without any firm plans, 26 planned to work, and 14 planned to spend time overseas.

Sixty-eight percent of the sample was female, approximately 30% of individuals came from families with both parents in a white-collar profession, and over half the sample had at least one parent in a white-collar profession. For the pre-transition wave, participants completed the survey instrument during a school event. To maximize response ratings, students not present during the research event were mailed the questionnaire and/or were contacted via telephone.

Measures. *Goal Engagement* was measured using a revised version of Little (1983) Personal Project Analysis inventory, and is similar to that used by Haase et al. (2008) in their study on post-school transitions. In particular, participants were asked to report a key personal goal related to educational or career attainment. Participants were then asked to appraise this goal according to four scales: goal *commitment* (two items), *expectancy* of successful attainment (two items), *strain* resulting from pursuing the goal (two items), and *effort* expended in pursuing the goal (two items). All scales were measured on a seven-point scale with poles of *very little* and *very much* (Vasalampi, Salmela-Aro, & Nurmi, 2010). Goals were largely educational at the pre-transition wave (72%) but became increasingly career orientated for the post high-school waves.

Matching variables. We used 28 pre-transition variables for matching including the individual items or goal engagement for both the participants' central educational and

occupational goal, but also as they pertained specifically to the goal of gaining a university degree (this variable was not present for all time waves and thus was not considered as an analysis variable). Other psychological variables used for matching included depression, burnout, self-esteem, satisfaction with life, and goal autonomy. Demographic variables included gender, mother and father's occupation, age, GPA in main school subjects, and whether the students had undertaken some matriculation exams before the transition from high-school. See supplementary material for more information on matching variables (https://pdparker.github.io/Finland.html).

Analysis. In the current research we were interested in a) university enrolment, b) the developmental trajectories of cognitions and behaviors relating to participants central educational or career goals, and c) whether the type of post school pathway moderated these outcomes. In order to investigate the developmental trajectories we ran a series of growth curve models. We chose to take a multilevel approach given that the study design was not balanced on time waves. For all goal variables of interest we estimated growth curves for both unadjusted and adjusted samples. The actual adjustment strategy is described in more detail in the next section. For university enrollment status we conducted χ^2 tests at T2 and T3 with *p*-values taken from Monte Carlo tests with 2000 replications (Hope, 1968). Individual cells were assessed for significance by considering standardized residuals > 1.96. All analyses were conducted in *R* version 3.0.2 (R Development Core Team, 2013).

Propensity score matching. As noted in the literature review, much of the previous research did not control for pre-existing differences between those who did and did not take a gap-year which could have biased results. To control for confounding variables we used propensity score matching to partial out the effect of these variables on the relationship between the grouping variable (gap-year versus direct entry groups) and the outcome (e.g., goal commitment). This approach allows for answering counter-factual questions like those proposed here (see Morgan & Winship, 2007). Where randomized control trials are neither

feasible nor ethical, such as in the present case, propensity score matching aims to produce balance across a wide range of covariates in order to facilitate the estimation of treatment effects within a quasi-experimental setting (Morgan & Winship, 2007). To do this, the propensity score matching models the relationship between the covariates and the grouping variable. We used logistic regression to estimate the propensity score and based on these scores we used nearest neighbor matching where matches were allowed when participants were within .20 of the standard deviation of the logit of the propensity score. In our particular sample, many more students were in the university group than the gap-year group. In order to retain as many participants as possible, we matched up to three students in the university condition to a single comparable student in the gap-year condition. Matching was done without replacement. The 3:1 matching resulted in a set of weights that were used in later hypothesis testing so that the effective sample size in both groups was the same (see Stuart, 2010; Thoemmes & Kim, 2011, for a review of propensity score matching procedures). Propensity score estimation and matching were done with the *MatchIt* package (Ho, Imai, King, & Stuart, 2011). Growth curve models were estimated using the *lme4* package (Bates, Maechler, Bolker & Walker, 2014).

Missing data. Missing data was also a complication as it was likely to be, at least in part, a function of participants' responses on other variables measured in the data (i.e., missing at random [MAR]). Missing data was mostly under one percent for T1 variables but increase to around 40% (due to attrition) by T3 (see supplementary material). Traditional methods such as listwise deletion could have biased the results by not accounting for missingness being dependent on variables in the analysis. Given the near complete data at T1 we had a good basis on which to impute missing data under MAR assumptions. To do this we used *Amelia II* (Honaker, King, & Blackwell, 2010) resulting in five imputed data sets (see Enders, 2010; Rubin, 1987 for a review). The use of multiple imputations (hereafter MI) in propensity score estimation is a relatively under-developed area of research, however, the MI method provides a powerful and flexible approach to dealing with missing data

(Stuart, 2010). In this case we conducted propensity score estimation, matching, and estimation of the effect of moratorium on the outcome variables separately for each imputed dataset before combining the results using the *mitools* package (Lumley, 2012) and custom-made functions for comparing nested growth models with log likelihood ratio tests (functions were based on the formulas by Asparouhov & Muthén, 2010 and are available from the lead author on request).

Results

Pre-matching. We begin our analysis by exploring how goal engagement changes as young people move out of high-school. The objective was to consider how these factors changed over time and to what extent the participants' transition pathway moderated these changes. A linear growth model provided a sufficient fit for all goal variables based on pooled sample adjusted log likelihood ratio tests comparing no growth, linear, and quadratic growth models (see Table 1). Because of convergence issues only the intercept and linear slope were random in these models. These models with a random quadratic slope, while not meeting convergence criteria, gave very similar results to those above. As can be seen from Table 2, results suggested that the transition from high-school was generally positive for goal engagement with goal effort and expectations of attainment displaying significant increases from T1 to T3. There was, however, a significant accompanying increase in goal strain. Growth figures can be found at https://pdparker.github.io/finGrowth.

There was evidence of significant moderation by anticipated transition pathways for both goal commitment and effort. The results suggested that the direct university entrants had significantly higher initial levels of commitment and invested more effort in their major educational or career goal. However, the gap-year group had significantly steeper slopes. Put simply, those who anticipated taking a gap-year were less committed to their goals and were applying less effort toward attaining them at the end of high-school but grew more rapidly in these variables than direct university entrants such that

they had similar levels by T3. There were no significant difference in reported goal strain and expectancy of goal attainment. We next reanalyzed these models following propensity score matching.

Propensity Score Estimation and Matching. The next step in the analysis was to match participants from the gap-year and university groups on an extensive set of available covariates. In total we assessed balance across 405 terms including variable interactions and quadratic effects. Illustrating the need for this approach, there was considerable evidence of a lack of balance between groups with over half of the terms assessed displaying Cohen's *d* differences between groups of over half of a standard deviation.

The matching procedure resulted in all of the terms assessed for balance having Cohen's *d* differences of less than .20 (averaged across the five imputations; see supplementary material). However this came at the cost of a smaller matched sample with the total sample size reduced from 386 to 224 (University: $n = 142$, Gap-year: $n = 82$). Applying weights yielded an effective total sample size of 164. Most of the unmatched participants had propensity scores that were outside the region of common support (i.e., regions in which the distribution of the propensity score for the two groups did not overlap).

Adjusted Results. This new matched sample was used to re-estimate the latent growth models. All models were estimated with a weighting variable to account for 3:1 ratio matching used in the propensity score matching procedure. The difference to the previously reported unadjusted models is that many potentially confounding variables were used in the matching procedure and therefore could not provide alternative explanations for our observed results. The results from the adjusted model thus provide evidence of the effect of taking a gap-year or continuing directly into university for groups of relatively similar individuals. These results answer the critical counter-factual question posed at the beginning of this article.

Table 2 illustrates the difference in estimates for the matched and unmatched samples. Similar to the unmatched models, expectations of goal attainment, goal effort, and goal strain

increased significantly over time. Goal commitment also increased, but not significantly. There was, however, no evidence of moderation by transition pathway for either initial levels or trajectories. No difference in initial levels is unsurprising given participants were matched on T1 goal engagement. The lack of significant differences for trajectories, however, suggests that a gap-year has no significant influence on the development of goal engagement.

University enrollment status. We also considered the effect of university enrollment status at T2 and T3. At T2 university enrollment status was relatively low for both groups. This is most likely due to the competitive university entry system in Finland, which can take several years to negotiate. However, there were significant differences between groups ($p < .001$) with university enrollment significantly higher in the direct enrollment group (30%), compared to the gap-year group (2%). At T3, however, the gap narrowed considerably (gap-year: 74%; direct entry: 84%) and was not significant ($p = .346$). In the matched sample the results were similar at T2 (gap-year: 2%; direct entry: 26%) and were even closer at T3 (gap-year: 77%; direct entry: 74%; $p = .476$).

Taken together, the results from Study 1 suggest that there is little evidence that individuals who took a gap-year would, on average, have had significantly different outcomes had they attempted to enter university directly after high-school.

Study 2: Australia

Method

Participants. Participants were taken from the 2003 cohort of the Longitudinal Study of Australian Youth (LSAY). The LSAY database takes as its initial time wave all Australian participants from the Program of International Student Assessment (PISA; OECD, 2004). This sample of 10,370 15 years olds is broadly representative of the Australian population of interest. The participants were then followed on a yearly basis into adulthood. Unlike the Finnish database, LSAY's population of interest was a particular age group rather than a particular school grade cohort. However, the majority

of students (71%) was in year 10 at the initial time wave of interest and thus formed the sample pool for this study. From this sample 2228 participants met the criteria for inclusion in the sample (i.e., after completing year 12, applied for, and were accepted to attend university). The direct entry group (n = 1723) consists of all those who indicated they directly took up a university placement offer after high-school (i.e., indicated they had commenced a university in the first time-wave post high-school). The gap-year group (n = 505) consisted of those who accepted a university place but deferred enrollment; generally for a year.

In relation to the attainment items (university entry, degree completion, drop-out/withdrawal), gap-year youth were by definition a year behind their direct-entry counterparts. We thus aligned attainment items to account for this. For example, degree completion for the direct entry group at T was compared to these potential outcomes in the gap-year group at T_{N+1}. Comparing matching time waves for direct entry and gap-year youth gave an unrealistically negative perspective of the effect of a gap-year; particularly for degree completion. A brief overview of the educational context can be found https://pdparker.github.io/ausContext.html.

Measures. The focus of this research was on the single item satisfaction measures of *How satisfied are you with your life in general* (life satisfaction), *How satisfied are you with your career prospect* (career prospects), and *How satisfied are you with your future prospects* (future prospects). These items have been used in every cohorts of the LSAY database since 1995 and are based on the work by Cummings and colleagues (e.g., Cummins et al., 2003) on the Australian unity wellbeing index, used extensively in international research, and are similar to the adaptations used in other large panel studies in Australia including HILDA and the National Health Survey (Hillman & McMillan, 2005).

In addition, university enrolment, degree drop-out/withdrawal, and degree completion were measured for each wave of the study. This information came from the

derived variable supplement to the 2003 LSAY data and represents the integration of information from a number of sources including responses to a large educational history survey with checks against previous time waves. The formation of this variable and the SAS syntax used to create it can be found at http://www.lsay.edu.au/publications/2487.html.

The analysis of interest included the last year of high-school and the subsequent four years post high-school (most bachelors degrees in Australia are three years full-time). Matching variables were largely taken from the PISA wave of the LSAY database when participants were 15 years of age. We also used the satisfaction items from ages 16 and 17 (participants' final years of high-school). In total we matched on 46 individual level variables including a) all pre-transition analysis variables in year grades 10, 11, and 12 (e.g., life satisfaction); b) attitudes toward further education and adult careers, school belonging, disciplinary and learning climate; c) achievement in math, English, science, and problem solving; d) educational aspirations of the participants, their parents, and their friends; e) math self-concept, self-efficacy, motivation, and anxiety; and f) social comparison in English math and academics in general. Demographic variables included the PISA derived index of economic, social and cultural status (OECD, 2002), gender, and indigenous status. School average achievement in English, math, science, and problem solving, and school average socio-economic status were also included. The full listing of the matching variables can be found in the online supplementary material.

Analysis. We used the same process or analysis as Study 1. Again five imputed datasets were used though missing data was small at T1, with less than one-percent missing data but increased due to attrition to approximately 20% four years after high-school.

Results

Unadjusted Results. Given we had data for five time waves, we tested growth across linear, quadratic, cubic, and quartic growth components (see Table 3). For a life

satisfaction and satisfaction with career prospects a quadratic model fitted the data best and suggested a small rise up to approximately one year after high-school for life satisfaction and two years after high-school for career prospects satisfaction before declining. This was approximated by taking the turning point of the growth curve:

$$\frac{-\beta_{lin}}{2\beta_{quad}}$$

Log likelihood ratio tests suggested a quartic model fitted the data best for satisfaction with future prospects, however the overall trend was quite similar with an increase until two and a half years after high-school before a decline. The only difference was some evidence that this declining trend may have leveled off or reversed by the end of the study (likewise approximated from first order derivatives of the growth model function). No evidence of significant differences in trajectory across the gap-year and direct university entry groups was found in any of the growth models. Figures can be found at https://pdparker.github.io/ausGrowth.html.

Propensity score matching and adjusted results. We matched the direct university entry group and deferment group on 46 variables of interest all taken when participants were 15-17 years old (up to and including the final year of high-school). Matching was assessed on all variables, their two-way interactions, and where appropriate, quadratic terms (3485 terms in total). Pre-matching there were 176 terms with a Cohen's *d* difference between groups of greater than .50 and over 300 terms with a Cohen's *d* of over .25. Post-matching all terms had Cohen's *d* differences between groups of less than .20. This resulted in a sample of 1184 direct university entrants and 482 participants who had deferred university entry for at least a year. With the application of weights this resulted in a balanced sample with an effective sample size of 964.

Results of the growth curve models with the matched samples were very similar in nature to the growth trajectory and in the absence of moderation effects of a gap-year (see

Table 4). The only exception to this was for satisfaction with future prospects in which log likelihood ratio tests suggested an intercept only (or no growth) model provided a sufficient fit to the data. Again, there was no evidence that this model was significantly different across group.

Attainment. We also explored university attainment for both groups in relation to bachelor degree commencement, completion, further study (e.g., advanced or postgraduate), dropout, and never commenced. Chi-square tests suggested significant differences between groups four years after high-school for direct entrants versus five years of gap-year youth ($p < .001$; see online supplementary material for other comparisons). There was no significant difference in a degree or in degree completion (including graduation and further study). There was a significant difference in dropouts, however, with eight percent of gap-year youth dropping out of their degree compared to only three percent for the direct university entrants. There was also a significant difference in current enrolment with a significantly greater number of direct entrants currently enrolled in university compared to those who took a gap-year. After matching significant differences were still observed ($p < .001$), with seven percent reporting they dropped out of their degree in the gap-year group compared to three percent in the direct university entrants. Likewise, there were 13% more participants in the direct entry group that were currently enrolled in a degree compared to the gap-year group. Again, there was no difference in either of the group's degree completion (including completion and enrollment in further university study).

Ten percent in the direct entry and 19% participants in the gap-year group reported having never commenced university for both pre- and post-matching samples four years post high-school. This is problematic given that the direct university entrant group was selected based on their report of commencing university in the year directly after high-school. It is possible that those who indicated they were currently undertaking a degree in the first year after high-school either were accepted to commence but never did (e.g.,

difficulties organizing accommodation or leaving before session started due to home sickness). Likewise, they may have undertaken only a short amount of study before dropping out and thus in later waves deemed this not to be sufficient to report they had once commenced a university degree. It is not possible to tell if this can account for the finding but if we assume these explanations to be the case and thus combine withdrawn/dropped and never commenced categories, those in the gap-year group were considerably more highly represented than those in the matched direct university entrants.

Results for Study 2 suggest that there is little evidence that individuals who took a gap-year would, on average, have significantly different satisfaction with life, career prospects, or future prospects had they entered university directly after high-school. Furthermore, while there were concerns over the self-report nature of university attainment, results here suggest that those who took a gap-year may have been less likely to drop-out of university and more likely to be enrolled in university had they instead entered university directly.

Discussion

The aim of this study was to assess the counter-factual question of whether youth who take a gap-year after high-school would have had significantly different outcomes if they had entered university directly instead. This counterfactual question was assessed using extensive propensity score matching and focused on whether a gap-year increased:

a) Attainment as measured here by university commencement, drop-out, graduation, and further studies (e.g., advanced/postgraduate study);
b) goal engagement as measured here by an idiographic measure of goal commitment, expectation of success, invested effort, and strain; and
c) confidence in future prospects including life satisfaction, satisfaction with future prospects, and satisfaction with career prospects specifically.

In doing so we aimed to help resolve conflicting views in the literature. From the perspective of most gap-year research the period is positive (though see Crawford &

Cribb, 2012). A lifespan theory of control perspective suggests direct goal engagement at the high-school transition is considered to be the best pathway to success for young people.

Using two large longitudinal databases of young people followed from at least the last year of high-school provided mixed results. Results indicated that for similar youth there was no difference in goal engagement, satisfaction with life, satisfaction with career, or future prospects between gap-year and direct entry groups of adolescents. This is clearly not supportive of either framework. Indeed, gap-year research in general tends to clearly point to the period being beneficial, while previous research on lifespan theory of control tends to suggest that a gap-year is negative. Of particular interest, Haase et al. (2008) point to deferment of goal engagement as being associated with poorer well-being and yet there was no significant difference in this research on life satisfaction; a common measure of well-being (Fujita & Diener, 2005).

What is of particular interest here is that the type (goal engagement vs satisfaction) and quality (multi-item idiographic vs single item) of measures used in the Finnish and Australian studies differed quite substantially and yet the research results were clearly consistent across samples. In a study on university entry in England and Germany, Parker, Schoon, Tsai, Nagi, and Trautwein (2012) suggested that similarity in outcomes from different contexts and research designs lend support toward generalizable processes. Here we likewise suggest that the similarity in results across Finland and Australia and across measures and different educational systems support the notion that a gap-year provides little discernable benefit or disadvantage, on average, in relation to goal engagement or confidence.

In relation to attainment the results were more definitive. While no significant difference in attainment were observed in Finland, results from Australia suggest that students on a gap-year were more likely to have dropped out of university, less likely to be enrolled in university four years after university, and almost 20 percent of this group

reported never having commenced a degree despite being offered a place. Importantly, these results are consistent with research on other large longitudinal databases that have cast doubts on the purported attainment benefits of a gap-year (Crawford & Cobb, 2013; Holmlund, Liu, & Skands, 2008).

Goal Engagement and a Gap-year

Overall goal engagement, satisfaction with life, career prospects, and future prospects increased after the transition from high-school. Thus while the post high-school transition period is one of immense flux, the results are consistent with findings that, in general, most university bound youth handle the transition well and that the transition is positive for a range of psychosocial outcomes (e.g., Litalien, et al., 2013; Parker et al., 2011).

In the Finnish sample, the general increase in goal effort and expectancy of attainment indicates that the post high-school transition may not be dominated by uncertainty but increasing goal engagement; at least for university bound youth in this sample. In the Australian sample the initial optimism about life and the future during the transition from high-school tended to be reversed to, or below, their initial levels at the end of high-school. This may indicate a reality shock from when individuals are faced with an increasingly uncertain job market when they move toward the end of their university (Haase et al., 2008). However such results are also consistent with the set-point theory of life satisfaction (Fujita & Diener, 2005). This theory suggests that life events can result in fluctuations in life satisfaction, and that individuals tend to return to a set-point of life satisfaction. The current research may suggest that a) set-point theory applies not just to general life satisfaction but domain specific satisfaction measures (e.g., the satisfaction with career and future prospects used here); and b) developmental transitions may act as age-graded triggers for movement from set-points. However, neither of these explanations were a focus of this study, thus more research in this area is needed.

Effect of Transition Pathway for Matched and Unmatched Samples

The juxtaposition between the matched and unmatched samples, particularly in the

Finnish sample, illustrates the potential dangers that are present in considering the effect of a gap-year without controlling for the extensive pre-existing differences. Apart from research by Crawford and Cribb (2013) and Martin (2010) this is relatively rare in gap-year literature. Such literature suggests there are many benefits of the gap-year. At least in the small range of variables measured here, however, this benefit was not apparent and in the Australian sample taking a gap-year was associated with greater drop-out and lower enrollment. This suggests the need for strong quasi-experimental designs, like the present, that can control for pre-existing differences that may account for some of the findings in the literature to date.

There are, however, several important caveats to these findings. Firstly, the propensity score matching approach provides a powerful means of assessing counter-factual research questions such as the present, where randomized assignment to transition pathways is not possible nor ethical. However, such methods only provide evidence of average effects of transition pathway and do not provide evidence of individual treatment effects (see Morgan & Winship, 2007 for a review). That is to say, these results cannot indicate whether a gap-year might have been particularly beneficial or negative within certain sub-samples. Likewise, we treat the gap-year here as undifferentiated. As such it is possible that particular types of experiences may have been particularly beneficial or negative. Nor do these results suggest that a gap-year program could not be developed that would be generally beneficial for all or at least most students. Thus, these results are not necessarily in conflict with the extensive qualitative research of lived experiences of young people for whom the gap-year may well have been extremely beneficial. Furthermore, these results cannot speak to whether a school guidance counselor, for example, should suggest a gap-year to a young person based on their individual circumstances. Rather they do suggest that more research is needed before providing general non-targeted incentives for youth to undertake a gap-year.

Second, the current research consists of secondary analysis of existing large

longitudinal databases. The size, prospective design, ability to track young people after high-school across multiple transition pathways, and extensive coverage of the developmental period of interest mean that these databases are uniquely well-suited to answering the research questions presented here. They were, however, not designed to assess gap-years solely and thus the outcome variables of interest were necessarily narrow. Qualitative gap-year literature suggests a wealth of benefits for the period. As noted earlier, such research has important limitations, but it does have the benefit of being able to consider a depth that was not possible here. Nevertheless, our results, and lifespan theory of control more generally, are sufficient to suggest that governments and educational institutions should be wary of gap-years as a general undifferentiated policy initiative until further research based on strong quasi-experimental designs can assess the range of reported benefits. This is particularly the case when taking the potential productivity and earnings concerns of a gap-year for individuals and the wider community into consideration (see Crawford & Cribb, 2012; Holmlund et al., 2008).

Limitations

There are several limitations of this research that readers should consider when interpreting these findings. Firstly, while matching procedures provided greater confidence in the internal validity of the study, it is important to note the potential limitations for generalization to the wider population. Indeed, the Finnish study consisted of participants from a single city. While in the case of Study 2, the LSAY database was designed to be representative of the population in general at the initial time wave. There is, however, no guarantee that the sub-sample used here is representative of either direct university entrants or those that take a gap-year. Further research is also needed to consider whether these findings generalize to other countries where gap-years are popular.

The appropriateness of causal inference from propensity score matching models is dependent on achieving balance on all potential confounding variables (Thoemmes & Kim, 2011). While we balanced groups on a large range of variables it is possible that there are

other critical confounding variable we did not measure. We argue that our extensive matching procedure provides a stronger basis on which to evaluate the efficacy of a gap-year than is often done in this area, however, readers should consider the potential biasing effect of unmeasured variables on these results regardless. Finally, all variables in this research were self-report. While this is generally appropriate for assessing psychosocial outcomes it is also clear there are limitations. This is particularly evident in the Australia study where 10% of those in the direct university entry sample who had indicated they were in university one year after high-school, indicated they had never attended university (this was the case using both multiple imputations and listwise deletion, so is not a function of the missing data model). While these issues are problematic for all self-report measures and we provide reasonable hypotheses to account for this self-report concern, such explanations remain "just-so" stories until objective data can validate the findings here.

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Table 1

Study 1: Model Comparison

	Goals			
Model Comparison	Strain	Commitment	Expectations	Effort
	Before Matching			
No growth vs Linear: χ^2 (4)	19.65***	59.92***	81.5***	80.4***
Linear vs Quadratic: χ^2 (2)	0.98	6.8	4.83	9.96
	After Matching			
No growth vs Linear: χ^2 (4)	21.73***	78.98***	84.89***	102.30***
Linear vs Quadratic: χ^2 (2)	0.45	5.25	3.43	10.71

Notes. Results come from pooled log likelihood ratio tests. *** $p < .001$. Random parameters include intercept and linear slope.

Table 2

Study 1: Unmatched and Matched Results

	Goals			
Parameter	Strain	Commitment	Expectations	Effort
		Before Matching		
Intercept	4.73 [4.47, 4.99]	6.03 [5.84, 6.23]	5.17 [4.96, 5.38]	4.18 [3.92, 4.43]
Time Wave	0.13 [0.01, 0.24]	0.08 [-0.02, 0.18]	0.23 [0.13,0 .34]	0.25 [0.11, 0.39]
Group	-0.47 [-1.04, 0.10]	-0.62 [-0.94, -0.30]	-0.36 [-0.79, 0.07]	-0.94 [-1.39, -0.49]
Group by Time Wave	0.04 [-0.24, 0.33]	0.18 [0.02, 0.35]	0.16 [-0.09, 0.40]	0.32 [0.08, 0.55]
		After Matching		
Intercept	4.52 [4.14, 4.90]	5.69 [5.41,5.98]	5.00 [4.67, 5.34]	3.33 [2.88, 3.79]
Time Wave	0.18 [0.04, 0.33]	0.16 [0.00, 0.32]	0.33 [0.15, 0.52]	0.54 [0.30, 0.77]
Group	-0.10 [-0.84, 0.65]	-0.19 [-.61, 0.22]	-0.16 [-0.62, 0.30]	-0.01 [-0.63, 0.62]
Group by Time Wave	-0.07 [-0.44, 0.28]	0.07 [-0.13, 0.26]	0.05 [-0.15, 0.25]	0.02 [-0.21, 0.24]

Notes. Results come from multilevel growth curve models. Point estimates are given with 95% CI given in square brackets.

Table 3

Study 2: Model Comparison

	Satisfaction		
Model Comparision	Life	Career Prospects	Future Prospects
	Before Matching		
No growth vs Linear: χ^2 (2)	60.37***	23.96***	1.20
Linear vs Quadratic: χ^2 (2)	55.40***	34.74***	16.71***
Quadratic vs Cubic: χ^2 (2)	3.30	31.17***	1.97
Cubic vs Quartic: χ^2 (2)	1.50	28.08***	0.29
	After Matching		
No growth vs Linear: χ^2 (2)	75.38***	18.99***	4.25
Linear vs Quadratic: χ^2 (2)	30.52***	32.24***	6.35
Quadratic vs Cubic: χ^2 (2)	3.03	20.32***	1.42
Cubic vs Quartic: χ^2 (2)	1.17	16.44**	0.78

Notes. Results come from pooled log likelihood ratio tests. ** $p < .01$; *** $p < .001$. All models contain a random intercept.

Table 4

Study 2: Unmatched and Matched Results

	Satisfaction		
Parameter	Life	Career Prospects	Future Prospects
	Before Matching		
Time Wave			
Intercept	3.46 [3.42, 3.50]	3.94 [3.53, 4.35]	3.35 [3.30, 3.40]
Linear	0.08 [0.05, 0.11]	-1.21 [-1.97, -.46]	0.06 [0.03, 0.10]
Quadratic	-0.02 [-0.02, -0.01]	0.84 [.38, 1.30]	-0.01 [-0.02, -0.01]
Cubic	--	-0.23 [-0.34, -0.12]	--
Quartic	--	0.02 [0.01, 0.03]	--
Interaction			
Intercept	0.08 [-0.02, 0.17]	-0.36 [-1.24, 0.52]	0.06 [-0.05, 0.17]
Linear	-0.01 [-0.08, 0.06]	0.64 [-0.99, 2.27]	-0.03 [-0.12, 0.05]
Quadratic	0.00 [-0.01, 0.01]	-0.37 [-1.36, 0.61]	0.01[-0.01, 0.02]
Cubic	--	0.09 [-0.15, 0.33]	--
Quartic	--	-0.01 [-0.03, 0.01]	--
	After Matching		
Time Wave			
Intercept	3.55 [3.49, 3.60]	3.85 [3.34, 4.35]	3.44 [3.42, 3.46]
Linear	0.04 [-0.00, 0.08]	-1.10 [-1.97, -0.09]	--
Quadratic	-0.01 [-0.02, -0.01]	0.73 [0.16, 1.30]	--
Cubic	--	-0.20 [-0.36, -0.06]	--
Quartic	--	0.02 [0.01, 0.03]	--
Interaction			
Intercept	-0.04 [-0.14, 0.07]	-0.24 [-1.21, 0.73]	-0.01 [-0.04, 0.04]
Linear	0.05 [-0.04 0.13]	0.39 [-1.39, 2.18]	--
Quadratic	-0.01 [-0.03, 0.01]	-0.27 [-1.29, 0.75]	--
Cubic	--	0.05 [-0.20, 0.31]	--
Quartic	--	-0.01 [-0.03, 0.02]	--

Notes. Results come from multilevel growth curve models. Point estimates are given with 95% CI given in square brackets.