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# Trajectories of self-esteem in extremely low birth weight survivors through adulthood☆

Kristie L. Poole[a,*], Louis A. Schmidt[a], Saroj Saigal[b], Michael H. Boyle[c], Katherine M. Morrison[b], Ryan J. Van Lieshout[c]

[a] Department of Psychology, Neuroscience & Behaviour, McMaster University, Canada
[b] Department of Pediatrics, McMaster University, Canada
[c] Department of Psychiatry and Behavioural Neurosciences, McMaster University, Canada

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ABSTRACT

Although the developmental course of self-esteem has been examined in general population samples, there is a lack of research examining the trajectory of self-esteem in populations who experience unique developmental challenges. We compared the trajectory of self-esteem in extremely low birth weight (ELBW; < 1000 g) survivors and normal birth weight (NBW) controls from mid-adolescence through their early 30s. Self-esteem was reported during three follow-up periods (age 12–16, age 22–26, age 30–35). Adjusting for sex, chronic health problems, socioeconomic status, and social support, no difference was noted in self-esteem in the two groups in adolescence, but birth weight status predicted rate of change of self-esteem from adolescence to adulthood. The NBW controls showed the expected, normative *increases* in self-esteem from mid-adolescence to young adulthood, while ELBW individuals displayed stable, relatively low levels of self-esteem into young adulthood. Our findings highlight that ELBW survivors may not experience the normative trajectory of self-esteem into young adulthood.

## 1. Introduction

Self-esteem is one's evaluative appraisal of everything an individual can assess about him/herself resulting in a general sense of worthiness and satisfaction of self (Mann, 2004). Self-esteem is one of the most robust predictors of long-term functioning across multiple domains that are important for healthy development (Brooks, 1992; Mann, 2004; Orth, Robins, & Roberts, 2008). Previous research has shown that positive self-esteem across development is predictive of healthy social relationships, better physical health, improved mental health, as well as educational and occupational attainment (Murray, Holmes, & Griffin, 2000; Murray, Rose, Bellavia, Holmes, & Kusche, 2002; Trzesniewski, Donnellan, & Robins, 2003; Vingilis, Wade, & Adlaf, 1998). Conversely, poor self-esteem in early life places children and adolescents at risk for poorer developmental trajectories. For example, children experiencing low self-esteem are more likely to engage in risky behaviors such as early sexual activity, suicidal ideation, and disordered eating during adolescence (McGee & Williams, 2000). Adolescents with low self-esteem are also at greater risk for maladaptive outcomes in emerging adulthood such as lower success in educational and occupational attainment, poorer mental health (e.g., internalizing disorders, substance abuse), criminal behaviors, and poorer physical health (Orth et al., 2008; Steiger, Allemand, Robins, & Fend, 2014; Trzesniewski et al., 2006).

Given the importance that self-esteem plays on one's functioning in several domains, a body of research has examined the developmental course of self-esteem, as well as investigated factors that may underlie these trajectories in general population samples. However, relatively little research has examined the developmental course of self-esteem in special populations. Accordingly, the objective of the present study was to examine the trajectory of self-esteem in individuals who were born at extremely low birth weight (ELBW; < 1000 g) from mid-adolescence to young adulthood.

### 1.1. Developmental course of self-esteem in general population samples

During the preschool years, children tend to have inflated views of themselves (Robins & Trzesniewski, 2005), resulting in relatively high self-esteem during this developmental period. However, as children undergo cognitive development across the school-aged years, they

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* Corresponding author at: McMaster University, Room 130, Psychology Building, 1280 Main Street West, Hamilton, Ontario L8S 4K1, Canada.
*E-mail address:* poolekl@mcmaster.ca (K.L. Poole).

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begin to compare themselves with their peers, and integrate external influences into their view of themselves, yielding a more realistic sense of self relative to early childhood (Orth, Robins, & Widaman, 2012). As children enter adolescence, they undergo considerable cognitive and physical maturation, develop complex peer and romantic relationships, and have an increasing number of responsibilities (Orth, Trzesniewski, & Robins, 2010). During adolescence, individuals are particularly aware of how they perform relative to their peers and become increasingly critical of themselves, resulting in vulnerability to experiencing lower self-esteem during this time.

The transition from adolescence to emerging adulthood (i.e., late teenage years to early twenties) is another period in which alterations in self-esteem are likely to occur (Chung et al., 2014). Emerging adulthood is a developmental period characterized by frequent change and identity exploration, and an increase in self-focus (Arnett, 2000). It is considered to be a transition period between adolescence and young adulthood, with lower dependency on others relative to adolescence, but not yet having the full responsibilities that accompany young adulthood (Arnett, 2000). Importantly, the developmental changes and shifts during this period may result in increasing stability in one's educational, occupational, and social roles, and accompanying increases in the evaluations of one's self (Arnett, 2000). Similarly, as individuals progress from emerging adulthood to young adulthood (e.g., late twenties to mid-thirties), self-esteem is likely to continue to increase. Reasons for this are that the transition to young adulthood is generally characterized by stability in several important domains. For example, young adults have typically attained stable employment, formed close relationships, and developed a sense of control over the self. Collectively, these factors serve to underlie increases in self-esteem. Attaining positions of status and stability promotes the continued development of positive self-esteem into middle adulthood (Orth et al., 2010). Finally, the transition from middle adulthood to old age represents a normative decline in self-esteem due to increasing levels of instability (Orth et al., 2010), resulting from changes in social roles (e.g., death of loved ones, lowered social support, retirement), declining physical health (e.g., chronic disease, functional limitations), and a reduction in socioeconomic status (SES) (Baltes & Mayer, 1999; Orth et al., 2010).

### 1.2. Self-esteem development in special populations

Although the developmental course of self-esteem has been examined in general population samples, there is a lack of research examining the trajectory of self-esteem in populations who experience unique developmental challenges relative to general population samples, such as individuals who were born preterm. For this reason, it remains unclear whether normative trajectories of self-esteem described above are generalizable to this special population.

There are a number of reasons to expect that the trajectory of self-esteem might differ among survivors of preterm birth relative to typically developing individuals. First, although trajectory studies of outcomes in ELBW survivors are limited, some emerging evidence suggests that this population may experience lower health-related quality of life from adolescence until their early thirties (Saigal et al., 2016). Further, studies examining general personality and social development of emerging and young adults born preterm have found that they display higher levels of introversion, shyness, and neuroticism and are also more risk aversive compared to their typically developing peers (Eryigit-Madzwamuse, Strauss, Baumann, Bartmann, & Wolke, 2015; Hertz, Mathiasen, Hansen, Mortensen, & Greisen, 2013; Pyhälä et al., 2009; Schmidt, Miskovic, Boyle, & Saigal, 2008; Waxman, Van Lieshout, Saigal, Boyle, & Schmidt, 2013). These psychosocial factors tend to be correlated with self-esteem, but the longitudinal course of this construct has not been examined in this population.

Second, the roots of self-esteem are influenced by deviations from normal development which often emerge early in life, and are typically chronic (Aleksandrowicz & Aleksandrowicz, 1987). Survivors of prematurity are exposed to significant pre- and post-natal adversity, which increases the risk of developmental difficulties across physical, mental, and social domains (Anderson & Doyle, 2008; Mathewson, Chow, et al., 2017; Saigal & Doyle, 2008). Collectively, these factors may alter or redirect normative trajectories of self-esteem development.

Third, the developmental milestones and markers underlying mean-level change of self-esteem across the developmental periods described above (e.g., changing social roles, physical health decline, reduced SES) are assumed to be age-dependent and normative. However, the timing of these events and the associated developmental changes may occur at different ages for different populations, including those born at ELBW. For example, emerging adults who were born preterm show delays in marriage, cohabitating with a partner, and experiencing sexual intercourse relative to their term peers (Männistö et al., 2015). Further, adult survivors of extreme prematurity experience significantly reduced social support and more loneliness, have lower socioeconomic status, and an increased number of chronic health problems relative to typically developing normal birth weight (NBW) controls (Saigal et al., 2016). Given that these are significant predictors of reduced self-esteem and markers of self-esteem instability in individuals who are entering later adulthood (Orth et al., 2010), these factors may also serve to differentially affect trajectories of self-esteem in adulthood for individuals born at ELBW.

### 1.3. The present study

We used a prospective, longitudinal study design to test whether the trajectory of self-esteem from mid-adolescence through young adulthood differed depending on developmental context by examining the influence of birth weight status (i.e., NBW versus ELBW), adjusting for factors known to play an important role in self-esteem development into adulthood (Orth et al., 2010). Exploring the longitudinal development of self-esteem in individuals born at ELBW can provide important insights into how very early influences may shape self-esteem and shed light on how developmental context may affect these trajectories. Such work has implications for the timing of targeted, developmentally sensitive interventions that could foster positive self-esteem across the lifespan for survivors of prematurity. We predicted that individuals born at NBW would experience the normative increases in self-esteem from mid-adolescence to young adulthood, whereas the survivors of ELBW would display self-esteem levels that remained at stable, relatively low levels across follow-up assessments.

## 2. Method

### 2.1. Sample overview

The ELBW sample was recruited at birth and comprised 397 predominantly Caucasian infants born at < 1000 g between 1977 and 1982 to residents of central-west Ontario. Of these, 179/397 (45%) survived to hospital discharge. Ten children subsequently died, leaving 169 ELBW survivors at age 8. The ELBW sample was representative of the ELBW children born at the time of the study in this region.

In the present study, all participants with neurosensory impairment (NSI), defined as the presence of at least one of: cerebral palsy, blindness, deafness, intellectual disability, and microcephaly diagnosed in childhood by a neonatologist or developmental pediatrician, were excluded from analyses because they have unique challenges that are not generalizable to the majority of those born preterm. A total of 51 ELBW participants had a NSI and were not included in the present study. Follow-up assessments on the cohort have been conducted during childhood (8 years), mid-adolescence (12 to 16 years), emerging adulthood (22 to 26 years), and young adulthood (30 to 35 years). However, the childhood (8 years) data collection visit was not included in the present study. After excluding participants with NSI, at the age