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Better than my past self: Temporal comparison raises children's pride without triggering superiority goals

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Better Than My Past Self: Temporal Comparison Raises Children's Pride Without Triggering Superiority Goals

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Western societies offer children many opportunities for downward social comparisons (i.e., comparing oneself favorably to others). Such comparisons make children feel proud of themselves but could inadvertently trigger a desire to be superior to others. How can children be made to feel proud without triggering a desire for superiority? We hypothesized that downward temporal comparisons (i.e., comparing one's current self favorably to one's past self) can make children feel proud and give them a sense of insight and progress, without triggering a desire for superiority. We randomly assigned 583 children ($M_{age} = 11.65$, $SD = 1.92$) to engage in social comparisons (downward or upward), temporal comparisons (downward or upward), or no comparison. As hypothesized, downward social and temporal comparisons both made children feel proud, but only temporal comparisons did so without triggering superiority goals. Relative to social comparisons, temporal comparisons gave children a sense of progress and insight. These comparison effects were similar across middle-to-late childhood (ages 8–10), early adolescence (ages 11–13), and middle adolescence (ages 14–16). Collectively, our findings suggest that social comparisons contribute a competitive interpersonal orientation marked by a desire for superiority. Temporal comparisons, in contrast, shift children's goals away from being better than others toward being better than their own past selves.

Keywords: social comparison, temporal comparison, childhood, adolescence, self-concept

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Western societies want children to feel special and exceptional (Brummelman, Thomaes, & Sedikides, 2016; Twenge, 2006; Young-Eisendrath, 2008) and so offer children many opportunities for downward social comparison (i.e., comparing oneself favorably to others). For example, adults tell children that they are better than their peers (Kohn, 1992). Sport tournaments, such as Junior Olympics, and TV shows, such as MasterChef Junior, award children who outperform others. Educational systems typically provide children with normative grading (Dijkstra, Kuyper, van der Werf, Buunk, & van der Zee, 2008; Levine, 1983). Some

schools select and publicly announce "the best student" of the day, week, month, or year (Csermely, 2003). Most of those downward social comparison opportunities are so common in daily life that they are usually glossed over (Kohn, 1992).

Such downward comparisons could make children feel proud of themselves but could also trigger a desire for superiority toward others, as cultural commentators have noted in concern (Clark, 2017; Mirgain, 2015). How, then, can children feel proud of themselves in the absence of a desire to be superior? We proposed that they can do so via downward temporal comparisons (i.e.,

comparing one's present self favorably to one's past self). We tested this proposal in a randomized experiment. We focused on mid-to-late childhood through mid-adolescence, an age period where children frequently and spontaneously engage in comparisons for the purpose of self-evaluation (Harter, 2012).

Social Comparisons

Children use social comparisons as a benchmark to acquire or increase self-knowledge (Festinger, 1954; Wedell & Parducci, 2000). Indeed, from early childhood onward, they engage in social comparisons spontaneously (Mosatche & Bragonier, 1981) and strategically (Harter, 2012) to evaluate themselves (Butler, 1998; Cimpian, 2017; Dijkstra et al., 2008). Social comparisons typically entail perceiving others as better than oneself (upward social comparison; Collins, 1996) or as worse than oneself (downward social comparison; Wills, 1981).

Downward social comparisons highlight how children are better than others, which could make them feel proud of themselves (Harter, 2012). By contrast, upward social comparisons highlight how children are worse than others, which could make them feel ashamed of themselves (Collins, 1996; Smith, 2000). Preliminary evidence is consistent with these propositions. When asked to describe a prideful moment, children often mention outperforming others (Seidner, Stipek, & Feshbach, 1988), and children who outperform others display pride-relevant nonverbal behaviors, such as an erect posture and a broad smile (Garcia, Janis, & Flom, 2015). In addition, adults who engage in upward social comparison (Gilbert, 2000) or are exposed to better-off others (Cash, Cash, & Butters, 1983; Haferkamp & Krämer, 2011) often evaluate themselves negatively.

However emotionally gratifying downward social comparisons may be, they are likely to trigger in children a desire to be superior to others. When individuals perceive an unfavorable discrepancy between the self and ideal standards (e.g., when they are outperformed by others), they seek to reduce this discrepancy (Higgins, 1987) by striving to be as good as others or superior to them (Festinger, 1954). Even if the perceived discrepancy favors the self, individuals aspire to maintain or increase it (Sedikides & Gregg, 2008; Wills, 1981). Such superiority goals can drive individuals into a vicious cycle of competition (Garcia, Tor, & Schiff, 2013; Tesser, 1988). Although the idea that social comparisons trigger superiority goals has not been directly tested, tangential evidence suggests that social comparisons can instigate a competitive interpersonal orientation (Hoffman, Festinger, & Lawrence, 1954; Pemberton & Sedikides, 2001).

Temporal Comparisons

Here, we are concerned with another form of comparisons, namely, past temporal comparisons (henceforth, temporal comparisons). These can inform if one's current self is better than one's past self (downward temporal comparison; Albert, 1977) or is worse than one's past self (upward temporal comparison; Wilson & Ross, 2000). Although the literature on social comparisons has been blossoming for decades, research on temporal comparisons is surprisingly thin. One reason for this scarcity is that scholars typically assume individuals engage in temporal comparisons only when social comparisons are unavailable (Goolsby & Chaplin,

1988; Wedell & Parducci, 2000). Yet, individuals engage in temporal comparisons frequently and spontaneously, even when social comparisons are available (Wilson & Ross, 2000). Indeed, from age 5–6, children can compare their current and past outcomes (e.g., the quality of their drawings), when these outcomes are presented to them (Butler, 1998). From age 6–7, they can compare mental representations of their present self and past self and make inferences about change within the self across time (Butler, 1998; Harter, 2012).

We propose that downward temporal comparisons can make children feel proud of themselves without triggering a desire for superiority. Downward temporal comparisons can do so by highlighting how much children have improved over time. Such comparisons evoke favorable self-evaluation in adults (Wilson & Ross, 2000) and are theorized to be a source of pride in children (Buechner, Pekrun, & Lichtenfeld, 2018). Indeed, scholars have theorized that showing children how they have improved over time could make them feel competent (Butler, 1987) and proud (Weiner, 2005). One correlational study found that children report feeling proud when they have progressed over time (Buechner et al., 2018). Conversely, upward temporal comparisons could make children feel ashamed of themselves for failing to meet their internal standards, which is a common source of shame (Lewis, 1992; Tracy & Robins, 2004). Thus, downward and upward temporal comparisons can trigger pride and shame in children, respectively.

Unlike social comparisons, however, temporal comparisons may guide children away from superiority goals and toward improvement goals. Temporal comparisons, by their very nature, do not involve contrasts with others (Albert, 1977; Suls & Mullen, 1982). Any perceived discrepancy resulting from temporal comparisons is between one's present and past self. As individuals are motivated to minimize such discrepancies (Carver & Scheier, 1981; Higgins, 1987), they would compete with their own past self—not with others. Downward temporal comparisons could encourage children to further improve themselves, as they desire to maintain their improvement trajectories (Albert, 1977). Similarly, upward temporal comparisons could trigger in children a desire to improve themselves, thus encouraging remedial effort (Albert, 1977), as children want to move toward a desired future self (Markus & Nurius, 1986). Thus, temporal comparisons could focus children on improving themselves, more so than on being superior to others.

Unlike social comparisons, temporal comparisons highlight people's cross-time trajectories of their self (Ryff, 1991; Zell & Alicke, 2009). We theorize that, by emphasizing how, over time, children are moving toward a desired self, temporal comparisons can give children a sense of progress (Higgins, 1987; Sedikides & Hepper, 2009); and by demonstrating that their self is not a static entity but rather malleable across time, temporal comparisons can give children a sense of insight (Wilson & Ross, 2001; Zell & Krizan, 2014). Thus, when children engage in temporal comparisons, they may experience a sense of progress and insight.

Although no study has examined these possibilities, indirect evidence suggests that contexts that stimulate downward temporal comparisons contribute to an improvement orientation (Covington, 1992). For example, classroom contexts that encourage surpassing one's own outcomes across time instead of those of others conduce to children adopting a learning goal orientation—a desire to im-

prove oneself rather than to outperform others (Ames & Archer, 1988; Meece, Anderman, & Anderman, 2006). Likewise, praise for mastery (e.g., "You seem to really be getting the hang of it!"), which suggests outperforming oneself, makes children persist on the task at hand and solicit more challenging tasks, in an attempt to better themselves (Corpus, Ogle, & Love-Geiger, 2006; Kamins & Dweck, 1999).

With its emphasis on the malleability of the self, downward temporal comparison might seem similar to growth mindset—the belief that one's attributes (e.g., ability) can grow and develop through effort and education (Dweck, 2006). Individuals with a growth mindset desire predominantly self-improvement; for example, they embrace challenging tasks and persist in the face of struggles or failures (Blackwell, Trzesniewski, & Dweck, 2007; Romero, Master, Paunesku, Dweck, & Gross, 2014). Temporal comparisons may be a strategy for individuals with a growth mindset to evaluate their attributes, because these comparisons— more so than social comparisons—align with their belief that attributes can change over time (Dweck & Molden, 2017). Consistent with this possibility, evidence indicates that adolescents with a growth mindset are more likely to judge their own ability based on temporal comparison feedback than on social comparison feedback (Butler, 2000).

Unlike individuals with growth mindset, those with a fixed mindset believe that their attributes are fixed and unchangeable. Individuals with a fixed mindset desire predominantly to demonstrate their high ability or to mask their low ability (Dweck & Leggett, 1988). They tend to avoid challenging tasks, as failure would signal low ability; and they may not persist in the face of struggles or setbacks, as they perceive effort to be an indication of low ability (Dweck & Leggett, 1988; Robins & Pals, 2002). Social comparison may be a tool for individuals with a fixed mindset to evaluate their attributes. Given that "relative standing is . . . much less likely to show change than comparison with self" (Ruble & Flett, 1988, p. 104), individuals with a fixed mindset may find social comparison feedback more informative than temporal comparison feedback (Butler, 2000). Indeed, evidence indicates that adolescents with a fixed mindset are more likely to judge their own ability based on social comparison feedback than on temporal comparison feedback (Butler, 2000). In all, temporal and social comparisons are essential tools for self-evaluation and, as constructs, they are distinct from mindsets. The current investigation is the first to isolate the causal effects of temporal and social comparison on affective states and goal pursuits.

Developmental Trends

From what age are children's affective states and goal pursuits influenced by social and temporal comparisons? Young children are capable of social and temporal comparisons (Butler, 1998), but they rarely use such comparisons to evaluate themselves (Ruble, Boggiano, Feldman, & Loebl, 1980; Ruble, Feldman, & Boggiano, 1976). From age 8, children become able to form global self-evaluations (e.g., "I like myself as a person") and start using social and temporal comparisons for self-evaluation (Harter, 2012; Ruble & Frey, 1991). It has been theorized that, from this age onward, social comparisons, unlike temporal comparisons, might hinder self-improvement (Ruble, Grosovsky, Frey, & Cohen, 1992). For example, when children are outperformed by others, they may feel

that they are low in ability and there is not much they can do to change that (Lapan & Boseovski, 2017; Ruble et al., 1992). Thus, we focused on this critical developmental period and tracked the effects of social and temporal comparisons across middle-to-late childhood (ages 8–10), early adolescence (ages 11–13), and middle adolescence (ages 14–16).

What does extant research tell us about developmental trends in social and temporal comparisons? During middle-to-late childhood, children's environments are rich in social comparison information (e.g., normative grades, competitive classroom assignments; Cimpian, 2017; Ruble et al., 1976; Ruble & Flett, 1988; Veroff, 1969). Perhaps as a result, children may be more interested in social comparison feedback than in objective performance feedback (Butler, 1999). Unlike younger children, those age 8 or older use social comparison information to estimate their ability and future performance (Butler, 1996; Pomerantz, Ruble, Frey, & Greulich, 1995; Ruble et al., 1980). In early adolescence, around the transition to secondary school, children become even more interested in social comparisons (Keil, McClintock, Kramer, & Platow, 1990), which help them assess if they meet the expectations of their new social environments (Chartrand, Ruble, & Trope, 2001; Midgley, Anderman, & Hicks, 1995; Ruble & Frey, 1991). Similar to 8-year-olds, 10- to 11-year-olds readily use social comparison information for self-evaluation (Ruble, Parsons, & Ross, 1976). As children move into middle adolescence, they continue to engage in social comparisons (Keil et al., 1990), especially upward ones (van der Aar, Peters, & Crone, 2018), which may motivate them to be as good as others (Buunk, Kuyper, & van der Zee, 2005; Ruble, 1994).

Like social comparisons, temporal comparisons may wax and wane. During middle-to-late childhood, children's environments are rich in temporal comparison information (e.g., information on their learning curves in school; see Eccles et al., 1993; Nicholls & Miller, 1983). At this age, children are able to reflect back on their past selves and imagine how they have changed over time (Fivush, 2001; Fivush & Schwarzmueller, 1998; Van Abbema & Bauer, 2005). However, they may be more interested in social than temporal comparison feedback (Ruble & Flett, 1988). For example, 9-year-old children may prefer social over temporal comparison information, especially if they are low in ability (Ruble & Flett, 1988). As children grow older, they begin to prefer temporal comparisons over social comparisons for self-evaluation (Frey & Ruble, 1990; Ruble et al., 1992), probably because they realize that these comparisons can be more gratifying (Ruble, Eisenberg, & Higgins, 1994). As children move to early adolescence and transition into secondary school, they may engage in more temporal comparisons, especially downward ones, which make them feel certain and good about their skills (Albert, 1977). During middle adolescence, as children become more certain about their relative social standing, they may become more interested in temporal comparison information (Ruble & Frey, 1991).

Taken together, there is evidence that, from age 8, social and temporal comparisons impact children's self-evaluation, and thus possibly shape children's affective states and goal pursuits. Preliminary evidence suggests that the consequences of these comparisons may remain relatively stable after age 8. For example, in one study, children inferred higher ability after outperforming others than after being outperformed by others, and this effect did

not differ significantly across middle-to-late childhood, early adolescence, and mid-adolescence (Keil et al., 1990). However, there is no research that has jointly compared the influence of social and temporal comparisons across these developmental groups. Our study is the first to provide a stringent test in a highly powered experimental paradigm.

Overview

We developed a novel hypothesis, namely, that downward temporal comparison, unlike downward social comparison, makes children feel proud without making them desire superiority. We tested this hypothesis, for the first time, using a rigorous experimental design. To do so, we randomly assigned children to engage in social comparisons (downward or upward), temporal comparisons (downward or upward), or no comparison. We hypothesized that downward and upward comparisons would make children feel proud and ashamed, respectively, regardless of whether those comparisons were social or temporal. We hypothesized that social comparisons, unlike temporal comparisons, would trigger superiority goals. In addition, we hypothesized that temporal comparisons, more so than social comparisons, would steer children toward improvement (vs. superiority) goals and provide them with a sense of progress and insight.

An additional goal of our research was to explore developmental change and continuity in the effects of social and temporal comparison. We focused on the theoretically relevant subgroups of middle-to-late childhood (ages 8–10), early adolescence (ages 11–13), and middle adolescence (ages 14–16). Rather than testing the effects of social and temporal comparisons within each age group separately, we examined whether age group would moderate the effects of social and temporal comparisons—an approach that allowed us to test whether potential differences between age groups were statistically significant (Nieuwenhuis, Forstmann, & Wagenmakers, 2011).

In our experimental manipulation of social and temporal comparisons, we sought to capture their core features. That is, we highlighted *specific persons* (i.e., being better or worse than peers) for social comparisons and *trajectories* (i.e., getting better or worse) for temporal comparisons. This concurs with theoretical accounts, which posit that a trajectory is at the core of temporal (but not social) comparisons. For example, leading scholars argued that "temporal comparison serves the function of . . . allowing [people] to evaluate and adjust to changes in aspects of the self that occur over time" (Albert, 1977, p. 488) and people who engage in temporal comparison "perceive themselves as undergoing change" (Albert, 1977, p. 491). By contrast, social comparison information is more relevant than temporal comparison information so as to assess ability as a stable characteristic "because relative standing is . . . much less likely to show change than comparison with self or absolute standards" (Ruble & Flett, 1988, p. 104). Highlighting trajectories for temporal comparisons is also consistent with existing work on similar age groups, in which children were told the following: "Now you can see whether your scores changed over time as you worked. Your scores for each problem were 1 2 1 2 3 3" (Butler, 2000, p. 972), or were asked to reflect on how someone may have "consistently improved over time" (Ruble et al., 1994, p. 1100). By highlighting the core characteristics of each type of

comparison, we were able to capture their differential effects on children and adolescents.

Method

Participants

All children from sixth, seventh, and eight grade of primary schools and from first, second, third, and fourth grade of secondary schools were eligible for participation. Participants were 583 students (54.4% girls) aged 8–18 years (M_{age} = 11.65, SD = 1.92; 96.9% ethnic Dutch) recruited from seven elementary (n = 329) and five secondary (n = 254) schools that served middle-class communities in the Netherlands. Participants received active parental consent (parental consent rate = 67%). All procedures were approved by the Ethics Review Board of the Faculty of Social and Behavioral Sciences, University of Amsterdam (2016-CDE-7421). A power analysis based on a medium effect size (f = .25) for detecting the Comparison Type (social, temporal, none) × Comparison Direction (downward, upward, none) interaction on self-feelings and goals led to a targeted sample of 302 participants (power = 95, α = .05; Faul, Erdfelder, Lang, & Buchner, 2007). Similar to a previous study (Yeager, Lee, & Jamieson, 2016), final sample size was determined by the maximum number of parents who were willing to provide consent.

Experimental Manipulation

We manipulated comparisons by having children engage in a reading and writing exercise for approximately 15 min in their classrooms. Children received a closed booklet that contained written instructions (see Table S1 in the online supplemental material). We randomly assigned them, on an individual basis, to reflect back on and write about a personal experience involving: downward social comparison (n = 116), upward social comparison (n = 119), downward temporal comparison (n = 118), upward temporal comparison (n = 117), or no comparison (n = 113). We carried out the random assignment by handing out closed booklets in a predetermined, randomized order. Given that the booklet covers were identical, research assistants and teachers remained unaware of condition assignment.

In each of the four comparison conditions, children first selected a domain central to their identity (i.e., schoolwork, sports, music, and friendship). Most of them selected the domain friendship (37.53%), followed by schoolwork (33.04%), sports (26.23%), and music (3.20%). In the downward social comparison condition, children were asked to think and write about a time when they were better than their peers at the self-selected domain. For example, a 10-year-old boy wrote the following: "I'm much smarter than most others. I often know the answer sooner and I finish my work earlier."

In the upward social comparison condition, children were asked to think and write about a time when they were worse than their peers at the self-selected domain. For example, a 9-year-old boy wrote the following:

> We went to the gym and we had to do some exercises. I was the only one who couldn't do them. We formed groups, and I was grouped with many children who did well. When we started, I felt like the

ground beneath [my feet] disappeared. I had to go first and I felt really ashamed.

In the downward temporal comparison condition, children were asked to think and write about a time when they got better at the self-selected domain. For example, a 13-year-old girl wrote the following:

I got better at horse riding. That's because I trained really hard every Saturday, researched lots of things about horse riding, and contacted experts for finding out their strategies. I also asked my mom to film me while I was horse riding to learn in what ways I can do better.

In the upward temporal comparison condition, children were asked to think and write about a time when they got worse at the self-selected domain. For example, a 12-year-old girl wrote the following:

I was in 7th grade and I was always getting three stars for technical reading. Later, I started getting two stars. That really pissed me off. I thought that I was bad at it and I felt sad and stupid.

In the control condition, children were asked to select the domain which was important to other children, but not to themselves. Most of the children selected the domain music (66.07%), followed by sports (17.86%), friendship (10.71%), and schoolwork (5.36%). Next, they were asked to think and write about a time when they noticed that the selected domain was important to their peers. For example, a 12-year-old boy wrote the following: "For some people it [making music] is important because they like it very much and they dare to do it, I think that's great."

Outcome Measures

Next, children completed outcome measures, all rated on four-point scales ($1 = not\ at\ all\ true$, $4 = completely\ true$). We measured state pride using the five-item Pride subscale of The State Shame and Guilt Scale (Marschall, Sanftner, & Tangney, 1994). Sample items include the following: "I feel worthwhile, valuable" and "I feel pleased about something I have done" ($M = 2.61$, $SD = 0.78$, Cronbach's $\alpha = .89$). We measured state shame using the five-item Shame subscale of The State Shame and Guilt Scale (Marschall et al., 1994). Sample items include the following: "I want to sink into the floor and disappear" and "I feel small" ($M = 1.54$, $SD = 0.67$, Cronbach's $\alpha = .88$). We measured goal orientation using the Superiority and Improvement Goals Scale (developed for the purposes of this study). Three items assess superiority goals (e.g., "I want to be better than my peers;" $M = 2.07$, $SD = 0.83$, Cronbach's $\alpha = .90$) and three items assess improvement goals (e.g., "I want to improve myself," $M = 3.26$, $SD = 0.75$, Cronbach's $\alpha = .82$). Whereas superiority goals reflect the desire to be superior to others, improvement goals reflect the desire to improve oneself (i.e., to be superior to one's own past self). Factor analysis confirms that these subscales form two factors (see Table S2 in the online supplemental material). To index children's preference of improvement over superiority goals, we also calculated a ratio dividing the score of improvement goals by the score of superiority goals ($M = 1.82$, $SD = 0.84$; see Dweck, 2002, for similar reasoning). We measured sense of progress with two items (Sedikides, 2015): "I feel that I am moving forward" and "I feel that I am improving myself" ($M = 2.89$, $SD = 0.89$, $r = $

.76). We did not ask children to report their sense of insight. Instead, we analyzed children's writings using Linguistic Inquiry Word Count (LIWC; Pennebaker, Booth, Boyd, & Francis, 2015) software to calculate the number of insight words they used in those writings ($M = 2.42$, $SD = 3.02$). The *Oxford English Dictionary* defines *insight* as "the capacity to gain an accurate and deep understanding of someone or something," and the LIWC indexes insight with 459 words (e.g., understand, realize, learn, conclude) that have been validated through expert ratings (Pennebaker et al., 2015) and have been used successfully in prior work (Frattaroli, Thomas, & Lyubomirsky, 2011; Pennebaker & Francis, 1996). Debriefing concluded the experimental session.

Results

Preliminary Analyses

Data exclusion. We excluded data from six participants, because they did not complete the writing exercise (i.e., they did not write any word on the booklet for the writing exercise). The data set included one 17-year-old and one 18-year-old, but we retained those participants (excluding them did not change the results). The final sample consisted of 577 participants ($M_{age} = 11.65$, $SD = 1.91$). There were no condition differences in gender or age, ps > .548, indicating successful random assignment.

Statistical assumptions. Missingness (i.e., participants not completing one or more outcome measures) was less than 5% within each condition. There were no multivariate outliers (Cook's distances <1). There were six univariate outliers for shame ($z > 3.29$) and for improvement goals ($z < -3.29$), but excluding them from the analyses did not alter the results, and so we retained them. There were six univariate outliers for insight ($z > 3.29$) and excluding them from the analyses changed the significance level but not the pattern of results; so, we reported analyses with and without those outliers. The outcome variables were moderately skewed within each condition. Given that transformations to normalize their distributions (e.g., square root) did not affect the results pattern, and that our main analyses (i.e., analyses of variance [ANOVAs]) are robust against nonnormally distributed dependent variables (Schmider, Ziegler, Danay, Beyer, & Bühner, 2010), we decided not to transform the data, which eases interpretation (Tabachnick & Fidell, 2014). The assumption of homogeneity of variance was met ($F_{max} < 10$).

Manipulation check. Children's writings were coded by two independent coders. Given that the coders received transcribed versions of children's writings, without knowing the instructions that children received, they remained unaware of the study hypotheses and condition assignment. Coders assessed whether a specific type of comparison (downward social, upward social, downward temporal, upward temporal) was present (see the online supplemental material). Of all writings, 20% were coded by both coders; interrater reliability was high for each comparison type (Cohen's κs > .76). Discrepancies were resolved through discussion. Children's writings were rich in both social and temporal comparisons (see the online supplemental material). The manipulation was effective: Children in a comparison condition engaged in the specific type of comparison in which they were instructed to engage more so than children in the other comparison conditions (ps < .001; see the online supplemental material).

Main Analyses

We analyzed data using 3 (comparison type: social, temporal, none) $\times$ 3 (comparison direction: downward, upward, none) between-subjects ANOVAs separately for each outcome variable. We followed up significant effects with planned pairwise comparisons. In Table 1, we report descriptive statistics, and in Table 2 we report correlations among outcome variables. We set the alpha level at .05. Despite our directional hypotheses, we used two-tailed testing to provide more stringent tests.

Pride. There was a main effect of comparison direction, $F(1, 565) = 174.43$, $p < .001$, $\eta_p^2 = .24$, but neither a main effect of comparison type, $F(1, 565) = 0.16$, $p = .688$, $\eta_p^2 < .01$, nor an interaction, $F(1, 565) = 0.94$, $p = .332$, $\eta_p^2 < .01$. Relative to the control condition ($M = 2.59$, $SE = 0.07$), downward comparisons ($M = 3.05$, $SE = 0.05$) made children prouder ($p < .001$, 95% confidence interval [CI] for the mean difference $[-0.61, -0.30]$), whereas upward comparisons ($M = 2.20$, $SE = 0.05$) made them less proud ($p < .001$, 95% CI for the mean difference $[0.23, 0.55]$). Also, downward comparisons made children prouder than did upward comparisons ($p < .001$, 95% CI for the mean difference $[-0.97, -0.72]$). As hypothesized, both downward social comparison and downward temporal comparison made children feel proud of themselves.

Shame. There was a main effect of comparison direction, $F(1, 563) = 47.31$, $p < .001$, $\eta_p^2 = .08$, but neither a main effect of comparison type, $F(1, 563) = 0.78$, $p = .377$, $\eta_p^2 < .01$, nor an interaction, $F(1, 563) = 0.03$, $p = .853$, $\eta_p^2 < .01$. Relative to the control condition ($M = 1.57$, $SE = 0.06$), upward comparisons ($M = 1.74$, $SE = 0.04$) made children feel more ashamed ($p = .022$, 95% CI for the mean difference $[-0.32, -0.02]$), whereas downward comparisons ($M = 1.33$, $SE = 0.04$) made them feel less ashamed ($p = .001$, 95% CI for the mean difference $[0.09, 0.39]$). Also, upward comparisons made children feel more ashamed than did downward comparisons ($p < .001$, 95% CI for the mean difference $[-0.53, -0.29]$). As hypothesized, both upward social comparison and upward temporal comparison made children feel ashamed of themselves.

Superiority goals. There was a main effect of comparison type, $F(1, 559) = 5.48$, $p = .020$, $\eta_p^2 = .01$, but neither a main effect of comparison direction, $F(1, 559) = 0.03$, $p = .866$, $\eta_p^2 < .01$, nor an interaction, $F(1, 559) = 0.71$, $p = .399$, $\eta_p^2 < .01$.

Relative to the control condition ($M = 1.90$, $SE = 0.08$), social comparisons ($M = 2.20$, $SE = 0.05$) made children adopt superiority goals ($p = .002$, 95% CI for the mean difference $[-0.50, -0.12]$), whereas temporal comparisons ($M = 2.02$, $SE = 0.05$) did not ($p = .189$, 95% CI for the mean difference $[-0.32, 0.06]$). Social comparisons made children adopt superiority goals more than did temporal comparisons ($p = .020$, 95% CI for the mean difference $[-0.33, -0.03]$).

Improvement goals. There was no main effects of comparison type, comparison direction, or interaction, $F(1, 558) = 1.00$, $p = .318$, $\eta_p^2 < .01$, $F(1, 558) = 1.31$, $p = .252$, $\eta_p^2 < .01$, and $F(1, 558) = 0.01$, $p = .909$, $\eta_p^2 < .01$, respectively.

Improvement versus superiority goals ratio. There was a main effect of comparison type, $F(1, 558) = 8.44$, $p = .004$, $\eta_p^2 = .01$, but neither a main effect of comparison direction, $F(1, 558) = 0.15$, $p = .695$, $\eta_p^2 < .01$, nor an interaction, $F(1, 558) = 0.37$, $p = .541$, $\eta_p^2 < .01$. Relative to the control condition ($M = 1.85$, $SE = 0.08$), temporal ($M = 1.92$, $SE = 0.06$) and social ($M = 1.70$, $SE = 0.06$) comparisons did not make children adopt improvement versus superiority goals ($p = .455$, 95% CI for the mean difference $[-0.27, 0.12]$; $p = .188$, 95% CI for the mean difference $[-0.04, 0.35]$, respectively). However, relative to each other, temporal comparisons made children adopt improvement versus superiority goals more than did social comparisons ($p = .004$, 95% CI for the mean difference $[-0.38, -0.07]$). As hypothesized, temporal comparisons encouraged children to adopt improvement (vs. superiority) goals, regardless of whether those comparisons were downward or upward.

Progress. There was a main effect of comparison type, $F(1, 560) = 7.50$, $p = .006$, $\eta_p^2 = .01$. Relative to the control condition ($M = 2.54$, $SE = 0.08$), both temporal ($M = 3.08$, $SE = 0.06$) and social ($M = 2.87$, $SE = 0.06$) comparisons made children feel more progressed ($p < .001$, 95% CI for the mean difference $[-0.73, -0.35]$, $p < .001$, 95% CI for the mean difference $[-0.52, -0.14]$, respectively). As hypothesized, temporal comparisons made children feel more progressed than did social comparisons ($p = .006$, 95% CI for the mean difference $[-0.37, -0.06]$).

There was also a main effect of comparison direction, $F(1, 560) = 44.19$, $p < .001$, $\eta_p^2 = .07$. Relative to the control condition ($M = 2.54$, $SE = 0.08$), downward comparisons ($M = 3.24$, $SE = 0.06$) made children feel more progressed ($p < .001$, 95% CI for

Table 1

Means and Standard Deviations (in Parentheses) for Outcome Variables by Comparison Direction and Comparison Type (N = 577)

Variable	Downward comparisons	Upward comparisons	Social comparisons	Temporal comparisons	Control
Age (in years)	11.54 (1.86)	11.73 (1.91)	11.62 (1.94)	11.65 (1.83)	11.73 (2.04)
Pride	3.05 (0.57)	2.20 (0.79)	2.63 (0.83)	2.61 (0.78)	2.59 (0.69)
Shame	1.33 (0.50)	1.74 (0.74)	1.56 (0.67)	1.50 (0.65)	1.57 (0.69)
Progress	3.24 (0.69)	2.72 (0.94)	2.87 (0.95)	3.09 (0.76)	2.54 (0.90)
Superiority goals	2.11 (0.85)	2.12 (0.82)	2.20 (0.84)	2.02 (0.81)	1.90 (0.79)
Improvement goals	3.28 (0.73)	3.35 (0.71)	3.28 (0.79)	3.35 (0.65)	3.05 (0.82)
Ratio[a]	1.80 (0.83)	1.82 (0.84)	1.70 (0.79)	1.92 (0.86)	1.85 (0.88)
Insight	2.22 (2.99)	2.53 (2.89)	2.27 (2.89)	2.49 (3.00)	2.73 (3.36)

Note. Seven children had completely missing data on pride; nine children had completely missing data on shame; 12 children had completely missing data on progress; 13 children had completely missing data on superiority goals; 14 children had completely missing data on improvement goals and on improvement goals relative to superiority goals.

[a] Ratio refers to improvement goals relative to superiority goals.

Table 2
Correlations Among Outcome Variables (N = 577)

Variable	1	2	3	4	5	6	7	8
1. Age (in years)	—							
2. Pride	−.06	—						
3. Shame	−.02	−.46**	—					
4. Progress	−.05	.53**	−.25**	—				
5. Superiority goals	.04	.18**	.10*	.12**	—			
6. Improvement goals	−.09*	.24**	−.05	.44**	.35**	—		
7. Ratio[a]	−.13**	.00	−.17**	.18**	−.72**	.30**	—	
8. Insight	−.02	−.07	−.05	−.03	−.10*	−.04	.07	—

Note. Seven children had completely missing data on pride; nine children had completely missing data on shame; 12 children had completely missing data on progress; 13 children had completely missing data on superiority goals; 14 children had completely missing data on improvement goals and on improvement goals relative to superiority goals.
[a] Ratio refers to improvement goals relative to superiority goals.
* $p < .05$.   ** $p < .01$.

the mean difference [−0.89, −0.50]), whereas upward comparisons ($M = 2.72$, $SE = 0.06$) made them feel neither more nor less progressed ($p = .072$, 95% CI for the mean difference [−0.37, 0.02]). Also, downward comparisons made children feel more progressed than did upward comparisons ($p < .001$, 95% CI for the mean difference [−0.67, −0.37]). There was no interaction, $F(1, 560) = 0.04$, $p = .837$, $\eta_p^2 < .01$.

Insight. There was no main effect of comparison type or comparison direction, $F(1, 572) = 0.65$, $p = .422$, $\eta_p^2 < .01$, $F(1, 572) = 1.29$, $p = .257$, $\eta_p^2 < .01$, respectively, but there was an interaction, $F(1, 572) = 5.13$, $p = .024$, $\eta_p^2 < .01$. Upward temporal comparison ($M = 2.33$, $SE = 0.28$) and upward social comparison ($M = 2.73$, $SE = 0.28$) writing exercises did not differ in number of insight words ($p = .301$, 95% CI for the mean difference [−1.18, 0.37]). However, partly as hypothesized, writing exercises of downward temporal comparison ($M = 2.64$, $SE = 0.28$) contained more insight words than did those of downward social comparison ($M = 1.79$, $SE = 0.28$, $p = .031$, 95% CI for the mean difference [−1.63, −0.08]).

We repeated these analyses without the six outliers on insight. There was no main effect of comparison type or direction, $F(1, 566) = 1.35$, $p = .246$, $\eta_p^2 < .01$, $F(1, 566) = 2.33$, $p = .128$, $\eta_p^2 < .01$, respectively, but there was a marginally significant interaction, $F(1, 566) = 2.76$, $p = .097$, $\eta_p^2 < .01$. Although the interaction itself was no longer significant, the pattern of findings remained: Upward temporal comparison ($M = 2.33$, $SE = 0.24$) and upward social comparison ($M = 2.45$, $SE = 0.24$) writing exercises did not differ in number of insight words ($p = .722$, 95% CI for the mean difference [−0.77, 0.54]). Relative to writing exercises of downward social comparison ($M = 1.69$, $SE = 0.24$), however, writing exercises of downward temporal comparison ($M = 2.36$, $SE = 0.24$) contained more insight words ($p = .047$, 95% CI for the mean difference [−1.33, −0.01]).

Developmental Trend Effects

We asked whether the effects of comparisons depended on children's age. To find out, we tested if age group interacted with comparison type or comparison direction in predicting outcomes. We excluded data from one 17-year-old and one 18-year-old, because they fell outside of middle adolescence (i.e., our oldest age group). The results of 3 (comparison type: social, temporal,

none) × 3 (comparison direction: downward, upward, none) × 3 (age group: middle-to-late childhood, early adolescence, middle adolescence) between-subjects ANOVAs on each outcome variable yielded no interaction effects involving age group ($ps > .093$; see the online supplemental material for a full description of these results). To examine the robustness of these findings, we repeated these analyses with age and grade level as continuous moderators. Neither of these analyses revealed interaction effects involving age or grade level ($ps > .066$). Thus, there were no robust differences across middle-to-late childhood, early adolescence, and middle adolescence in responses to social and temporal comparisons.

Gender Effects

We asked whether the effects of comparisons depended on children's gender. To find out, we tested if gender interacted with comparison type or comparison direction in predicting outcomes. The results of 3 (comparison type: social, temporal, none) × 3 (comparison direction: downward, upward, none) × 2 (gender: boy, girl) between-subjects ANOVAs on each outcome variable yielded only two interaction effects involving gender: a Comparison Direction × Gender interaction for shame, $F(1, 551) = 4.99$, $p = .026$, $\eta_p^2 = .01$, and a Comparison Type × Direction × Gender interaction for insight (only when the six univariate outliers for insight were retained), $F(1, 560) = 4.73$, $p = .030$, $\eta_p^2 = .01$. Relative to the control condition, downward comparisons reduced shame more strongly in girls than in boys. Writing exercises of downward temporal comparison contained more insight words than those of downward social comparisons, especially in boys.

Discussion

Western societies offer children frequent opportunities for downward social comparison in attempts to make them feel proud. Does downward social comparison inadvertently entice children toward a desire for superiority over others, as cultural commentators have indicated? Our study shows that it does. Downward temporal comparison, on the other hand, makes children feel proud while giving them a sense of progress and insight and steering them toward improvement goals over superiority goals.

Theoretical Implications

The findings have implications for theories of social and temporal comparisons. To date, research and theory have mainly focused on social comparisons, and have primarily addressed when and why people engage in such comparisons (Albert, 1977; Festinger, 1954). They have rarely examined the affective or motivational consequences of comparisons. Our study extends current knowledge by providing causal evidence for the novel theoretical postulate that downward temporal comparison can be a healthy alternative to downward social comparison, as it makes children feel proud and gives them a sense of progress and insight, without triggering a desire for superiority over others.

In our study, downward comparisons raised children's pride and upward comparisons raised children's shame, regardless of whether those comparisons were social or temporal. What psychological processes may underlie these effects? From the perspective of previous work documenting different facets of pride (Tracy & Robins, 2007; Weidman & Tracy, 2013), downward social comparisons might make children feel proud of their achievements by giving them a sense of superior competence (similar to hubristic pride), whereas downward temporal comparisons might make children feel proud of their achievements by giving them a sense of growth in competence (similar to authentic pride). Likewise, social and temporal comparisons may elicit different facets of shame, one stemming from a sense of inferior competence relative to others and the other stemming from not measuring up to one's potential.

Consistent with the social comparison model of competition (Garcia et al., 2013), our findings suggest that social comparisons may contribute to a competitive interpersonal orientation in children. Goal theories (Ames, 1992; Nicholls, 1984) indicate that contexts which foster such a competitive interpersonal orientation elicit ego-involvement rather than task-involvement (i.e., they make children concerned about outperforming others rather than about mastering the task at hand). Unlike social comparisons, temporal comparisons might elicit task-involvement rather than ego-involvement, and by so doing give children an opportunity to reflect on how much effort they put into the tasks they value. Such perceived effort makes children feel that they have grown in competence and achievement (Jagacinski & Nicholls, 1987), which concurs with our finding that temporal comparisons make children feel progressed.

Our findings demonstrate that downward temporal comparisons gave children more insight, but upward temporal comparisons did not. Why? Temporal comparisons offer children an eye-opening opportunity for understanding how they have changed over time—for better or for worse (Wilson & Ross, 2001). Downward temporal comparisons might raise children's awareness about the strategies that helped them move successfully toward their desired self (e.g., allocating their effort efficiently) and, consequently, might provide them with a sense of insight. Upward temporal comparisons might signal children that they did not adopt successful strategies and might therefore not trigger a sense of insight.

Our findings help clarify the desires or motives elicited by social and temporal comparisons. Building on literature on self-evaluation motives in adults (Gregg, Hepper, & Sedikides, 2011; Sedikides, 2018; Sedikides & Strube, 1997), our findings indicate that downward social and temporal comparisons both serve as self-enhancement tools (i.e., making children feel better about themselves), but only temporal comparisons do so without triggering superiority (vs. self-improvement) goals. Thus, in contexts where pursuing superiority may come at the cost of self-improvement (e.g., classrooms), downward temporal comparisons may encourage children to prefer self-improvement.

Temporal comparisons did not raise children's absolute levels of improvement goals, but they did raise children's preference for improvement over superiority goals more strongly than social comparisons did. What explains this finding? Children readily agreed that they desired self-improvement (in fact, across all conditions, they scored an average of 3.26 on a scale ranging from 1 to 4). The critical question, however, was whether children still desired self-improvement when faced with an opportunity to demonstrate superiority. Temporal comparisons may protect children's self-improvement goals against such temptations. We found that, compared to social comparisons, temporal comparisons led children to desire improvement more strongly than superiority.

There has been extensive theorizing about children's use of social comparisons (e.g., Butler, 1989, 1995, 1996; Frey & Ruble, 1985). Notably, Ruble et al. (1980) proposed a developmental model of social comparisons, which holds that children proceed from showing an interest in social comparisons toward using those comparisons for the purpose of self-evaluation. Our findings extended this model in three ways. First, our study incorporated temporal comparisons—an understudied type of comparison (e.g., Butler, 1998; Ruble et al., 1994). Second, our study suggested that social and temporal comparisons may have similar consequences for children's self-evaluations (e.g., pride and shame), but diverging effects on children's superiority versus improvement goals, insight, and sense of progress. Third, our study revealed that the effects of social and temporal comparisons on children's pride, shame, superiority versus improvement goals, insight, and sense of progress remain fairly stable across age. This challenges the idea that children may be more strongly affected by social comparisons as they enter and move through adolescence (Keil et al., 1990).

Practical Implications

The evidence on the benefits of temporal comparisons has practical implications. The self-esteem movement has long encouraged parents and teachers to focus on children's specialness: how children stand out favorably from others (Brummelman et al., 2015). Interventions and educational programs often encourage downward social comparison opportunities to help children confirm their superiority (Dweck, 2006; Kohn, 1992). Such activities may inadvertently direct children to a chronic orientation of confirming their superiority over others rather than improving themselves. Thus, children may sacrifice learning opportunities for the sake of appearing superior.

Over the last few years, there has been a trend toward participation trophies (Merryman, 2013). The thinking is that such trophies will make children feel good about themselves while eliminating a critical source of social comparison (i.e., all children receive the same award). However, such trophies may not abolish social comparisons altogether: Even though all children receive the same award, they may perceive pronounced individual differences in competence and performance. Indeed, given that high-performing children receive the same award as low-performing ones, the former group may feel treated unjustly and look down on

the latter group in contempt. Moreover, when low-performing children are lavished with such unwarranted awards, they may come to believe that they are entitled to recognition, admiration, and respect from others (Alsop, 2008; Merryman, 2013). This claim is buttressed by empirical findings indicating that inflated praise of children predicts higher narcissism, but lower self-esteem, over time (Brummelman, Nelemans, Thomaes, & Orobio de Castro, 2017). When children are reinforced by such extrinsic rewards, those with high sensitivity to rewards may become "addicted" to them, which may underlie narcissistic traits (Thomaes & Brummelman, 2016) and the preference for extrinsic rewards over intrinsic ones (e.g., superiority over self-improvement; Abeyta, Routledge, & Sedikides, 2017). Unlike participation trophies, temporal comparisons may prevent children from looking down on others by shifting their attention away from outperforming others to improving themselves.

Our results point to downward temporal comparisons as a healthy alternative to social comparisons. This begs the question: How could parents and teachers encourage children to engage in temporal comparisons? First, parents and teachers may consider offering children feedback that is focused on temporal rather than social comparison (e.g., "You've performed better than last time!" instead of "You've performed better than your classmates!"). Preliminary evidence suggests that such feedback can galvanize children's intrinsic motivation (Corpus et al., 2006). Second, adults could discuss with children how the latter have changed over time; such conversations can make temporal comparison information more salient for children and invigorate them to evaluate themselves using temporal comparisons. Third, adults could help children reflect on how they overcame challenges or setbacks, which highlights improvement over time. Evidence shows, for example, that parents who convey to their children that failures are an opportunity for learning can instill a growth mindset in them (Haimovitz & Dweck, 2016).

Strengths, Limitations, and Future Research Directions

Our study used a highly powered and rigorous experimental design with novel methods (e.g., analyzing children's writings) in a large sample of difficult-to-recruit participants. These methodological strengths allowed us to make two key contributions to existing literature. First, our study has pioneered the generation and testing of a hypothesis, which was whether an understudied type of comparison, namely temporal comparison, has similar affective consequences as social comparisons, without triggering a desire for superiority and while giving additional benefits such as a sense of progress and insight. Second, our study is novel with its focus on the consequences of social and temporal comparisons in children and adolescents. Previous studies have mainly examined when and why children and young adolescents become interested in and use social-comparison information, and the goal settings that make children and adolescents seek for social comparison versus mastery information (e.g., Butler, 1999). Extending the scarce literature on the consequences of social and temporal comparisons in younger children (ages 4 through 8 in Butler, 1998 and ages 6 through 10 in Ruble et al., 1994), our study was able to examine developmental differences in those consequences.

Our study has limitations and addressing them yields new research directions. First, our study was conducted in the Netherlands, a Western country. Unlike Western children, non-Western children, such as Chinese children, may perceive competition as a key ingredient for self-improvement (Watkins, 2007). Thus, social comparison may be more likely to trigger improvement goals in non-Western children. Second, we focused exclusively on the immediate affective and motivational consequences of comparisons. It would be interesting to examine how frequently children engage in these comparisons in daily life, and how doing so affects their self-feelings and goal pursuit over extended temporal periods. Third, the experimental instructions in the social and temporal comparison conditions were parallel in all but one respect. Prior studies in adults used more parallel wording, inviting people to "compare your present self with your past standing" and to "compare yourself with other people" (Wilson & Ross, 2000, p. 930). However, because this wording was demanding for younger children in our sample, we used simpler wording, asking children to reflect on "a time when you were better/worse than others" (social comparison) and "a time when you got better/worse" (temporal comparison). This wording is consistent with existing work on similar age groups (Butler, 2000; Ruble et al., 1994). Future investigations should examine whether highlighting trajectories makes temporal comparisons more consequential for children. Finally, we did not include a condition that represents a mix of social and temporal comparisons (e.g., "a time when you got better at something than your peers"), as the aim of our research was to isolate the causal effects of social versus temporal comparisons. Such mixed comparisons may have different consequences for people with a fixed versus growth mindset (Butler, 2000).

Conclusion

Western societies offer downward social comparison opportunities. However well-intentioned these opportunities may be, they are likely to trigger a desire in children to be superior to others. We demonstrated that downward temporal comparison—comparing one's present self with one's past self, rather than with others—makes children feel proud, and gives them a sense of progress and insight, without triggering a desire for superiority.

Context of the Research

Western societies have become increasingly concerned about raising healthy self-views in children. Our research examines the origins of those self-views: How do children use social information (e.g., feedback they receive from others) to construct and maintain their self-views? How can this process be redirected to help children flourish? We focused on children's social and temporal comparisons, because such comparisons provide a critical route through which children acquire self-knowledge. The topic has rarely been studied, especially not at an age period where children begin to use such comparisons to evaluate themselves. Using a randomized experiment, we found the temporal comparisons, unlike social comparisons, can make children feel proud and give them a sense of insight and progress, without triggering a desire for superiority. Our findings could inform intervention efforts to help children gain healthy self-views.

References

Abeyta, A. A., Routledge, C., & Sedikides, C. (2017). Material meaning: Narcissists gain existential benefit from extrinsic goals. *Social Psychological & Personality Science, 8,* 219–228. http://dx.doi.org/10.1177/1948550616667618

Albert, S. (1977). Temporal comparison theory. *Psychological Review, 84,* 485–503. http://dx.doi.org/10.1037/0033-295X.84.6.485

Alsop, R. (2008). *The trophy kids grow up: How the millennial generation is shaking up the workplace*. San Francisco, CA: Jossey-Bass.

Ames, C. (1992). Achievement goals and the classroom motivational climate. In D. H. Schunk & J. L. Meece (Eds.), *Student perceptions in the classroom* (pp. 327–348). Hillsdale, NJ: Lawrence Erlbaum. http://dx.doi.org/10.4324/9780203052532

Ames, C., & Archer, J. (1988). Achievement goals in the classroom: Students' learning strategies and motivation processes. *Journal of Educational Psychology, 80,* 260–267. http://dx.doi.org/10.1037/0022-0663.80.3.260

Blackwell, L. S., Trzesniewski, K. H., & Dweck, C. S. (2007). Implicit theories of intelligence predict achievement across an adolescent transition: A longitudinal study and an intervention. *Child Development, 78,* 246–263. http://dx.doi.org/10.1111/j.1467-8624.2007.00995.x

Brummelman, E., Nelemans, S. A., Thomaes, S., & Orobio de Castro, B. (2017). When parents' praise inflates, children's self-esteem deflates. *Child Development, 88,* 1799–1809. http://dx.doi.org/10.1111/cdev.12936

Brummelman, E., Thomaes, S., Nelemans, S. A., Orobio de Castro, B., Overbeek, G., & Bushman, B. J. (2015). Origins of narcissism in children. *Proceedings of the National Academy of Sciences of the United States of America, 112,* 3659–3662. http://dx.doi.org/10.1073/pnas.1420870112

Brummelman, E., Thomaes, S., & Sedikides, C. (2016). Separating narcissism from self-esteem. *Current Directions in Psychological Science, 25,* 8–13. http://dx.doi.org/10.1177/0963721415619737

Buechner, V. L., Pekrun, R., & Lichtenfeld, S. (2018). The Achievement Pride Scales (APS). *European Journal of Psychological Assessment, 34,* 181–192. http://dx.doi.org/10.1027/1015-5759/a000325

Butler, R. (1987). Task-involving and ego-involving properties of evaluation: Effects of different feedback conditions on motivational perceptions, interest, and performance. *Journal of Educational Psychology, 79,* 474–482. http://dx.doi.org/10.1037/0022-0663.79.4.474

Butler, R. (1989). Mastery versus ability appraisal: A developmental study of children's observations of peers' work. *Child Development, 60,* 1350–1361. http://dx.doi.org/10.2307/1130926

Butler, R. (1995). Motivational and informational functions and consequences of children's attention to peers' work. *Journal of Educational Psychology, 87,* 347–360. http://dx.doi.org/10.1037/0022-0663.87.3.347

Butler, R. (1996). Effects of age and achievement goals on children's motives for attending to peers' work. *British Journal of Developmental Psychology, 14,* 1–18. http://dx.doi.org/10.1111/j.2044-835X.1996.tb00690.x

Butler, R. (1998). Age trends in the use of social and temporal comparison for self-evaluation: Examination of a novel developmental hypothesis. *Child Development, 69,* 1054–1073. http://dx.doi.org/10.1111/j.1467-8624.1998.tb06160.x

Butler, R. (1999). Information seeking and achievement motivation in middle childhood and adolescence: The role of conceptions of ability. *Developmental Psychology, 35,* 146–163. http://dx.doi.org/10.1037/0012-1649.35.1.146

Butler, R. (2000). Making judgments about ability: The role of implicit theories of ability in moderating inferences from temporal and social comparison information. *Journal of Personality and Social Psychology, 78,* 965–978. http://dx.doi.org/10.1037/0022-3514.78.5.965

Buunk, B. P., Kuyper, H., & van der Zee, Y. G. (2005). Affective response to social comparison in the classroom. *Basic and Applied Social Psychology, 27,* 229–237. http://dx.doi.org/10.1207/s15324834basp2703_4

Carver, C. S., & Scheier, M. F. (1981). *Attention and self-regulation: A control theory approach to human behavior*. New York, NY: Springer-Verlag. http://dx.doi.org/10.1007/978-1-4612-5887-2

Cash, T. F., Cash, D. W., & Butters, J. W. (1983). "Mirror, mirror, on the wall . . .?": Contrast effects and self-evaluations of physical attractiveness. *Personality and Social Psychology Bulletin, 9,* 351–358. http://dx.doi.org/10.1177/0146167283093004

Chartrand, T. L., Ruble, D. N., & Trope, Y. (2001). Changes in task orientation and self-evaluation across phases of a transition. In A. Efklides, J. Kuhl, & R. M. Sorrentino (Eds.), *Trends and prospects in motivation research* (pp. 221–237). Dordrecht, the Netherlands: Kluwer Academic Publishers. http://dx.doi.org/10.1007/0-306-47676-2

Cimpian, A. (2017). Early reasoning about competence is not irrationally optimistic, nor does it stem from inadequate cognitive representations. In A. J. Elliot, C. S. Dweck, & D. S. Yeager (Eds.), *Handbook of competence and motivation: Theory and application* (2nd ed., pp. 387–407). New York, NY: Guilford Press.

Clark, M. (2017). *5 keys to raising a happy child*. Retrieved from http://www.uhhospitals.org/myuhcare/health-and-wellness/better-living-health-articles/2017/may/5-keys-to-raising-a-happy-child

Collins, R. L. (1996). For better or worse: The impact of upward social comparison on self-evaluations. *Psychological Bulletin, 119,* 51–69. http://dx.doi.org/10.1037/0033-2909.119.1.51

Corpus, J. H., Ogle, C. M., & Love-Geiger, K. E. (2006). The effects of social-comparison versus mastery praise on children's intrinsic motivation. *Motivation and Emotion, 30,* 335–345. http://dx.doi.org/10.1007/s11031-006-9039-4

Covington, M. V. (1992). *Making the grade: A self-worth perspective on motivation and school reform*. New York, NY: Cambridge University Press. http://dx.doi.org/10.1017/CBO9781139173582

Csermely, P. (2003). Recruiting the younger generation to science. *EMBO Reports, 4,* 825–828. http://dx.doi.org/10.1038/sj.embor.embor927

Dijkstra, P., Kuyper, H., van der Werf, G., Buunk, A. P., & van der Zee, Y. G. (2008). Social comparison in the classroom: A review. *Review of Educational Research, 78,* 828–879. http://dx.doi.org/10.3102/0034654308321210

Dweck, C. S. (2002). The development of ability conceptions. In A. Wigfield & J. S. Eccles (Eds.), *Development of achievement motivation* (pp. 57–88). London, UK: Academic Press. http://dx.doi.org/10.1016/B978-012750053-9/50005-X

Dweck, C. S. (2006). *Mindset: The new psychology of success*. New York, NY: Random House.

Dweck, C. S., & Leggett, E. L. (1988). A social-cognitive approach to motivation and personality. *Psychological Review, 95,* 256–273. http://dx.doi.org/10.1037/0033-295X.95.2.256

Dweck, C. S., & Molden, D. C. (2017). Mindsets. Their impact on competence motivation and acquisition. In A. J. Elliot, C. S. Dweck, & D. S. Yeager (Eds.), *Handbook of competence and motivation: Theory and application* (2nd ed., pp. 135–154). New York, NY: Guilford Press.

Eccles, J., Wigfeld, A., Midgley, C., Reuman, D., Mac Iver, D., & Feldlaufer, H. (1993). Negative effects of traditional middle schools on students' motivation. *The Elementary School Journal, 93,* 553–574. http://dx.doi.org/10.1086/461740

Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39,* 175–191. http://dx.doi.org/10.3758/BF03193146

Festinger, L. (1954). A theory of social comparison processes. *Human Relations, 7,* 117–140. http://dx.doi.org/10.1177/001872675400700202

Fivush, R. (2001). Owning experience: Developing subjective perspective in autobiographical narratives. In C. Moore & K. Lemmon (Eds.), *Self in time: Developmental perspectives* (pp. 35–52). Mahwah, NJ: Lawrence Erlbaum. http://dx.doi.org/10.4324/9781410600684

Fivush, R., & Schwarzmueller, A. (1998). Children remember childhood: Implications for childhood amnesia. *Applied Cognitive Psychology, 12,* 455–473. http://dx.doi.org/10.1002/(SICI)1099-0720(199810)12:5<455::AID-ACP534>3.0.CO;2-H

Frattaroli, J., Thomas, M., & Lyubomirsky, S. (2011). Opening up in the classroom: Effects of expressive writing on graduate school entrance exam performance. *Emotion, 11,* 691–696. http://dx.doi.org/10.1037/a0022946

Frey, K. S., & Ruble, D. N. (1985). What children say when the teacher is not around: Conflicting goals in social comparison and performance assessment in the classroom. *Journal of Personality and Social Psychology, 48,* 550–562. http://dx.doi.org/10.1037/0022-3514.48.3.550

Frey, K. S., & Ruble, D. N. (1990). Strategies for comparative evaluation: Maintaining a sense of competence across the life span. In R. J. Sternberg & J. Kolligian, Jr., (Eds.), *Competence considered* (pp. 167–189). New Haven, CT: Yale University Press.

Garcia, D. J., Janis, R., & Flom, R. (2015). Children's recognition of pride. *Journal of Experimental Child Psychology, 137,* 85–98. http://dx.doi.org/10.1016/j.jecp.2015.03.010

Garcia, S. M., Tor, A., & Schiff, T. M. (2013). The psychology of competition: A social comparison perspective. *Perspectives on Psychological Science, 8,* 634–650. http://dx.doi.org/10.1177/1745691613504114

Gilbert, P. (2000). The relationship of shame, social anxiety and depression: The role of the evaluation of social rank. *Clinical Psychology & Psychotherapy, 7,* 174–189. http://dx.doi.org/10.1002/1099-0879(200007)7:3<174::AID-CPP236>3.0.CO;2-U

Goolsby, L. L., & Chaplin, W. F. (1988). The impact of normative, ipsative, and idiothetic information on feelings about academic performance. *Journal of Research in Personality, 22,* 445–464. http://dx.doi.org/10.1016/0092-6566(88)90003-7

Gregg, A. P., Hepper, E. G., & Sedikides, C. (2011). Quantifying self-motives: Functional links between dispositional desires. *European Journal of Social Psychology, 41,* 840–852. http://dx.doi.org/10.1002/ejsp.827

Haferkamp, N., & Krämer, N. C. (2011). Social comparison 2.0: Examining the effects of online profiles on social-networking sites. *Cyberpsychology, Behavior, and Social Networking, 14,* 309–314. http://dx.doi.org/10.1089/cyber.2010.0120

Haimovitz, K., & Dweck, C. S. (2016). Parents' views of failure predict children's fixed and growth intelligence mind-sets. *Psychological Science, 27,* 859–869. http://dx.doi.org/10.1177/0956797616639727

Harter, S. (2012). *Construction of the self: Developmental and sociocultural foundations.* New York, NY: Guilford Press.

Higgins, E. T. (1987). Self-discrepancy: A theory relating self and affect. *Psychological Review, 94,* 319–340. http://dx.doi.org/10.1037/0033-295X.94.3.319

Hoffman, P. J., Festinger, L., & Lawrence, D. H. (1954). Tendencies toward group comparability in competitive bargaining. *Human Relations, 7,* 141–159. http://dx.doi.org/10.1177/001872675400700203

Jagacinski, C. M., & Nicholls, J. G. (1987). Competence and affect in task involvement and ego involvement: The impact of social comparison information. *Journal of Educational Psychology, 79,* 107–114. http://dx.doi.org/10.1037/0022-0663.79.2.107

Kamins, M. L., & Dweck, C. S. (1999). Person versus process praise and criticism: Implications for contingent self-worth and coping. *Developmental Psychology, 35,* 835–847. http://dx.doi.org/10.1037/0012-1649.35.3.835

Keil, L. J., McClintock, C. G., Kramer, R., & Platow, M. J. (1990). Children's use of social comparison standards in judging performance and their effects on self-evaluation. *Contemporary Educational Psychology, 15,* 75–91. http://dx.doi.org/10.1016/0361-476X(90)90007-N

Kohn, A. (1992). *No contest: The case against competition.* Boston, MA: Houghton Mifflin.

Lapan, C., & Boseovski, J. J. (2017). When peer performance matters: Effects of expertise and traits on children's self-evaluations after social comparison. *Child Development, 88,* 1860–1872. http://dx.doi.org/10.1111/cdev.12941

Levine, J. M. (1983). Social comparison and education. In J. M. Levine & M. C. Wang (Eds.), *Teacher and student perception: Implications for learning* (pp. 29–55). Hillsdale, NJ: Lawrence Erlbaum.

Lewis, M. (1992). *Shame: The exposed self.* New York, NY: Free Press.

Markus, H., & Nurius, P. (1986). Possible selves. *American Psychologist, 41,* 954–969. http://dx.doi.org/10.1037/0003-066X.41.9.954

Marschall, D. E., Sanftner, J. L., & Tangney, J. P. (1994). *The State Shame and Guilt Scale (SSGS).* Fairfax, VA: George Mason University.

Meece, J. L., Anderman, E. M., & Anderman, L. H. (2006). Classroom goal structure, student motivation, and academic achievement. *Annual Review of Psychology, 57,* 487–503. http://dx.doi.org/10.1146/annurev.psych.56.091103.070258

Merryman, A. (2013). *Losing is good for you.* Retrieved from http://trinitypreschoolsc.org/wp-content/uploads/Losing-is-Good-for-You.pdf

Midgley, C., Anderman, E., & Hicks, L. (1995). Differences between elementary and middle school teachers and students: A goal theory approach. *The Journal of Early Adolescence, 15,* 90–113. http://dx.doi.org/10.1177/0272431695015001006

Mirgain, S. (2015). *Self-compassion in kids.* Retrieved from https://parenting.uwhealth.org/2015/08/self-compassion-in-kids/?_ga=2.35005927.716643297.1576822287-2031126413.1576822287

Mosatche, H. S., & Bragonier, P. (1981). An observational study of social comparison in preschoolers. *Child Development, 52,* 376–378. http://dx.doi.org/10.2307/1129256

Nicholls, J. G. (1984). Achievement motivation: Conceptions of ability, subjective experience, task choice, and performance. *Psychological Review, 91,* 328–346. http://dx.doi.org/10.1037/0033-295X.91.3.328

Nicholls, J. G., & Miller, A. T. (1983). The differentiation of the concepts of difficulty and ability. *Child Development, 54,* 951–959. http://dx.doi.org/10.2307/1129899

Nieuwenhuis, S., Forstmann, B. U., & Wagenmakers, E. J. (2011). Erroneous analyses of interactions in neuroscience: A problem of significance. *Nature Neuroscience, 14,* 1105–1107. http://dx.doi.org/10.1038/nn.2886

Pemberton, M., & Sedikides, C. (2001). When do individuals help close others improve? The role of information diagnosticity. *Journal of Personality and Social Psychology, 81,* 234–246. http://dx.doi.org/10.1037/0022-3514.81.2.234

Pennebaker, J. W., Booth, R. J., Boyd, R. L., & Francis, M. E. (2015). *Linguistic inquiry and word count.* Retrieved from http://liwc.wpengine.com/

Pennebaker, J. W., & Francis, M. E. (1996). Cognitive, emotional, and language processes in disclosure. *Cognition and Emotion, 10,* 601–626. http://dx.doi.org/10.1080/026999396380079

Pomerantz, E. M., Ruble, D. N., Frey, K. S., & Greulich, F. (1995). Meeting goals and confronting conflict: Children's changing perceptions of social comparison. *Child Development, 66,* 723–738. http://dx.doi.org/10.2307/1131946

Robins, R. W., & Pals, J. L. (2002). Implicit self-theories in the academic domain: Implications for goal orientation, attributions, affect, and self-esteem change. *Self and Identity, 1,* 313–336. http://dx.doi.org/10.1080/15298860290106805

Romero, C., Master, A., Paunesku, D., Dweck, C. S., & Gross, J. J. (2014). Academic and emotional functioning in middle school: The role of implicit theories. *Emotion, 14,* 227–234. http://dx.doi.org/10.1037/a0035490

Ruble, D. N. (1994). A phase model of transitions: Cognitive and motivational consequences. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 26, pp. 163–214). San Diego, CA: Academic Press. http://dx.doi.org/10.1016/S0065-2601(08)60154-9

Ruble, D. N., Boggiano, A. K., Feldman, N. S., & Loebl, J. H. (1980). Developmental analysis of the role of social comparison in self-evaluation. *Developmental Psychology, 16,* 105–115. http://dx.doi.org/10.1037/0012-1649.16.2.105

Ruble, D. N., Eisenberg, R., & Higgins, E. T. (1994). Developmental changes in achievement evaluation: Motivational implications of self-other differences. *Child Development, 65,* 1095–1110. http://dx.doi.org/10.2307/1131307

Ruble, D. N., Feldman, N. S., & Boggiano, A. K. (1976). Social comparison between young children in achievement situations. *Developmental Psychology, 12,* 192–197. http://dx.doi.org/10.1037/0012-1649.12.3.192

Ruble, D. N., & Flett, G. L. (1988). Conflicting goals in self-evaluative information seeking: Developmental and ability level analyses. *Child Development, 59,* 97–106. http://dx.doi.org/10.2307/1130392

Ruble, D. N., & Frey, K. S. (1991). Changing patterns of comparative behavior as skills are acquired: A functional model of self-evaluation. In J. Suls & T. A. Wills (Eds.), *Social comparison: Contemporary theory and research* (pp. 79–113). Hillsdale, NJ: Lawrence Erlbaum.

Ruble, D. N., Grosovsky, E. H., Frey, K. S., & Cohen, R. (1992). Developmental changes in competence assessment. In A. K. Boggiano & T. S. Pittman (Eds.), *Cambridge studies in social and emotional development. Achievement and motivation: A social-developmental perspective* (pp. 138–164). New York, NY: Cambridge University Press.

Ruble, D. N., Parsons, J. E., & Ross, J. (1976). Self-evaluative responses of children in an achievement setting. *Child Development, 47,* 990–997. http://dx.doi.org/10.2307/1128435

Ryff, C. D. (1991). Possible selves in adulthood and old age: A tale of shifting horizons. *Psychology and Aging, 6,* 286–295. http://dx.doi.org/10.1037/0882-7974.6.2.286

Schmider, E., Ziegler, M., Danay, E., Beyer, L., & Bühner, M. (2010). Is it really robust? Reinvestigating the robustness of ANOVA against violations of the normal distribution assumption. *Methodology: European Journal of Research Methods for the Behavioral and Social Sciences, 6,* 147–151. http://dx.doi.org/10.1027/1614-2241/a000016

Sedikides, C. (2015). *State Self-Improvement Scale*. Unpublished scale, University of Southampton, United Kingdom.

Sedikides, C. (2018). The need for positive feedback: Sociocultural consideration of self-evaluative motives in education. In G. A. D. Liem & D. M. McInerney (Eds.), *Big theories revisited* 2 (pp. 381–400). Charlotte, NC: Information Age Press.

Sedikides, C., & Gregg, A. P. (2008). Self-enhancement: Food for thought. *Perspectives on Psychological Science, 3,* 102–116. http://dx.doi.org/10.1111/j.1745-6916.2008.00068.x

Sedikides, C., & Hepper, E. G. D. (2009). Self-improvement. *Social and Personality Psychology Compass, 3,* 899–917. http://dx.doi.org/10.1111/j.1751-9004.2009.00231.x

Sedikides, C., & Strube, M. J. (1997). Self-evaluation: To thine own self be good, to thine own self be sure, to thine own self be true, and to thine own self be better. *Advances in Experimental Social Psychology, 29,* 209–269. http://dx.doi.org/10.1016/S0065-2601(08)60018-0

Seidner, L. B., Stipek, D. J., & Feshbach, N. D. (1988). A developmental analysis of elementary school-aged children's concepts of pride and embarrassment. *Child Development, 59,* 367–377. http://dx.doi.org/10.2307/1130316

Smith, R. H. (2000). Assimilative and contrastive emotional reactions to upward and downward social comparisons. In J. Suls & L. Wheeler (Eds.), *Handbook of social comparison: Theory and research* (pp. 173–200). New York, NY: Kluwer/Plenum Press. http://dx.doi.org/10.1007/978-1-4615-4237-7_10

Suls, J., & Mullen, B. (1982). From the cradle to the grave: Comparison and self-evaluation across the life-span. In J. Suls (Ed.), *Psychological perspectives on the self* (Vol. 1, pp. 97–125), Hillsdale, NJ: Lawrence Erlbaum.

Tabachnick, B. G., & Fidell, L. S. (2014). *Using multivariate statistics* (6th ed.). Boston, MA: Pearson Education.

Tesser, A. (1988). Toward a self-evaluation maintenance model of social behavior. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 21, pp. 181–227). San Diego, CA: Academic Press. http://dx.doi.org/10.1016/S0065-2601(08)60227-0

Thomaes, S., & Brummelman, E. (2016). Narcissism. In D. Cicchetti (Ed.), *Developmental psychopathology* (3rd ed., Vol. 4, pp. 679–725). Hoboken, NJ: Wiley. http://dx.doi.org/10.1002/9781119125556.devpsy316

Thomaes, S., Reijntjes, A., Orobio de Castro, B., Bushman, B. J., Poorthuis, A., & Telch, M. J. (2010). I like me if you like me: On the interpersonal modulation and regulation of preadolescents' state self-esteem. *Child Development, 81,* 811–825. http://dx.doi.org/10.1111/j.1467-8624.2010.01435.x

Tracy, J. L., & Robins, R. W. (2004). Putting the self into self-conscious emotions: A theoretical model. *Psychological Inquiry, 15,* 103–125. http://dx.doi.org/10.1207/s15327965pli1502_01

Tracy, J. L., & Robins, R. W. (2007). The psychological structure of pride: A tale of two facets. *Journal of Personality and Social Psychology, 92,* 506–525. http://dx.doi.org/10.1037/0022-3514.92.3.506

Twenge, J. M. (2006). *Generation me: Why today's young Americans are more confident, assertive, entitled—And more miserable than ever before*. New York, NY: Free Press.

Van Abbema, D. L., & Bauer, P. J. (2005). Autobiographical memory in middle childhood: Recollections of the recent and distant past. *Memory, 13,* 829–845. http://dx.doi.org/10.1080/09658210444000430

Van Der Aar, L. P. E., Peters, S., & Crone, E. A. (2018). The development of self-views across adolescence: Investigating self-descriptions with and without social comparison using a novel experimental paradigm. *Cognitive Development, 4,* 256–270. http://dx.doi.org/10.1016/j.cogdev.2018.10.001

Venables, W. N. (2000). *Exegeses on linear models*. Retrieved from https://www.stats.ox.ac.uk/pub/MASS3/Exegeses.pdf

Veroff, J. (1969). Social comparison and the development of achievement motivation in children. In C. P. Smith (Ed.), *Achievement-related motives in children* (pp. 46–101). New York, NY: Russell Sage Foundation.

Watkins, D. (2007). The nature of competition: The views of students from three regions of the People's Republic of China. In F. Salili & R. Hoosain (Eds.), *Culture, motivation, and learning: A multicultural perspective* (pp. 217–233). Charlotte, NC: Information Age Publishing.

Wedell, D. H., & Parducci, A. (2000). Social comparison: Lessons from basic research on judgment. In J. Suls & L. Wheeler (Eds.), *Handbook of social comparison: Theory and research. The Plenum Press series in social/clinical psychology* (pp. 223–252). Dordrecht, the Netherlands: Kluwer Academic Publishers. http://dx.doi.org/10.1007/978-1-4615-4237-7_12

Weidman, A. C., & Tracy, J. L. (2013). Saleem, Shiva, and status: Authentic and hubristic pride personified in Midnight's Children. *Interdisciplinary Humanities, 30,* 5–29. Retrieved from http://ubc-emotionlab.ca/wp-content/files_mf/weidmantracy2013authenticandhubristicprideinmidnightschildren.pdf

Weiner, B. (2005). Motivation from an attribution perspective and the social psychology of perceived competence. In A. J. Elliot & C. S. Dweck (Eds.), *Handbook of competence and motivation* (pp. 73–84). New York, NY: Guilford Press.

Wills, T. A. (1981). Downward comparison principles in social psychology. *Psychological Bulletin, 90,* 245–271. http://dx.doi.org/10.1037/0033-2909.90.2.245

Wilson, A. E., & Ross, M. (2000). The frequency of temporal-self and social comparisons in people's personal appraisals. *Journal of Personality and Social Psychology, 78,* 928–942. http://dx.doi.org/10.1037/0022-3514.78.5.928

Wilson, A. E., & Ross, M. (2001). From chump to champ: People's appraisals of their earlier and present selves. *Journal of Personality and Social Psychology, 80,* 572–584. http://dx.doi.org/10.1037/0022-3514.80.4.572

Yeager, D. S., Lee, H. Y., & Jamieson, J. P. (2016). How to improve adolescent stress responses: Insights from integrating implicit theories of personality and biopsychosocial models. *Psychological Science, 27,* 1078–1091. http://dx.doi.org/10.1177/0956797616649604

Young-Eisendrath, P. (2008). *The self-esteem trap: Raising confident and compassionate kids in an age of self-importance.* New York, NY: Little, Brown.

Zell, E., & Alicke, M. D. (2009). Self-evaluative effects of temporal and social comparison. *Journal of Experimental Social Psychology, 45,* 223–227. http://dx.doi.org/10.1016/j.jesp.2008.09.007

Zell, E., & Krizan, Z. (2014). Do people have insight into their abilities? A metasynthesis. *Perspectives on Psychological Science, 9,* 111–125. http://dx.doi.org/10.1177/1745691613518075