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DISSERTATION / DOCTORAL THESIS

Titel der Dissertation / Title of the Doctoral Thesis

„The Role of Gender Self-stereotyping in Adolescents'
Psychological Functioning“

verfasst von / submitted by

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angestrebter akademischer Grad / in partial fulfilment of the requirements for the degree of

Doktorin der Philosophie (Dr.phil.)

Wien, 2021 / Vienna, 2021

Studienkennzahl lt. Studienblatt /

UA 796 310 298

Degree programme code as it appears
on the student record sheet:

Dissertationsgebiet lt. Studienblatt /
Field of study as it appears on the
student record sheet:

Psychologie

Betreut von / Supervisor:

Univ.-Prof. Dr. Dr. Christiane Spiel

I would like to dedicate this work to my family who has continued to be supportive and encouraging through this journey.

To Esma & Fikret, my parents, who have given me the love and support I needed to accomplish what I have, and become the woman I am today.

To Armin, my husband, who has been there every step of the way – for tremendous love and great brainstorming discussions.

To Neno & Dženo – my brothers and my best friends.

Acknowledgements

I would like to express my very great appreciation and gratitude to my supervisor Prof. Dr. Dr. Christiane Spiel for constant support and substantial inputs during the dissertation process. I would like to especially thank Dr. Marlene Kollmayer, my friend and co-mentor, for all the guidance and encouragement throughout my dissertation journey. I also want to thank all my colleagues and co-authors for their valuable contribution and great time we had together.

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List of publications

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Korlat, S., Schultes, M.-T., Schober, B., Spiel, C., & Kollmayer, M. (submitted). Adolescents' Gender Role Identity and Occupational Aspirations: Gender Typicality, Prestige and Leadership Desire. *Psychology of Women Quarterly*.

Korlat, S., Julia, H., Schultes, M.-T., Bürger, S., Schober, B., Spiel, C., & Kollmayer, M. (under review). Psychological Androgyny in School: Associations Between Adolescents' Gender Role Self-Concept and School-Related Well-Being. *School Mental Health*.

Korlat, S., Kollmayer, M., Holzer, J., Lüftenegger, M., Pelikan, E., Schober, B., & Spiel, C. (2021). Gender Differences in Digital Learning During COVID-19: Competence Beliefs, Intrinsic Value, Learning Engagement, and Perceived Teacher Support. *Frontiers in Psychology*, 12: 637776, 1-12. <https://doi.org/10.3389/fpsyg.2021.637776>

1. Theoretical background

1.1. Social categorization and the origins of stereotypes

Social categorization is the process by which people organize the world around them, allowing them to simplify what they observe and to predict other people's behavior (Fiske & Taylor, 2013). In order to do so, people categorize others into different groups based on personal characteristics (such as race, age, gender, etc.) and generalize assumed group features to individuals belonging to that group. This process is known as *stereotyping* (e.g., Allport, 1954; Rosenthal & Overstreet, 2016). Similar to categories and schemas, stereotypes are a form of automatic thinking that helps us to save our daily cognitive effort (Brown, 1995). However, despite their adaptive function, stereotypes can have detrimental consequences by making us blind to individual differences among people belonging to the same group. For instance, stereotypes can affect expectations about performance, bias consequent decisions that affect work and education opportunities and outcomes, or serve to justify a negative affective reaction toward others (Steele & Aronson, 1995). Moreover, when stereotypes are strong enough, they can create self-defeating beliefs about own abilities and interests (Aronson et al., 2005). Indeed, individuals categorize and stereotype not only others, but also themselves. According to social identity theory (Tajfel & Turner, 1979) and self-categorization theory (Turner et al., 1987), group membership is internalized as a relevant aspect of the self-concept when one identifies with a certain social category. Thus, a portion of an individual's self-concept is derived from perceived membership in a relevant social group, shaping one's social identity (Turner & Oakes, 1986). The ascription of in-group stereotypical characteristics to the self is defined as *self-stereotyping* (Hogg & Turner, 1987; Guimond et al., 2006; Pickett et al., 2002). Research suggests that self-stereotyping also has an adaptive function for social-identity formation (Sinclair et al., 2006), and far reaching consequences on everyday functioning, including self-evaluation (e.g., Latrofa et al., 2010), well-being and self-esteem (e.g., Cohen & Garcia, 2005; Latrofa et al., 2009), and education and career options (e.g., Ambady et al., 2001; Ertl et al., 2017). As individuals are members of many social groups simultaneously, one's self-concept and self-evaluation are mostly influenced by their most salient social group membership (Sinclair et al., 2006; Turner et al., 1987).

1.2. Gender stereotypes and development of gendered self

Gender is one of the most salient social categories (Damon et al., 2008) and represents a stable way of classifying self and others (Powlishta, 2004). Already in the first years of life, children learn that the world is divided into gender groups – it is the first social category of which children become aware and one that soon starts to be a pivotal factor in their life (Halim et al., 2016, 2018). Studies have shown that children between 18 and 24 months recognize gender labels associated with faces, show gender-typed visual preferences for toys and stereotype knowledge (Eichstedt et al., 2002; Serbin et al., 2001). Studies using tacit preverbal measures of gender knowledge indicate that children’s realization that they are either a boy or a girl (gender identity), may emerge between age 2 and 3 (cf., Martin et al., 2002). Most children can accurately label their own sex between 27 and 30 months (Halim & Ruble, 2010). Both cognitive-developmental (Kohlberg, 1966) and gender schema theory (Bem, 1981) propose that this self-categorization as a “boy” or a “girl”, is a prerequisite for the development of gender-typed traits and behaviors, the so called “gendered self”¹. With further development, children form organized networks of mental associations representing information about themselves and the genders, which in turn influence their information processing and behavior (Martin et al., 2002). These *gender schemas* serve the same function as any social categorization – to classify and organize information in a complex environment (Bem, 1981; Martin & Halverson, 1981). The cognitive-developmental (Kohlberg, 1966) and gender schema theory (Bem, 1981) further propose that children are motivated to behave in accordance with gender norms and to conform to the stereotypes they learn in order to be good and typical members of their gender group, ultimately benefiting their self-esteem and cognitive consistency. This theorizing aligns with the postulates of self-categorization theory as well (Tajfel & Turner, 1986). Thus, research concludes that, before beginning kindergarten, children have adopted a broad spectrum of gender-related knowledge and gender-typed behaviors, as well as a variety of gender-stereotyped associations (Martinez et al., 2019). These observations led researchers to examine how socialization processes might contribute to this early acquisition of gender-linked traits and behavior (Bandura, 1986).

¹ First theorizing within the cognitive-developmental theory assumed that the recognition that gender identity is not affected by changes in gender-typed appearances, activities, and traits (developmental milestone labeled *gender consistency*) is the most important developmental level of gender understanding for motivating gender role adherence in children. However, newer studies showed lower levels of understanding, such as pure self-categorization as boys and girls as sufficient for that (for detailed discussion see Martin et al., 2002).

1.2.1. Gender role learning

Although gender-typed traits and behaviors emerge in earliest infancy, they are not innate, but socially constructed concepts. According to the social-cognitive theory (Bussey & Bandura, 1999), children learn about gender in interaction with their environment. Socialization agents (primarily parents, but then also the broader environment) convey which traits and behaviors are acceptable for girls and which for boys, thus shaping children's self-image and self-efficacy (Bussey & Bandura, 1999; Tisak et al., 2012). For example, children quickly learn that “pink is for girls” and “blue is for boys” due to parents’ practices in dressing the children. Thus, a young girl might have liked all kinds of colors at age 2, but by age 4, all of her clothing might be pink (Halim et al., 2014). Parents also provide daughters and sons with different activities and opportunities. For instance, boys’ activities and toys tend to relate to action, aggression and technology, whereas girls’ activities and toys relate to nurturance, attractiveness and beauty (Blakemore & Centers 2005; Kollmayer et al., 2018). Similarly, it has been shown that parents provide boys with more opportunities to do sports and computing, whereas girls are encouraged more to read and to interact with their peers (Eccles et al., 1993). A recent systematic review of gendered parenting in US, Canada, Australia and Western Europe (Morawska, 2020) showed that parents use more emotional expressions with daughters (Fivush et al., 2000), but more power assertion and physical control with sons (Endendijk et al., 2013). Thus, in Western culture, boys are taught through everyday experiences to express independence, self-assertion and dominance, whereas girls learn to be caring, kind and focused on others (Helgeson, 1994; Kollmayer et al., 2018a). Sociocultural factors establish the conditions under which children learn which characteristics men and women typically have and what characteristics they should have (Prentice & Carranza, 2002). These gender roles – culturally coded expectations a society holds towards men and women – constitute gender stereotypes (e.g., Maccoby, 1988; Deaux & LaFrance, 1998; Eagly et al., 2000). As children mature, they adopt gender stereotypes and the cultural meanings of gender into their own psyches (Sczesny et al., 2019).

1.3. The crucial period of adolescence

Although children learn about the social category of gender from earliest infancy, it is during adolescence that they adopt gender stereotypical traits into their self-concept and develop gender typical behaviors (Klaczynski et al., 2020). The gender intensification hypothesis, proposed by Hill and Lynch (1983), states this is happening because girls and boys face increased pressure (from parents, teachers, peers and the media) in this period of life to conform to culturally established gender roles in order to prepare for “adequate” social roles in approaching adulthood. Due to these pressure, alongside with physical changes, adolescents develop more differentiated gender-role identities which presumably will be adaptive for their adult roles as women and men (Priess et al., 2009). In general, this developmental phase is specifically sensitive as it is marked by substantial biological, psychological, and social changes that consequently lead to changes in self-concept and self-representations (Schaffhuser et al., 2017). This transformation falls under the developmental milestone of identity formation (Erikson, 1968), and it inevitably occurs in interaction with the surrounding environment (Côté, 2009). Besides identity development – and alongside it – in this period boys and girls develop the capabilities required to develop and maintain social and emotional habits important for psychological well-being (Pyhälä et al., 2010; WHO, 2020). Another important task in this period is the formation of career- and learning-related aspirations and behaviors, as adolescents become more focused on their future and more goal-oriented (Nurmi, 2004). All these developmental milestones are related to and affected by gender stereotypes and self-stereotyping (Abele, 2014; Bandura et al., 2001; Eccles et al., 2007, 2009; Sczesny et al., 2019). It has been repeatedly shown that differences in the extent to which individuals adopt stereotypically masculine and feminine traits in their self-concept impact psychological adjustment and well-being (Abele, 2014; Fournier and Moskowitz, 2000; Helgeson, 1994; Markstrom-Adams, 1989; Saragovi et al., 2002; Saragovi et al., 1997; Sheldon and Cooper, 2008), academic engagement and achievement (Heyder & Kessels, 2013; Kessels et al., 2014), and occupational aspirations, interests and choices (Eccles, 2007; Diekmann et al., 2011).

1.3.1. Gender self-stereotyping and gender intensification in adolescence

In line with gender stereotypes, stereotypically masculine qualities include *instrumental* traits and behaviors related to goal achievement and task functioning, such as being “determined”, “competent” and “independent”, while stereotypically feminine qualities encompass *expressive* traits and behaviors related to the maintenance of relationships and social functioning, such as being “patient”, “gentle” and “sensitive toward others” (Bem, 1974). Bakan (1966) conceptualizes these two orientations as two fundamental values in human existence and two pillars of human personality: *agency* – a focus on the self as an autonomous agent, and *communion* – a focus on others and social relationships. Thus, agency and communion coincide with societal gender stereotypes (Deaux & LaFrance, 1998; Eagly et al., 2000), with agency related to the masculine stereotype and communion related to the feminine one (Abele & Wojciszke, 2007; Bem, 1974; Eagly, 1987; Spence et al., 1975). While the equating of these terms has been questioned and criticized (e.g., Pedhazur & Tetenbaum, 1979), newer evidence confirms their interchangeability. In a study by Abele and Wojciszke (2007), 300 attributes were evaluated according to the degree to which they expressed competence versus morality, individualism versus collectivism, agency versus communion, and masculinity versus femininity. The results of a principal component analysis yielded a clear two-factorial solution, with agency representing the common core of dimensions like individualism, competence, intellectual functioning, and masculinity, and communion representing the common core of dimensions like collectivism, morality, social functioning, and femininity (Abele & Wojciszke, 2007). Therefore, the concepts of agency and communion can be equated with the concepts of psychological masculinity and femininity on an operational level. Compelling evidence suggests that men are more likely to describe themselves using agentic attributes, whereas women tend to describe themselves using communal terms (e.g., Eagly et al., 2020; Diekmann & Eagly, 2000; Helgeson & Palladino, 2012; Szczesny et al., 2019). Some scholars suggest that this difference in self-concept is the most important and persistent gender difference that exists (Cross & Madson, 1997; Maddux & Brewer, 2005).

The gender intensification hypothesis (Hill & Lynch, 1983) posits that the roots of that differentiation begin in adolescence. Accordingly, studies repeatedly show that, on average, adolescent girls report a more communal self-concept and endorse more communal goals than adolescent boys, whereas boys report a relatively agentic self-concept and pursue more agentic goals than girls (Block et al., 2018; Kłaczynski et al., 2020; Ojanen et al., 2005; Skinner et al.,

2019). However, although gender intensification hypothesis proposes increasingly gender stereotyped self-concepts throughout adolescence, studies investigating the intensification of gender role identities in adolescence have yielded heterogeneous results. While some found evidence for the intensified adoption of stereotypical traits and behaviors in boys' and girls' self-concept throughout adolescence (Boldizar, 1991; Klaczynski et al., 2020), or at least in one group (boys; Galambos et al., 1990), others did not find older adolescents to gender self-stereotype themselves more than younger adolescents (Block et al., 2018; Priess et al., 2009; Wichstrøm, 1999). Newer findings on gender self-stereotyping among adolescents have shown gender differences in agency to vanish (Priess et al., 2009), as nowadays might be more acceptable, and even encouraged, for girls to take on agentic traits and behaviors. Conversely, communal traits and behaviors in boys are still not granted the same social acceptance from peers and parents (Kane, 2006; Priess et al., 2009; Sirin et al., 2004).

1.3.2. Effects of gender self-stereotyping in adolescence

Agency and communion are not only dimensions in person's identity and self-concept, but they can serve as personal standards for behavior (Eagly & Wood, 2012). Empirical studies showed that men and women regulate their own behavior to correspond to gender roles (e.g., Witt & Wood, 2010). A reason for that is that both women and men are rewarded by other people for conforming to gender roles, whereas behavior inconsistent with gender roles leads to social repercussion (Eagly & Wood, 2012; Van Grootel et al., 2018). Thus, many pivotal features in life - including academic, vocational, relational and leisure activities one is expected to pursue – are governed by gender and gender stereotyping (Egan & Perry, 2001). Nosek et al. (2002) also showed that the stronger the cognitive associations between self and gender category, the more likely are individuals to use gender stereotypes as guides for their own conduct. Moreover, these authors argue that is not necessary for one to consciously endorse gender stereotypes in order for them to have an effect on behavior (Nosek et al., 2002).

According to Eccles (2009), gender-role related experiences adopted through the socialization process lead boys and girls to have different hierarchies of core personal values, which further translate into different values on various life goals and adult activities. In a longitudinal study of adolescent life transitions, Eccles and colleagues (1999) found that girls place more value than boys on the importance of making occupational sacrifices for one's family

and on the importance of having a job that allows one to both help others and do something worthwhile for society. On the other hand, boys place more value on becoming famous, making lots of money, seeking out challenging tasks, and doing work that involves the use of math and computers. Thus, these core communal values in girls and agentic values in boys grafted onto their self-concept and identity reflect in their preferences, choices, even thoughts about one's own abilities. It has been found that, compared to boys, girls report higher competence beliefs and interest in languages and arts – stereotypically feminine domains (Jacobs et al., 2002; Lupart et al., 2004), than in sport, mathematics and physics – stereotypically masculine fields (Eccles, 2011; Eccles & Harold, 1991). Whilst most girls perform as well as boys in these subjects at earlier ages, gender disparities in science, technology, engineering and mathematics (STEM fields) emerge in adolescence as girls move into high school and college – the career-choosing years (Osborne, 2007). Thus, young women are still less likely than young men to engage in majors related to math and science (Moss-Racusin et al., 2018), whereas young men are still less interested in health care, elementary education, and in the domestic sphere compared to girls (HEED fields; Block et al., 2018). This occupational segregation is also based on the communion versus agency differentiation (Eagly, 1987). In STEM fields agentic qualities associated with the masculine stereotype are required, such as self and achievement orientation, dominance and the will to compete. In HEED fields, on the other side, communal qualities associated with typical female stereotype are required, such as being tenderminded, sociable, kind and oriented toward others (Heilman, 2012). Although the number of women in STEM-related fields has risen throughout previous decades, females remain underrepresented in these domains (Picho et al., 2013). Similarly, men's entry into HEED fields remained low over the last half-century (Croft et al., 2015; Van Grootel et al., 2018). This occupational segregation is one of the most important and enduring aspects of the labor market (OECD, 2017; WEF, 2017). Agentic qualities being viewed as more important for STEM fields (Van Grootel et al., 2018), leadership and positions of power (Kauppinen & Aaltio, 2003), perpetuates the stereotype of competence and success in life and career being a “masculine thing”. On the other hand, connecting exclusively communion to HEED fields contributes to the negative impact of stereotypical expectations of masculinity: It might prevent boys and men to develop and express attachment to family- and relationship-oriented roles due to pressure on young boys to prove their masculinity and avoid appearing feminine at any cost (e.g., Arbeit et al., 2016). On a societal level, this has larger repercussions in

terms of persistent gender division of labor, gender gaps in certain domains and gender inequalities with women having lower status and lower paying jobs (Anker, 2001, Bettio & Verashchagina, 2009).

Thus, gender roles and gender stereotypes define what men and women could and should do with their life and how successful they will be in that role (Eccles, 2009). For instance, women's underperformance on academic tasks from typically masculine field (e.g., mathematics) has been shown experimentally: When negative stereotypes on women's lower abilities in that field are made salient, women achieve statistically worse test results compared to women who were not exposed to the stereotype (Steele, 1997; Schmader & Johns, 2003). This phenomenon, known as *stereotype threat*, seems to be a result of negative emotional states – fear and worry of confirming the negative group stereotype that block effort investment and capacities to perform well (Bosson et al., 2004; Drace et al., 2020; Osborne, 2007). Chronic exposure to stereotype threat can result in the avoidance of threatening situations and, through this withdrawal from the domain, result in lower grades and academic success (Massey et al., 2005). Moreover, the experience of stereotype threat has been shown to have direct negative effects on physiological and psychological health (Aronson et al., 2013). For instance, Blascovich et al., (2001) found that stereotype threat induces anxiety and elevates blood pressure. However, gender stereotypes and self-stereotyping have been found to affect physiological and psychological health beyond experimental conditions of induced stereotype threat effects (Helgeson, 1994). It has been repeatedly shown that differences in the extent to which individuals adopt agentic and communal traits in their self-concept impact their psychological adjustment and well-being (Abele 2014; Fournier & Moskowitz 2000; Markstrom-Adams, 1989; Saragovi et al. 2002; Saragovi et al. 1997; Sheldon & Cooper, 2008). Previously it psychological well-being was assumed to correspond to the “successful adoption of gender-typical behaviors and traits” (Markstrom-Adams, 1989; Whitley, 1983), whereas newer studies show stronger importance of high agency (Abele et al., 2016; Helgeson, 1994; Saragovi et al., 2002) or equal importance of high agency and high communion for optimal levels of well-being (Bem, 1981; Boldizar, 1991; Pauletti et al., 2017).

2. Goals of the dissertation

Engagement in academic domains, choosing a career, and even levels of mental health and well-being are influenced by gender stereotypes and agency and communion in one's self-concept (Bandura et al., 2001; Correl, 2004; Eagly & Wood, 2012; Eccles, 2009; Gottfredson, 2005). Gender differences in education and occupational aspirations can have additional far-reaching consequences not only on the gender segregation of the labor market, but on different status and earnings (Anker, 2001) and consequently different overall life quality of men and women (Cochran et al., 2011). Scholars repeatedly draw attention to the role of gender self-stereotyping (Bandura et al., 2001; Correl, 2004; Eagly & Wood, 2012; Eccles, 2009; Gottfredson, 2005) in order to better understand precedents of persistent gender differences, form strategies to combat gender stereotypes and reduce gender inequalities.

As adolescence is a crucial period in which identity is being formed and educational and occupational aspirations and prerequisites for well-being are being developed, investigating the effects of gender stereotypes and self-stereotyping in this period is of utmost importance. Importantly, newer studies indicate changes in gender role self-concept in today's adolescents and youth in terms of higher reluctance toward gender roles, traits and behaviors (Helgeson, 2015). The current dissertation builds on previous findings and expands their scope to investigate whether adolescents still self-stereotype themselves regarding agency and communion nowadays and how that affects: 1) their occupational aspirations in terms of gender typicality, prestige and leadership desire; 2) their school-related well-being, and 3) their engagement and motivation in the stereotyped domain of digital learning.

3. Synopsis of publications

1st Publication

Korlat, S., Foerst, N., Schultes, M.-T., Schober, B., Spiel, C., & Kollmayer, M. (2021). Gender role identity and gender intensification: Agency and communion in adolescents' spontaneous self-descriptions. *European Journal of Developmental Psychology*. Advance online publication. <https://doi.org/10.1080/17405629.2020.1865143>

Previous studies investigating gender self-stereotyping and gender intensification among adolescents yielded heterogeneous results (e.g., Block et al., 2018; Boldizar, 1991; Galambos et al., 1990; Klaczynski et al., 2020;), with some studies indicating a narrowing of the gender gap for agency (Priess et al., 2009; Wichstrøm, 1999). However, all of those studies used a quantitative measurement approach such as the Bem Sex Role Inventory (BSRI, Bem, 1974) or similar instruments (e.g., the Children Sex Role Inventory; Boldizar, 1991) to assess the extent to which individuals describe themselves in stereotypically gendered ways. This approach has been heavily critiqued as it might not reveal dimensions truly relevant for one's self-concept (McGuire & McGuire, 1982, 1988) due to predetermined list of attributes selected by researchers and not respondents themselves (Brinthaup & Erwin, 1992). The first study of the present dissertation sought to examine gender self-stereotyping and intensification in adolescents' gender role identities by applying the *spontaneous self-description method* that allows participants to openly name attributes that are salient and significant to them, unfiltered by researchers' pre-selection of attributes. Indices of agency and communion in their self-descriptions are derived afterwards. Scholars argue that this method can reveal dimensions that are truly relevant in one's self-concept (Brinthaup & Erwin, 1992; McGuire & Padawer-Singer, 1976; McGuire & McGuire, 1988; Uchrowski, 2008). Moreover, the spontaneous self-description method allows to examine gender differences in the specific attributes that spontaneously come to girls' and boys' minds when describing themselves, rather than in mean scores of agency and communion only. In the first study, data from the REFLECT program was used, within which 3423 adolescents (1706 girls, $M_{age} = 12.41$, $SD_{age} = 0.99$; 1717 boys, $M_{age} = 12.52$, $SD_{age} = 1.02$, age-range 11-15) answered an open question: "How would you describe yourself to someone who you do not know yet? Please write down three attributes that describe you best. Please do not describe how you look but describe your personality (an example attribute: honest)." Participants

described themselves in an open-ended format by writing down three attributes. All answers were cleaned, categorized and coded in terms of agency and communion by a group of trained researchers. The raters achieved substantial inter-coder agreement ($\kappa = 0.65$), and data was analyzed at two levels: at the individual level examining whether boys and girls self-stereotype themselves and whether their gender role identity becomes more gendered through the period of early adolescence; and at the attribute level, investigating gender differences in the individual attributes adolescents use in their spontaneous self-descriptions. Due to the heterogeneous ethnicity of the sample, adolescents' migration background was included as a control variable in the analysis testing the gender intensification hypothesis. Results showed that girls used more communal words in their self-descriptions than boys, while boys used more agentic terms in their self-descriptions than girls – confirming the self-stereotyping pattern found in previous studies (Block et al., 2018; Klaczynski et al., 2020; Ojanen et al., 2005; Priess et al., 2009; Skinner et al., 2019; Wichstrøm, 1999). However, effect sizes were small for communion ($\eta^2_p = .009$), but even smaller for agency ($\eta^2_p = .002$), indicating a narrowing of the gender gap for agency. Interestingly, results showed that not only girls but also boys, on average, included more communal than agentic attributes in their self-descriptions, which could indicate narrowing of the gender gap for communion as well. Importantly, our results did not support the gender intensification hypothesis, showing that agency and communion increase in parallel fashion in both boys and girls from age 11 to 15 (cf. Block et al., 2018; Priess et al., 2009; Wichstrøm, 1999). Moreover, results of the analyses at the attribute level showed gender differences in only 17.4% of the named attributes. When allowed to describe themselves spontaneously, both boys and girls use a large number of neutral attributes to describe themselves (Donnelly & Twenge, 2017; Jackson, 1985). Taken together, these results support Hyde's (2005) gender similarities hypothesis, which states that boys and girls are more similar than different on majority of psychological variables. These findings indicate changes in gender self-stereotyping and gender role adoption in newer generations of adolescents with decreasing differences between boys' and girls' self-concept and gender role identity.

2nd Publication

Korlat, S., Schultes, M.-T., Schober, B., Spiel, C., & Kollmayer, M. (submitted). Adolescents' Gender Role Identity and Occupational Aspirations: Gender Typicality, Prestige and Leadership Desire. *Psychology of Women Quarterly*.

The second study builds on the first study using the same sample and the same method but expands its focus to gender differences in occupational aspirations across early adolescence taking into account the role of self-stereotyping regarding agency and communion. As STEM professions, managerial positions and prestigious occupations are typically associated with stereotypically masculine traits, scholars have indicated the importance of the gender typed personality traits – agency and communion – in understanding gender segregation in occupational aspiration and choices (e.g., Bandura et al., 2001; Correl, 2004; Eagly & Wood, 2012; Eccles, 2009; Gottfredson, 2002). Thus, the goal of the second study was to investigate 1) whether adolescents boys and girls aspire to gender typical jobs, 2) whether this pattern changes throughout the course of early adolescence, 3) in which specific occupations boys' and girls' aspirations differ; 4) are there gender differences in aspirations to occupations of different prestige and status, 5) are there gender differences in leadership desire; and finally 6) can gender differences regarding typicality, prestige and leadership desire in occupational aspirations be explained by self-stereotyping regarding agency and communion. Data from the same project as in Study 1 was used, wherein 2779 adolescents (1418 girls, $M_{age} = 12.47$, $SD_{age} = 1.00$; age-range 11–15) answered a question: "Imagine that you could look into the future with a crystal ball and see yourself as an adult in your future career. As what or where do you work?". All named occupations were coded based on ISCO classification of occupations in Austria and the percentage of females working in the field of named occupations in Austria was assigned to each occupation as an indicator of gender typicality. International Socio-Economic Index of Occupational Status (ISEI) (Ganzeboom et al., 1992) was used to map the status and prestige level associated with each occupation. Leadership desire was coded dichotomously based on whether the adolescents spontaneously expressed leadership desire in their answer or not. Agency and communion variables from Study 1 were used as mediators. Results showed significant differences between boys and girls in the gender typicality of named occupations with boys expressing a clear preference for typically masculine occupations and girls for typically feminine occupations (Su et al., 2009; Wegemer & Eccles, 2019; Wicht et al., 2021). This pattern

was even more emphasized in the analysis of differences in specific occupations where typically feminine occupations (such as childcare, primary school teachers, nurses) emerged as predominantly girls' answers, and typically masculine occupations (such as mechanics, plumbers, engineers) emerged as predominantly boys' answers. This pattern did not vary with age. In line with previous studies, girls were found to aspire to more prestigious occupations (Rani, 2018; Watts et al., 2015; Wicht, 2016, 2021), whereas no gender differences were found in leadership desire. Mediation analyses showed communion as a significant mediator between gender and aspirations to typically feminine occupations, partially explaining girls' preference for typically feminine choices. Interestingly, agency did not mediate relationship between gender and typicality of occupational aspirations. This result challenges the notion that agency is a prerequisite for typically masculine occupations and indicates that communal characteristics might be perceived as required for typically feminine occupations nowadays more than agentic qualities are perceived as required for typically masculine occupations. Agency was shown as a significant mediator between gender and prestige of occupational aspiration, whereas neither agency nor communion played a role in leadership desire. However, results showed leadership desire expressed spontaneously in only 7.7% of cases. Nevertheless, more prestigious occupational aspirations in girls compared to boys and no gender differences in leadership desire underline the previous argument that girls probably face occupational barriers in the system that hinder them from realizing these aspirations that are equal or higher than those of adolescent boys (Wicht et al., 2021). Our results emphasize the further need to better understand which (gender-related) factors contribute to gender division of labor.

3rd Publication

Korlat, S., Holzer, J., Schultes, M.-T., Bürger, S., Schober, B., Spiel, C., & Kollmayer, M. (under review). Psychological Androgyny in School: Associations Between Adolescents' Gender Role Self-Concept and School-Related Well-Being. *School Mental Health*.

The third study expands the focus of the dissertation and covers the role of agency and communion in psychological well-being. Well-being in adolescence plays a crucial role as it enables young people to deal with developmental tasks and promote a healthy transition to adulthood (Pyhälä et al., 2010). However, previous studies investigating the role of gender self-stereotyping in well-being focused on *hedonic* aspects of well-being where well-being is defined in terms of attaining pleasure and avoiding pain (Kahneman et al., 1999). With the growth of positive psychology, well-being has been reconceptualized in a way that focuses less on the mere absence of psychopathological features and more on the presence of resources and self-actualization – to cover both *hedonic* and *eudemonic* aspects (Kern et al., 2015). Previous studies investigating youth's optimal well-being did not focus on specific domains, but rather on general well-being. As the place where adolescents spend almost one-third of their lives, school is one of the most important contexts within which adolescents' development, including their well-being and gender socialization, unfolds (Bolzendahl & Myers, 2004; Eccles, 2004). Therefore, the third study focuses on the role of gender self-stereotyping in school-related well-being defined in terms of both hedonic and eudemonic aspects in order to cover the full variety of adolescents' psychological functioning in the school context. In total 999 secondary school students (52.2% girls, 47.8% boys, $M_{age} = 13.79$, $SD_{age} = 1.53$; age range 12-17) answered inventories assessing adolescents' gender role self-concept (GRI-JUG) and school-related well-being (EPOCH-G-S) in terms of overall school-related well-being as well as its five dimensions: Engagement, Perseverance, Optimism, Connectedness, and Happiness. Results supported the androgyny model of well-being but indicated a stronger importance of femininity in adolescence and in the school context than previously reported in scientific studies. Result also showed higher levels of overall school-related well-being and all dimensions except for optimism in girls compared to boys. Our results emphasize the need to actively enhance both agentic and communal traits and behaviors, especially in boys, through curricular activities and interventions in the school context in order to maximize adolescents' school-related well-being.

4th Publication

Korlat, S., Kollmayer, M., Holzer, J., Lüftenegger, M., Pelikan, E., Schober, B., & Spiel, C. (2021). Gender Differences in Digital Learning During COVID-19: Competence Beliefs, Intrinsic Value, Learning Engagement, and Perceived Teacher Support. *Frontiers in Psychology*, 12: 637776, 1-12. <https://doi.org/10.3389/fpsyg.2021.637776>

In line with gender stereotypes associating technical and math-intensive fields with masculine qualities (Charles & Bradley, 2009), computers and technology use have been perceived as masculine and therefore more suitable for boys than girls (Copper, 2006). Accordingly, boys report higher frequency of computer use and greater competence beliefs in dealing with computers (Colley & Comber, 2003). As the COVID-19 pandemic quickly necessitated digital learning, concerns have been raised about potential challenges for girls who might be disadvantaged in a virtual classroom due to their lower perceived ability, comfort and engagement with computers (Ashong & Commander, 2012; Price, 2006; Yates, 2001). UNESCO and scholars have called for recognizing the gender dimension of school closures due to COVID-19, especially in light of the gender digital gap (IIEP-UNESCO, 2020; Nefesh-Clarke et al., 2020). The fourth study addresses this issue investigating gender differences in digital learning using both biological sex as well as gender role self-concept in order to investigate the role of gender in different components of this stereotyped domain. A total of 19,190 Austrian secondary school students (61.9% girls, Mage = 14.55, SDage= 2.49, age range 10-21) participated in an online study in April 2020 and answered questions regarding competence beliefs, intrinsic value, engagement and perceived teacher support in digital learning during the pandemic-induced school closures. Contrary to expectations, our results challenge the notion of girls' potential disadvantages in the virtual classroom and reveal their relatively higher levels of perceived social support from teachers, intrinsic value and engagement in digital learning. No significant sex differences were found in competence beliefs regarding digital learning. Furthermore, results indicated clear benefits of an androgynous gender role self-concept for all studied components of digital learning. Findings of Study 4 provide guidelines for designing distance education in a way that would improve both boys' and girls' digital learning in the COVID-19 era.

4. Discussion

Gender stereotypes set expectations in a society on what men and women could and should be like, what they could and should do and how successful they will be in a given role. These expectations are based on an assumed fit of women's communion in human-centered fields and supportive roles and men's agency in impersonal and tech-intensive fields and roles of power (Charles & Bradley, 2009; Mendez & Crawford, 2002). With the goal of cognitive consistency and avoidance of incongruity between social expectations and self (Bem, 1981; Tajfel & Turner, 1986), individuals adopt stereotypical roles and behavior in their self-concept during early adolescence when preparation for approaching adult roles begins (Hill & Lynch, 1983). This has far-reaching consequences on boys and girls in different aspects of life – from mental health to educational engagement and career options. Therefore, the aim of the present dissertation was to examine 1) whether adolescents still gender self-stereotype themselves nowadays and whether their gendered identity intensifies during early adolescence, assessing their self-stereotyping with a more valid method than previous studies, and 2) how self-stereotyping affects their psychological functioning in terms of occupational aspirations, school-related well-being and digital learning especially relevant during the COVID-19 pandemic.

Study 1 of the dissertation tested the gender intensification hypothesis (Hill & Lynch, 1983) using the method of spontaneous self-description and provided important findings to the literature. First, it showed that when adolescents are enabled to describe themselves spontaneously with attributes salient for their self-concept, self-stereotyping in terms of gender is less perceptible. Although some studies using pre-determined attribute lists also did not find evidence of gender intensification (e.g., Block et al., 2018; Priess et al., 2009; Wichstrøm, 1999), our findings clearly showed very small percentage of attributes for which gender differences exist, and the large number of neutral attributes used by both boys and girls to describe themselves. Thus, our results are in line with other studies arguing that newer generations of young people are potentially moving toward a post-gender culture, deliberately disassociating themselves from characteristics linked to traditional conceptions of masculinity and femininity (Donnelly & Twenge, 2017; Gerson, 2010; McDowell, 2012). Second, our results also confirmed the previously found narrower gender gap for agency – with only small differences between boys' and girls' use of agentic attributes in their self-descriptions. But importantly, our results

showed a prevalence of communal over agentic attributes in boys' as well as in girls' self-description, indicating a potential narrowing of the gender gap for communion as well. This is a novel finding, given the often reported higher gender conformity pressure among boys than girls (Egan & Perry, 2001; Nielson et al., 2020). Thus, it might be that boys nowadays may feel more free to adopt communal attributes in their self-descriptions, despite stronger disapproval of gender role violations in boys (e.g., Kane, 2006; Sirin et al., 2004). Another explanation could be the method of spontaneous self-description used in our study: It could be that pre-determined attribute lists pressured boys and men to choose more masculine attributes for their self-descriptions in order to "prove" their masculinity and avoid appearing feminine. When allowed to describe themselves spontaneously, boys used communal and neutral words in their self-description more frequently. Thus, our results could be an accurate depiction of boys' self-image that was not captured in previous studies examining self-ratings on predetermined attributes. Whilst judgement biases are a general point of critique with respect to rating scales (Poulton, 1989), the problem is even more severe in the field of stereotypes – which are highly influenced by cues and triggers (e.g., Cheryan et al., 2009; Pennington et al., 2016). Thus, investigating self-stereotyping, or another aspect of functioning that is governed by stereotypes, benefits from spontaneous self-description method. Third, significant gender differences found in attributes currently popular in youth culture (such as "crazy" and "cool") may speak in favor of the need to adapt existing tools that use "attributes selected on the basis of differential ratings for men and women obtained decades ago" (Berger & Krahé, 2013, p. 518) by incorporating new attributes that better reflect this generation's culture and language. In general, our study underlines that for adolescent samples, a bottom-up approach to assessing self-stereotyping is beneficial to ensure that the attributes examined have lingual proximity and relevance for adolescents. Taken together, boys' and girls' gender role self-concept might be more similar than different, supporting Hyde's (2005) gender similarity hypothesis.

Given the changes in adolescents' self-concept, the second, third and fourth study investigated the role of gender self-stereotyping in important aspects of adolescents' psychological functioning. Three aspects of adolescence functioning were chosen based on their developmental relevance in this period of life and their susceptibility to negative effects of gender stereotyping: occupational aspirations, school-related well-being and digital learning during the COVID-19 pandemic. Study 2 focused on occupational aspirations in terms of gender

typicality, prestige and leadership desire. Despite the potential changes in boys' and girls' self-concept found in Study 1 and some improvements regarding gender equality in the labor market (Picho et al., 2013), results of Study 2 showed a steady presence of gender stereotypes in career-related aspirations in adolescence: Boys aspire to typically masculine occupations more than girls, while girls aspire to typically feminine occupations more than boys. This pattern is especially evident when gender differences in specific occupations are investigated where typically feminine occupations (such as childcare, primary school teachers, nurses) emerged as predominantly girls' answers, and typically masculine occupations (such as mechanics, plumbers, engineers) emerged as predominantly boys' answers.

Nevertheless, strong stereotypical gender differences in occupational aspirations are not surprising given that one's profession is the most visible and public social role and deviation from societal expectations for this role could be the most threatening for self. However, our results, in line with previous studies, showed that girls aspire to more prestigious jobs than boys, while no significant gender differences were found in spontaneously expressed leadership desire. Similarly, recent statistics show higher educational attainment among young women compared to young men (Eurostat, 2019a), but labor market statistics still indicate a predominance of men on managerial and higher status positions that provide more lucrative earnings (Eurostat, 2019b). Our results, thus, underline the previous argument that girls probably face occupational barriers in the system that hinder them from realizing their aspirations that are equal or higher than those of boys (Wicht et al., 2021). It seems that slowly changing gender role norms condition the persisting gender segregation of the labor market, even though self-concept, ambitions, educational requirement, and other characteristics of the genders are changing more rapidly (Bertrand, 2011). Our results showed agency as a significant mediator between gender and prestige of occupational aspirations, indicating that typically masculine characteristics are a prerequisite for aspiring to higher status occupations. Interestingly, only communion was found to mediate the relationship between gender and gender typicality of occupational aspiration. For these adolescent girls, social occupational preferences, which are stereotypically feminine occupations and require communal traits, are congruent with their gender self-concept (Diekmann et al., 2017; Eccles et al., 2007; Gottfredson et al., 2005). Interestingly, agency was not a significant mediator between gender and gender typicality of occupational aspirations. One explanation of these finding could be a higher importance of communion for social and human-

centered occupations than of agency in impersonal and thing-related occupations named by adolescents. Moreover, the prevalence of communal over agentic attributes used in both boys' and girls' self-description could have attributed to insignificance of agency in the mediation model.

In Study 3, the role of agency and communion in school-related well-being was investigated. The contribution of this study is twofold: 1) it tests the role of agency and communion for well-being in a specific context – school, that is a place of great importance in this period of life, and 2) it includes both hedonic and eudemonic aspects of well-being, thus covering the full variety of adolescents' functioning. Our results support the androgyny model of well-being with adolescents encompassing both communal and agentic aspects in their self-concept achieving the highest levels of overall well-being, as well as the highest levels of hedonic (optimism and happiness) and eudemonic (engagement, perseverance, connectedness) well-being dimensions. This finding is not surprising given that school is the first social space after the home in which individuals experience obligations, engagement, commitment and relationships. Thus, having a broader set of attributes and behavioral options that allow for flexible behavior and successful coping with different demands is more important in school than anywhere else during childhood and adolescence. Surprisingly, and contrary to expectations, our results showed equal contribution of agency and communion to overall well-being as well as single dimensions, despite the clear dominance of agency over communion for general well-being reported in previous studies (e.g., Helgeson, 1994; Priess et al., 2009; Wichstrøm, 1999; Withley, 1985). This result of Study 3 speaks in favor of the higher relevance of communion in this period in life and in the school context than in other areas and later in life, aligned with the prevalence of communion over agency in adolescents' (both boys' and girls') self-concept found in Study 1.

In addition, study 3 showed higher engagement, perseverance, connectedness, happiness, and overall school-related well-being in girls compared to boys. This result is not so surprising given that items assessing the school-related well-being are specific to the academic context, where girls exhibit higher engagement and tend to outperform boys (Duckworth & Seligman 2006; Hartley & Sutton 2013). Similar results have been found in Study 4, in which girls scored higher than boys in three components (intrinsic value, learning engagement and perceived

teacher support) of digital learning. Although it was assumed that girls might be disadvantaged in this stereotypically masculine domain, based on their lower perceived ability, comfort and engagement with computers and technologies (Ashong & Commander, 2012; Colley & Comber, 2003; Drabowicz, 2014), girls showed advantages in named components and equal competence beliefs in digital learning compared to boys. As in Study 3, this might be due to girls' stronger learning culture and more time invested in learning (Van Houtte, 2004), that potentially translated into digital setting during pandemic-induced school-closures. These findings call for attention to boys' performance and functioning in school in order to prevent their academic underperformance and lower psychological adjustment. In Study 4, as in Study 3, androgynous adolescents scored highest on all investigated dimensions, due to their broad repertoire of traits and behaviors. Along the findings of Study 3, communion was a contributing factor to higher levels of stereotypically masculine components of digital learning as well: communal students exhibited higher levels of competence beliefs, intrinsic value and engagement in digital learning compared to agentic students. This again underlines the higher relevance of communion for adolescents and in the school context. Previous studies have also found stronger school-related self-esteem and stronger feelings of belonging at school among feminine adolescents (Skinner et al., 2019). Thus, the results of this thesis are in line with scholars' notions that adolescence (Chen et al., 2018) and school (Heyder & Kessels, 2013) are communal in nature, probably due to their emphasized social component and importance of peer relationships in this context and this period in life.

Overall, the results of Studies 3 and 4 emphasize the importance of both high agency and high communion in adolescents' engagement and enjoyment in school activities (even in the fundamentally altered learning setting during the stressful period of a pandemic), perseverance in those activities, connection with peers and teachers and positive affect in terms of happiness in school and optimism. Study 3 shed light on the role of agency and communion in well-being and functioning in school-context. Study 4 broadens the scope of the existing literature that focused on gender differences and the role of gender self-stereotyping in competence beliefs, intrinsic value and engagement in mainstream school-subjects that are considered masculine (e.g., mathematics, physics, languages, sport) to a domain related to the gender digital gap. Thus, study 4 contributes to the evidence on value-expectancy model (Eccles-Parsons et al., 1983), testing gender differences in components of digital learning relevant for learning process during and

beyond pandemic-induced school closures. Of all investigated aspects and developmental milestones within this dissertation, occupational aspirations seem to fall under the highest influence of gender stereotypes, confirming Eccles' (2009) notion that core stereotypical values in girls' and boys' self-concept and identity reflect in their preferences toward various long-range goals and adult activities.

A limitation of the present dissertation is the use of the cross-sectional data in correlational designs, which limits the ability to draw developmental conclusions. Future research should investigate gender self-stereotyping and intensification longitudinally using the method of spontaneous self-description. Effects of self-stereotyping should be observed experimentally in order to enable causal inference. Further research should also include other gender- and context-related constructs (such as values, cognitions and influences) in models predicting and explaining gender differences in different aspects of life. However, the present thesis encompassing large samples of adolescents in each study provides a good overview of the role of gender self-stereotyping regarding agency and communion in adolescents' self-concept and psychological functioning.

Conclusion

It seems that core traits in adolescent boys' and girls' self-concept are shifting away from stereotypical toward more neutral and balanced patterns. The benefits of an androgynous self-concept have been shown in this thesis in school context – in terms of engagement and enjoyment in learning (even in digital setting), social relatedness and positive affect. Fostering sense of agency and focus on self, along with sense of relatedness and focus on others in adolescents' self-concept and identity could maximize their psychological adjustment. Taking that into account, schools should develop curricular activities and a classroom environment (both online and onsite) in a way that enhances both communal and agentic traits and behaviors in boys and girls to mitigate stereotypes and their consequences for both boys and girls. Interventions might focus on building performance- and achievement-related traits and goals as well as social-related traits and goals among all students. Such programs can not only contribute to school-related well-being and better learning processes among adolescents, but additionally decrease gender typing, which can result in reduced gender stereotypes in newer generations of

adolescents. On the other hand, more systematic changes might be necessary in order to enable gender similarities from adolescence to persist through adulthood and secure equal work and life opportunities for men and women. However, “adolescents and young people are not just passive recipients of pressures to conform to gender norms; rather, they are actively engaged with shaping and changing gender norms as they endorse, resist, or alter them in a variety of contexts, from interpersonal to institutional” (Yu et al., 2017, p. 49) – and internal changes in self-stereotyping might be the first step toward those changes.

References

- Abele, A. E., & Wojciszke, B. (2007). Agency and communion from the perspective of self versus others. *Journal of Personality and Social Psychology*, 93(5), 751-763. <https://doi.org/10.1037/0022-3514.93.5.751>
- Abele (2014). Pursuit of communal values in an agentic manner: a way to happiness? *Front. Psychol.*, 5:1321. <https://doi.org/10.3389/fpsyg.2014.01320>
- Allport, G. W. (1954). *The nature of prejudice*. Addison-Wesley.
- Ambady, N., Shih, M., Kim, A., & Pittinsky, T. L. (2001). Stereotype Susceptibility in Children: Effects of Identity Activation on Quantitative Performance. *Psychological Science*, 12(5), 385-390. <https://doi.org/10.1111/1467-9280.00371>
- Anker, R. (2001). *Gender and Jobs: Sex Segregation of Occupations in the World*. International Labour Office.
- Arbeit, M. R., Hershberg, R. M., Rubin, R. O., DeSouza, L. M., & Lerner, J. V. (2016). “I’m hoping that I can have better relationships”: Exploring interpersonal connection for young men. *Qualitative Psychology*, 3(1), 79–97. <https://doi-org/10.1037/qup0000042>
- Aronson, E., Wilson, T. D., & Akert, R. (2005). *Social Psychology* (5th ed.). Prentice Hall.
- Aronson, J., Burgess, D., Phelan, S. M., & Juarez, L. (2013). Unhealthy interactions: The role of stereotype threat in health disparities. *American Journal of Public Health*, 103(1), 50–56. <https://doi-org/10.2105/AJPH.2012.300828>
- Ashong, C. Y., & Commander, N. E. (2012). Ethnicity, gender, and perceptions of online learning in higher education. *Journal of Online Teaching and Education*, 8(2), 98.
- Bakan, D. (1966). *The duality of human existence: An essay on psychology and religion*. Rand McNally.
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Prentice Hall.
- Bandura, A. (2001). Social cognitive theory: An agentic perspective. *Annual Review of Psychology*, 52, 1–26. <https://doi-org/10.1146/annurev.psych.52.1.1>

- Bem, S. L. (1974). The measurement of psychological androgyny. *Journal of Consulting and Clinical Psychology*, 42(2), 155-162. <https://doi.org/10.1037/h0036215>
- Bem, S. L. (1981). Gender schema theory: A cognitive account of sex typing. *Psychological Review*, 88(4), 354-364. <https://doi.org/10.1037/0033-295X.88.4.354>
- Berger, A., & Krahé, B. (2013). Negative attributes are gendered too: Conceptualizing and measuring positive and negative facets of sex-role identity. *European Journal of Social Psychology*, 43(6), 516–531. <https://doi.org/10.1002/ejsp.1970>
- Bertrand, M. (2011). *New Perspectives on Gender*, In: Ashenfelter O. & D. Card (eds), *Handbook of Labor Economics Vol 4, Part B* (pp. 1544-1590). Elsevier.
- Bettio, F., & Verashchagina, A. (2009). *Gender segregation in the labour market: Root causes, implications and policy responses in the EU*. Publication Office of the European Union. Retrieved on April 4, 2021 from: <https://op.europa.eu/en/publication-detail/-/publication/39e67b83-852f-4f1e-b6a0-a8fbb599b256>
- Blakemore, J. E., Owen, C., & Renee, E. (2005). Characteristics of Boys' and Girls' Toys. *Sex Roles*, 53(9), 619-633. <https://doi.org/10.1007/s11199-005-7729-0>
- Blascovich, J., Mendes, W. B., Hunter, S. B., Lickel, B., & Kowai-Bell, N. (2001). Perceiver threat in social interactions with stigmatized others. *Journal of Personality and Social Psychology*, 80(2), 253–267. <https://doi-org/10.1037/0022-3514.80.2.253>
- Block, K., Gonzalez, A. M., Schmader, T., & Baron, A. S. (2018). Early gender differences in core values predict anticipated family versus career orientation. *Psychological Science*, 29(9), 1540-1547. <https://doi.org/10.1177/0956797618776942>
- Block, K., Croft, A., & Schmader, T. (2018). Worth Less?: Why Men (and Women) Devalue Care-Oriented Careers. *Front. Psychol.* 9:1353. <https://doi.org/10.3389/fpsyg.2018.01353>
- Boldizar, J. P. (1991). Assessing sex typing and androgyny in children: The Children's Sex Role Inventory. *Developmental Psychology*, 27(3), 505-515. <https://doi.org/10.1037/0012-1649.27.3.505>

- Brinthaupt, T. M., & Erwin, L. J. (1992). *Reporting about the self: Issues and implications*. In SUNY Series, Studying the Self. The self: Definitional and methodological issues (pp. 137–171). State University of New York Press.
- Brown, R. (1995). *Prejudice: its social psychology*. Blackwell.
- Bussey, K., & Bandura, A. (1999). Social cognitive theory of gender development and differentiation. *Psychological Review*, 106(4), 676-713. <https://doi.org/10.1037/0033-295X.106.4.676>
- Bolzendahl, C. I., & Myers, D. J. (2004). Feminist Attitudes and Support for Gender Equality: Opinion Change in Women and Men, 1974-1998. *Social Forces*, 83(2), 759–789. <https://doi.org/10.1353/sof.2005.0005>
- Bosson, J. K., Haymovitz, E. L., & Pinel, E. C. (2004). When Saying and Doing Diverge: The Effects of Stereotype Threat on Self-reported Versus Nonverbal Anxiety. *Journal of Experimental Social Psychology*, 40(2), 247-255. [https://doi.org/10.1016/S0022-1031\(03\)00099-4](https://doi.org/10.1016/S0022-1031(03)00099-4)
- Charles, M., and Bradley, K. (2009). Indulging our gendered selves? Sex segregation by field of study in 44 countries. *Am. J. Sociol.* 114, 924–976. <https://doi-org/10.1086/595942>
- Chen, F., Zhu, S., & Bi, C. (2018). The Development of Self-Esteem and the Role of Agency and Communion: A Longitudinal Study among Chinese. *Journal of Child and Family Studies*, 27(3), 816–824. <https://doi.org/10.1007/s10826-017-0942-y>
- Cheryan, S., Plaut, V. C., Davies, P. G., & Steele, C. M. (2009). Ambient belonging: How stereotypical cues impact gender participation in computer science. *Journal of Personality and Social Psychology*, 97(6), 1045–1060. <https://doi.org/10.1037/a0016239>
- Cochran, D.B., Wang, E.W., Stevenson, S.J., Johnson, L.E. and Crews, C. (2011), Adolescent Occupational Aspirations: Test of Gottfredson's Theory of Circumscription and Compromise. *The Career Development Quarterly*, 59, 412-427. <https://doi-org/10.1002/j.2161-0045.2011.tb00968.x>

- Cohen, G. L., & Garcia, J. (2005). "I Am Us": Negative Stereotypes as Collective Threats. *Journal of Personality and Social Psychology*, 89(4), 566-582. <https://doi.org/10.1037/0022-3514.89.4.566>
- Colley, A. & Comber, C. (2003). Age and gender differences in computer use and attitudes among secondary school students: what has changed? *Educational Research*, 45(2), 155-165. <https://doi.org/10.1080/0013188032000103235>
- Cooper, J. (2006). The digital divide: the special case of gender. *Journal of Computer Assisted Learning*, 22(5), 320-334. <https://doi.org/10.1111/j.1365-2729.2006.00185.x>
- Correll, S. J. (2004). Constraints into Preferences: Gender, Status, and Emerging Career Aspirations. *American Sociological Review*, 69(1), 93–113. <https://doi.org/10.1177/000312240406900106>
- Côté, J. E. (2009). Identity Formation and Self-Development in Adolescence. In R. M. Lerner (Ed.), *Handbook of Adolescent Psychology* (pp. 266-304). Wiley. <https://doi.org/10.1002/9780470479193.adlpsy001010>
- Croft, A., Schmader, T., and Block, K. (2015). An underexamined inequality: cultural and psychological barriers to men's engagement with communal roles. *Pers. Soc. Psychol. Rev.*, 19, 343–370. <https://doi.org/10.1177/1088868314564789>
- Cross, S. E., & Madson, L. (1997). Models of the self: Self-construals and gender. *Psychological Bulletin*, 122(1), 5-37. <https://doi.org/10.1037/0033-2909.122.1.5>
- Damon, W., Lerner, R. M. (2008). *Child and Adolescent Development – An Advanced Course*. John Wiley & Sons, Inc.
- Deaux, K., & LaFrance, M. (1998). *Gender*. In D. T. Gilbert, S. T. Fiske & G. Lindzey (Eds.), *The handbook of social psychology* (pp. 788-827). McGraw-Hill.
- Diekmann, A. B., Clark, E. K., Johnston, A. M., Brown, E. R., & Steinberg, M. (2011). Malleability in communal goals and beliefs influences attraction to stem careers: Evidence for a goal congruity perspective. *Journal of Personality and Social Psychology*, 101(5), 902–918. <https://doi-org/10.1037/a0025199>

- Diekman, A. B., & Eagly, A. H. (2000). Stereotypes as dynamic constructs: Women and men of the past, present, and future. *Personality and Social Psychology Bulletin*, 26, 1171–1188. <http://dx.doi.org/10.1177/0146167200262001>
- Donnelly, K., & Twenge, J. M. (2017). Masculine and feminine traits on the Bem Sex-Role Inventory, 1993–2012: A cross-temporal meta-analysis. *Sex Roles*, 76(9-10), 556–565. <https://doi.org/10.1007/s11199-016-0625-y>
- Drabowicz, T. (2014). Gender and digital usage inequality among adolescents: A comparative study of 39 countries. *Computers & Education*, 74, 98-111. <https://doi.org/10.1016/j.compedu.2014.01.016>
- Drace, S., Korlat, S., & Đokić, R. (2020). When stereotype threat makes me more or less intelligent: The informative role of emotions in effort mobilization and task performance. *Br. J. Soc. Psychol.*, 59, 137-156. <https://doi-org/10.1111/bjso.12327>
- Duckworth, A. L., & Seligman, M. E. P. (2006). Self-discipline gives girls the edge: Gender in self-discipline, grades, and achievement test scores. *Journal of Educational Psychology*, 98(1), 198–208. <https://doi.org/10.1037/0022-0663.98.1.198>
- Eagly, A. H. (1987). *John M. MacEachran memorial lecture series; 1985. Sex differences in social behavior: A social-role interpretation*. Lawrence Erlbaum Associates, Inc.
- Eagly, A. H., Wood, W., & Diekman, A. B. (2000). Social role theory of sex differences and similarities: a current appraisal. In T. Eckes & H. M. Trautner (Eds.), *The Developmental Social Psychology of Gender* (pp. 123-174). Erlbaum.
- Eagly, A. H., & Wood, W. (2012). *Social role theory*. In P. A. M. Van Lange, A. W. Kruglanski, & E.T. Higgins (Eds.), *Handbook of theories of social psychology* (pp. 458-476). Sage Publications Ltd. <https://doi.org/10.4135/9781446249222.n49>
- Eagly, A. H., Nater, C., Miller, D. I., Kaufmann, M., & Sczesny, S. (2020). Gender stereotypes have changed: A cross-temporal meta-analysis of U.S. public opinion polls from 1946 to 2018. *American Psychologist*, 75(3), 301–315. <https://doi-org/10.1037/amp0000494>

- Eccles-Parsons, J. S., Adler, T. F., Futterman, R., Goff, S. B., Kaczala, C. M., Meece, J. L., et al. (1983). *Expectancies, values, and academic behaviors*. In J. T. Spence (Ed.), *Achievement and achievement motivation* (pp. 75–146). W. H. Freeman.
- Eccles, J. S., Harold, R. D. (1991). Gender differences in sport involvement: Applying the Eccles' expectancy-value model. *Journal of Applied Sport Psychology*, 3, 7–35.
- Eccles, J. S., Midgley, C., Wigfield, A., Buchanan, C. M., Reuman, D., Flanagan, C., & Mac Iver, D. (1993). Development During Adolescence: The Impact of Stage-Environment Fit on Young Adolescents' Experiences in Schools and in Families. *The American Psychologist*, 48(2), 90-101. <https://doi.org/10.1037/0003-066X.48.2.90>
- Eccles, J. S., Barber, B., & Jozefowicz, D. (1999). *Linking gender to education, occupation, and recreational choices: Applying the Eccles et al. model of achievement-related choices*. In W. B. Swann, J. H. Langlois, & L. A. Gilbert (Eds.), *Sexism and stereotypes in modern society: The gender science of Janet Taylor Spence* (pp. 153–192). APA Press.
- Eccles, J. S. (2004). *Schools, academic motivation, and stage-environment fit*. In R. M. Lerner and L. Steinberg (Eds.), *Handbook of adolescent psychology* (p. 125–153). John Wiley and Sons Inc.
- Eccles, J. S. (2007). *Where are all the women? Gender differences in participation in physical science and engineering*. In S. J. Ceci & W. M. Williams (Eds.), *Why aren't more women in science? Top researchers debate the evidence* (pp. 199–210). Washington, DC: American Psychological Association.
- Eccles, J.S. (2009). Who am I and what am I going to do with my life? Personal and collective identities as motivators of action. *Educational Psychologist*, 44, 78-89.
- Eccles, J. (2011). Gendered educational and occupational choices: Applying the Eccles et al. model of achievement-related choices. *International Journal of Behavioral Development*, 35(3), 195–201. <https://doi.org/10.1177/0165025411398185>
- Egan, S. K., & Perry, D. G. (2001). Gender identity: A multidimensional analysis with implications for psychosocial adjustment. *Developmental Psychology*, 37(4), 451–463. <https://doi-org/10.1037/0012-1649.37.4.451>

- Eichstedt, J. A., Serbin, L. A., Poulin-Dubois, D., & Sen, M. G. (2002). Of bears and men: Infants' knowledge of conventional and metaphorical gender stereotypes. *Infant Behavior & Development*, 25(3), 296–310. [https://doi-org/10.1016/S0163-6383\(02\)00081-4](https://doi-org/10.1016/S0163-6383(02)00081-4)
- Endendijk, J. J., Groeneveld, M. G., Van Berkel, S. R., Hallers-Haalboom, E. T., Mesman, J., & Bakermans-Kranenburg, M. J. (2013). Gender stereotypes in the family context: Mothers, fathers, and siblings. *Sex Roles*, 68, 577-590. <https://doi.org/10.1007/s11199-013-0265-4>
- Erikson, E.H. (1968). *Identity: youth and crisis*. Norton & Co.
- Ertl, B., Luttenberger, S., & Paechter, M. (2017). The impact of gender stereotypes on the self-concept of female students in STEM subjects with an under-representation of females. *Frontiers in Psychology*, 8, 703-703. <https://doi.org/10.3389/fpsyg.2017.00703>
- Eurostat (2019a) Educational attainment statistics. Retrieved on April 4, 2021 from https://ec.europa.eu/eurostat/statistics-explained/index.php/Educational_attainment_statistics#Level_of_educational_attainment_by_sex
- Eurostat (2019b). Gender pay gap statistics. Retrieved on April 4, 2021 from https://ec.europa.eu/eurostat/statistics-explained/index.php/Gender_pay_gap_statistics
- Fiske, S. T., & Taylor, S. E. (2013). *Social Cognition: From Brains to Culture* (2nd ed.). SAGE.
- Fivush, R., Brotman, M. A., Buckner, J. P., & Goodman, S. H. (2000). Gender Differences in Parent–Child Emotion Narratives. *Sex Roles*, 42(3), 233-253. <https://doi.org/10.1023/A:1007091207068>
- Fournier, M. A., & Moskowitz, D. S. (2000). The mitigation of interpersonal behavior. *Journal of Personality and Social Psychology*, 79(5), 827–836. <https://doi.org/10.1037/0022-3514.79.5.827>
- Galambos, N. L., Almeida, D. M., & Petersen, A. C. (1990). Masculinity, femininity, and sex role attitudes in early adolescence: Exploring gender intensification. *Child Development*, 61(6), 1905-1914. <https://doi.org/10.2307/1130846>

- Ganzeboom, H. B. G., De Graaf, P. M., & Treiman, D. J. (1992). A standard international socio-economic index of occupational status. *Social Science Research*, 21(1), 1-56.
[https://doi.org/10.1016/0049-089X\(92\)90017-B](https://doi.org/10.1016/0049-089X(92)90017-B)
- Gerson, K. (2010). *The unfinished revolution: How a new generation is reshaping family, work, and gender in America*. Oxford University Press.
- Gottfredson, L. S. (2005). *Applying Gottfredson's Theory of Circumscription and Compromise in Career Guidance and Counseling*. In S. D. Brown & R. W. Lent (Eds.), *Career development and counseling: Putting theory and research to work* (p. 71–100). John Wiley & Sons, Inc.
- Guimond, S., Chatard, A., Martinot, D., Crisp, R., & Redersdorff, S. (2006). Social comparison, self-stereotyping, and gender differences in self-construals. *Journal of Personality and Social Psychology*, 90(2), 221-242. <https://doi.org/10.1037/0022-3514.90.2.221>
- Halim, M. L., & Ruble, D. N. (2010). Gender identity and stereotyping in early and middle childhood. In J. Chrisler & D. McCreary (Eds.), *Handbook of gender research in psychology* (pp. 495-525). Springer.
- Halim, M. L., Ruble, D. N., Tamis-LeMonda, C. S., Zosuls, K. M., Lurye, L. E., Greulich, F. K., & Eccles, J. S. (2014). Pink Frilly Dresses and the Avoidance of All Things "Girly": Children's Appearance Rigidity and Cognitive Theories of Gender Development. *Developmental Psychology*, 50(4), 1091-1101. <https://doi.org/10.1037/a0034906>
- Halim, M. L., Ruble, D. N., Tamis-LeMonda, C. S., Shrout, P. E., & Amodio, D. A. (2016). Gender Attitudes in Early Childhood: Behavioral Consequences and Cognitive Antecedents. *Child Development*, 88(3), 882-899. <https://doi.org/10.1111/cdev.12642>
- Halim, M., Walsh, A. S., Tamis-LeMonda, C. S., Zosuls, K. M., & Ruble, D. N. (2018). The Roles of Self-Socialization and Parent Socialization in Toddlers' Gender-Typed Appearance. *Archives of sexual behavior*, 47(8), 2277–2285. <https://doi.org/10.1007/s10508-018-1263-y>
- Hartley, B. L., & Sutton, R. M. (2013). A Stereotype Threat Account of Boys' Academic Underachievement. *Child Development*, 84(5), 1716–1733.
<https://doi.org/10.1111/cdev.12079>

- Heilman, M. E. (2012). Gender stereotypes and workplace bias. *Res. Organ. Behav*, 32, 113–135.
<https://doi.org/10.1016/j.riob.2012.11.003>
- Helgeson, V. S. (1994). Relation of agency and communion to well-being: Evidence and potential explanations. *Psychological Bulletin*, 116(3), 412–428. <https://doi.org/10.1037/0033-2909.116.3.412>
- Helgeson, V. S., & Palladino, D. K. (2012). Implications of psychosocial factors for diabetes outcomes among children with type 1 diabetes: A review. *Social and Personality Psychology Compass*, 6(3), 228–242. <https://doi.org/10.1111/j.1751-9004.2011.00421.x>
- Helgeson, V. S. (2015). *Gender and personality*. In M. Mikulincer, P. R. Shaver, L. M. Cooper, & R. J. Larsen (Eds.), *APA handbook of personality and social psychology (Personality processes and individual differences, Vol. 4, pp. 515–534)*. American Psychological Association. <https://doi.org/10.1037/14343-000>
- Herbert, J., & Stipek, D. (2005). The Emergence of Gender Differences in Children's Perceptions of Their Academic Competence. *Journal of Applied Developmental Psychology*, 26, 276–295. <https://doi.org/10.1016/j.appdev.2005.02.007>
- Heyder, A., & Kessels, U. (2013). Is School Feminine? Implicit Gender Stereotyping of School as a Predictor of Academic Achievement. *Sex Roles*, 69(11–12), 605–617.
<https://doi.org/10.1007/s11199-013-0309-9>
- Hill, J. P., & Lynch, M. E. (1983). The Intensification of Gender-Related Role Expectations during Early Adolescence. In J. Brooks-Gunn & A. C. Peterson (Eds.), *Girls at Puberty: Biological and Psychological Perspectives* (pp 201–228). Springer Science + Business Media.
- Hogg, M. A., & Turner, J. C. (1987). Intergroup behaviour, self-stereotyping and the salience of social categories. *British Journal of Social Psychology*, 26(4), 325–340. <https://doi.org/10.1111/j.2044-8309.1987.tb00795.x>
- Hyde, J. S. (2005). The gender similarities hypothesis. *American Psychologist*, 60(6), 581–592.
<https://doi.org/10.1037/0003-066X.60.6.581>

- IIEP-UNESCO (2020). COVID-19 school closures: Why girls are more at risk. Retrieved on April 4, 2021 from <http://www.iiep.unesco.org/en/covid-19-school-closures-why-girls-are-more-risk-13406>
- Jackson, L. A. (1985). Self-conceptions and gender role: The correspondence between gender-role categorization and open-ended self-descriptions. *Sex Roles*, 13(9), 549–566. <https://doi.org/10.1007/BF00287761>.
- Jacobs, J. E., Lanza, S., Osgood, D. W., Eccles, J. S., & Wigfield, A. (2002). Changes in children's self-competence and values: gender and domain differences across grades one through twelve. *Child development*, 73(2), 509–527. <https://doi.org/10.1111/1467-8624.00421>
- Kahneman, D. (1999). *Objective happiness*. In D. Kahneman, E. Diener, and N. Schwarz (Eds.), *Well-being: The foundations of hedonic psychology* (p. 3–25). Russell Sage Foundation.
- Kane, E. W. (2006). “No way my boys are going to be like that!”: Parents’ responses to children’s gender nonconformity. *Gender & Society*, 20(2), 149–176. <https://doi.org/10.1177/0891243205284276>
- Kauppinen K., & Aaltio I. (2003). *Leadership, Power, and Gender*. In: Ember C.R., Ember M. (eds) *Encyclopedia of Sex and Gender*. Springer. https://doi-org/10.1007/0-387-29907-6_10
- Kern, M. L., Waters, L. E., Adler, A., & White, M. A. (2015). A multidimensional approach to measuring well-being in students: Application of the PERMA framework. *The Journal of Positive Psychology*, 10(3), 262–271. <https://doi.org/10.1080/17439760.2014.936962>
- Kessels, U., Heyder, A., Latsch, M., & Hannover, B. (2014). How gender differences in academic engagement relate to students’ gender identity. *Educational Research*, 56(2), 220–229. <https://doi.org/10.1080/00131881.2014.898916>
- Klaczynski, P. A., Felmban, W. S., & Kole, J. (2020). Gender Intensification and Gender Generalization Biases in Pre-adolescents, Adolescents, and Emerging Adults. *British Journal of Developmental Psychology*, 38(3), 415–433. <https://doi.org/10.1111/bjdp.12326>
- Kohlberg, L. (1966). A cognitive-developmental analysis of children's sex-role concepts and attitudes. In E. E. Maccoby (Ed.), *The development of sex differences*. Stanford University Press.

- Kollmayer, M., Schober, B., & Spiel, C. (2018). Gender Stereotypes in Education: Development, Consequences, and Interventions. *European Journal of Developmental Psychology*, 15(4), 361-377. <https://doi.org/10.1080/17405629.2016.1193483>
- Kollmayer, M., Schultes, M.-T., Schober, B., Hodosi, T., Spiel, C., Weisgram, E. S., & Dinella, L. M. (2018a). Parents' Judgments about the Desirability of Toys for Their Children: Associations with Gender Role Attitudes, Gender-typing of Toys, and Demographics. *Sex Roles*, 79(5), 329-341. <https://doi.org/10.1007/s11199-017-0882-4>
- Latrofa, M., Vaes, J., Pastore, M., & Cadinu, M. (2009). United We Stand, Divided We Fall! The Protective Function of Self-Stereotyping for Stigmatised Members Psychological Well-Being. *Applied Psychology*, 58(1), 84-104. <https://doi.org/10.1111/j.1464-0597.2008.00383.x>
- Latrofa, M., Vaes, J., Cadinu, M., & Carnaghi, A. (2010). The Cognitive Representation of Self-Stereotyping. *Personality & Social Psychology Bulletin*, 36(7), 911-922. <https://doi.org/10.1177/0146167210373907>
- Lupart, J. L., Cannon, E., & Telfer, J. A. (2004). Gender differences in adolescent academic achievement, interests, values and life-role expectations. *High Ability Studies*, 15(1), 25-42. <https://doi-org/10.1080/1359813042000225320>
- Maccoby, E. E. (1988). Gender as a social category. *Developmental Psychology*, 24(6), 755-765. <https://doi.org/10.1037/0012-1649.24.6.755>
- Maddux, W. W., & Brewer, M. B. (2005). Gender Differences in the Relational and Collective Bases for Trust. *Group Processes & Intergroup Relations*, 8(2), 159-171. <https://doi.org/10.1177/1368430205051065>
- Markstrom-Adams, C. (1989). Androgyny and its relation to adolescent psychosocial well-being: A review of the literature. *Sex Roles: A Journal of Research*, 21(5-6), 325-340. <https://doi.org/10.1007/BF00289595>
- Martin, C. L., & Halverson, C. F. (1981). A schematic processing model of sex typing and stereotyping in children. *Child Development*, 52(4), 1119-1134. <https://doi.org/10.2307/1129498>

- Martin, L., Ruble, D. N., & Szkrybalo, J. (2002). Cognitive theories of early gender development. *Psychological Bulletin*, 128(6), 903-933. <https://doi.org/10.1037/0033-2909.128.6.903>.
- Martinez, M. A., Osornio, A., Halim, M. L. D., & Zosuls, K. M. (2019). Gender: Awareness, identity, and stereotyping. In Brownell, J. (Ed.), *Encyclopedia of Infant and Early Child Development* (2nd ed.) (pp. 1-12). Elsevier. <https://dx.doi.org/10.1016/B978-0-12-809324-5.21818-X>
- Massey, D.S., Fischer, M.J. (2005). Stereotype threat and academic performance: new findings from a racially diverse sample of freshman. *DuBois Rev*, 2(1), 45-67.
- McDowell, L. (2012). Post-crisis, post-Ford and post-gender? Youth identities in an era of austerity. *Journal of Youth Studies*, 15, 573– 590.
<https://doi.org/10.1080/13676261.2012.671933>
- McGuire, W. J., & Padawer-Singer, A. (1976). Trait salience in the spontaneous self-concept. *Journal of Personality and Social Psychology*, 33(6), 743–754. <https://doi.org/10.1037/0022-3514.33.6.743>
- McGuire, W. J., & McGuire, C. V. (1982). *Significant others in self-space: Sex differences and developmental trends in social self*. In J.Suls (Ed.), *Psychological perspectives on the self* (Vol. 1, pp. 71-96). Erlbaum.
- McGuire, W. J., & McGuire, C. V. (1988). Content and Process in the Experience of Self. In L. Berkowitz (Ed.), *Advances in Experimental Social Psychology* (Vol. 21, pp. 97–144).
[https://doi.org/10.1016/S0065-2601\(08\)60225-7](https://doi.org/10.1016/S0065-2601(08)60225-7)
- Mendez, L. M. R., & Crawford, K. M. (2002). Gender-Role Stereotyping and Career Aspirations: A Comparison of Gifted Early Adolescent Boys and Girls. *Journal of Secondary Gifted Education*, 13(3), 96–107. <https://doi.org/10.4219/jsge-2002-375>
- Morawska, A. (2020). The effects of gendered parenting on child development outcomes: A systematic review. *Clinical Child and Family Psychology Review*, 23(4), 553-576. <https://doi.org/10.1007/s10567-020-00321-5>

- Moss-Racusin, C. A., Phelan, J. E., & Rudman, L. A. (2010). When men break the gender rules: Status incongruity and backlash against modest men. *Psychology of Men & Masculinity*, 11(2), 140-151. <https://doi.org/10.1037/a0018093>
- Nefesh-Clarke, L., Orser, B., & Thomas, M. (2020). COVID-19 Response Strategies, Addressing Digital Gender Divides. Retrieved on April 4, 2021 from https://www.g20-insights.org/policy_briefs/covid-19-response-strategies-addressing-digital-gender-divides/
- Nielson, M.G., Schroeder, K.M., Martin, C.L., & Cook, R.E. (2020). Investigating the Relation between Gender Typicality and Pressure to Conform to Gender Norms. *Sex Roles*, 83, 523–535.
- Nosek, B. A., Banaji, M. R., & Greenwald, A. G. (2002). Harvesting implicit group attitudes and beliefs from a demonstration web site. *Group Dynamics: Theory, Research, and Practice*, 6(1), 101–115. <https://doi-org/10.1037/1089-2699.6.1.101>
- Nurmi, J. E. (2004). *Socialization and Self-development: Channeling, Selection, Adjustment, and Reflection*. In Handbook of Adolescent Psychology. 2nd ed, edited by R. Lerner, and L. Steinberg, 85–124. Wiley.
- OECD (2017). *The Pursuit of Gender Equality: An Uphill Battle*. OECD Publishing. <https://doi-org/10.1787/9789264281318-en>
- Ojanen, T., Grönroos, M., & Salmivalli, C. (2005). An Interpersonal Circumplex Model of Children's Social Goals: Links With Peer-Reported Behavior and Sociometric Status. *Developmental Psychology*, 41(5), 699-710. <https://doi.org/10.1037/0012-1649.41.5.699>
- Osborne, J.W. (2007). Linking Stereotype Threat and Anxiety. *Educational Psychology*, 27(1), 135-154, <https://doi.org/10.1080/01443410601069929>
- Pauletti, R. E., Menon, M., Cooper, P. J., Aults, C. D., & Perry, D. G. (2017). Psychological Androgyny and Children's Mental Health: A New Look with New Measures. *Sex Roles*, 76(11–12), 705–718. <https://doi.org/10.1007/s11199-016-0627-9>
- Pedhazur, E. J., & Tetenbaum, T. J. (1979). Bem Sex Role Inventory: A theoretical and methodological critique. *Journal of Personality and Social Psychology*, 37(6), 996-1016. <https://doi.org/10.1037/0022-3514.37.6.996>

- Pennington, C. R., Heim, D., Levy, A. R., & Larkin, D. T. (2016). Twenty Years of Stereotype Threat Research: A Review of Psychological Mediators. *PloS One*, *11*(1), e0146487. <https://doi.org/10.1371/journal.pone.0146487>
- Pickett, C. L., Bonner, B. L., & Coleman, J. M. (2002). Motivated self-stereotyping: Heightened assimilation and differentiation needs result in increased levels of positive and negative self-stereotyping. *Journal of Personality and Social Psychology*, *82*(4), 543-562. <https://doi.org/10.1037//0022-3514.82.4.543>
- Picho, K., Rodriguez, A., & Finnie, L. (2013). Exploring the moderating role of context on the mathematics performance of females under stereotype threat: A meta-analysis. *The Journal of Social Psychology*, *153*(3), 299-333. <https://doi.org/10.1080/00224545.2012.737380>
- Poulton, E. C. (1989). *Bias in quantifying judgments*. Lawrence Erlbaum Associates, Inc.
- Powlishta, K. K. (2004). *Gender as a social category: Intergroup processes and gender-role development*. In M. Bennett & F. Sani (Eds.), *The development of the social self* (pp. 103-133). Psychology Press. https://doi.org/10.4324/9780203391099_chapter_4
- Prentice, D. A., & Carranza, E. (2002). What women should be, shouldn't be, are allowed to be, and don't have to be: The contents of prescriptive gender stereotypes. *Psychology of Women Quarterly*, *26*(4), 269-281. <https://doi.org/10.1111/1471-6402.t01-1-00066>
- Price, L. (2006). Gender differences and similarities in online courses: Challenging stereotypical views of women. *Journal of Computer Assisted Learning*, *22*(5), 349-359. <https://doi.org/10.1111/j.1365-2729.2006.00181.x>
- Priess, H. A., Lindberg, S. M., & Hyde, J. S. (2009). Adolescent Gender-Role Identity and Mental Health: Gender Intensification Revisited. *Child Development*, *80*(5), 1531-1544. <https://doi.org/10.1111/j.1467-8624.2009.01349.x>
- Pyhältö, K., Soini, T., & Pietarinen, J. (2010). Pupils' pedagogical well-being in comprehensive school—significant positive and negative school experiences of Finnish ninth graders. *European Journal of Psychology of Education*, *25*(2), 207-221. <https://doi.org/10.1007/s10212-010-0013-x>

- Rani, D. (2018). Adolescents career aspirations, gender and socio-economic status. *Journal of Advances and Scholarly Researches in Allied Education*, 15(8), 37–46.
- Rosenthal, L., & Overstreet, N. (2016). Stereotyping. In H. S. Friedman (Ed.), *Encyclopedia of mental health* (2nd ed., pp. 318-329). Academic Press. <https://doi.org/10.1016/B978-0-12-397045-9.00164-6>
- Saragovi, C., Koestner, R., Di Dio, L., & Aubé, J. (1997). Agency, communion, and well-being: Extending Helgeson's (1994) model. *Journal of Personality and Social Psychology*, 73(3), 593–609. <https://doi.org/10.1037/0022-3514.73.3.593>
- Saragovi, C., Aubé, J., Koestner, R., & Zuroff, D. (2002). Traits, Motives, and Depressive Styles as Reflections of Agency and Communion. *Personality and Social Psychology Bulletin*, 28(5), 563–577. <https://doi.org/10.1177/0146167202288001>
- Schaffhuser, K., Allemand, M., & Schwarz, B. (2017). The Development of Self-Representations During the Transition to Early Adolescence: The Role of Gender, Puberty, and School Transition. *The Journal of early adolescence*, 37(6), 774-804. <https://doi.org/10.1177/0272431615624841>
- Schmader, T., & Johns, M. (2003). Converging evidence that stereotype threat reduces working memory capacity. *Journal of Personality and Social Psychology*, 85(3), 440–452. <https://doi-org/10.1037/0022-3514.85.3.440>
- Serbin, L. A., Poulin-Dubois, D., Colburne, K. A., Sen, M. G., & Eichstedt, J. A. (2001). Gender stereotyping in infancy: Visual preferences for and knowledge of gender-stereotyped toys in the second year. *International Journal of Behavioral Development*, 25, 7–15.
- Sheldon, K. M., & Cooper, M. L. (2008). Goal Striving Within Agentic and Communal Roles: Separate but Functionally Similar Pathways to Enhanced Well-Being. *Journal of Personality*, 76(3), 415–448. <https://doi.org/10.1111/j.1467-6494.2008.00491.x>
- Sczesny, S., Nater, C., & Eagly, A. H. (2019). Agency and communion: Their implications for gender stereotypes and gender identities. In A. Abele & B. Wojciszke (Eds.), *Agency and communion in social psychology* (pp. 103-116). Routledge.

- Sinclair, S., Hardin, C. D., & Lowery, B. S. (2006). Self-stereotyping in the context of multiple social identities. *Journal of Personality and Social Psychology*, 90(4), 529-542.
<https://doi.org/10.1037/0022-3514.90.4.529>
- Sirin, S. R., McCreary, D. R., & Mahalik, J. R. (2004). Differential reactions to men and women's gender role transgressions: Perceptions of social status, sexual orientation, and value dissimilarity. *The Journal of Men's Studies*, 12(2), 119-132. <https://doi.org/10.3149/jms.1202.119>
- Skinner, O. D., McHale, S. M., Wood, D., & Telfer, N. A. (2019). Gender-typed personality qualities and African American youth's school functioning. *Journal of Youth and Adolescence*, 48(4), 680-691. <https://doi.org/10.1007/s10964-018-0919-1>
- Spence, J. T., Helmreich, R., & Stapp, J. (1975). Ratings of self and peers on sex role attributes and their relation to self-esteem and conceptions of masculinity and femininity. *Journal of Personality and Social Psychology*, 32(1), 29-39. <https://doi.org/10.1037/h0076857>
- Steele, C. M., & Aronson, J. (1995). Stereotype threat and the intellectual test performance of African Americans. *Journal of Personality and Social Psychology*, 69(5), 797-811.
<https://doi.org/10.1037/0022-3514.69.5.797>
- Steele, C. M. (1997). A threat in the air: How stereotypes shape intellectual identity and performance. *American Psychologist*, 52(6), 613-629. <https://doi-org/10.1037/0003-066X.52.6.613>
- Su, R., Rounds, J., & Armstrong, P. I. (2009). Men and things, women and people: A meta-analysis of sex differences in interests. *Psychological Bulletin*, 135(6), 859-884.
<https://doi.org/10.1037/a0017364>
- Tajfel, H. & Turner, J.C. (1979). An integrative theory of intergroup conflict. In W.G. Austin & S. Worchel (Eds.), *The social psychology of intergroup relations* (pp. 33-47). Brooks/Cole.
- Tajfel, H., & Turner, J. C. (1986). The social identity theory of intergroup behavior. In G. L. Steven & W. G. Austin (Eds.), *The psychology of Intergroup Relations* (pp. 7-24). Nelson-Hall.

- Tisak, M. S., Tisak, J., & Laurene, K. R. (2012). Children's judgments of social interactive behaviors with peers: the influence of age and gender. *Social Psychology of Education, 15*(4), 555-570. <https://doi.org/10.1007/s11218-012-9194-2>
- Turner, J. C., & Oakes, P. J. (1986). The significance of the social identity concept for social psychology with reference to individualism, interactionism and social influence. *British Journal of Social Psychology, 25*(3), 237-252. <https://doi.org/10.1111/j.2044-8309.1986.tb00732.x>
- Turner, J. C., Hogg, M. A., Oakes, P. J., Reicher, S. D., & Wetherell, M. S. (1987). *Rediscovering the social group: A self-categorization theory*. Basil Blackwell.
- Uchronski, M. (2008). Agency and communion in spontaneous self-descriptions: Occurrence and situational malleability. *European Journal of Social Psychology, 38*(7), 1093–1102. <https://doi-org/10.1002/ejsp.56>
- Van Grootel, S., Van Laar, C., Meeussen, L., Schmader, T., & Sczesny, S. (2018). Uncovering pluralistic ignorance to change men's communal self-descriptions, attitudes, and behavioral intentions. *Frontiers in Psychology, 9*, 1-12. <https://doi.org/0.3389/fpsyg.2018.01344>
- Van Houtte, M. (2004). Why boys achieve less at school than girls: The difference between boys' and girls' academic culture. *Educational Studies, 30*(2), 159–173. <https://doi-org/10.1080/0305569032000159804>
- Watts, L. L., Frame, M. C., Moffett, R. G., Van Hein, J. L., & Hein, M. (2015). The Relationship between gender, perceived career barriers, and occupational aspirations. *Journal of Applied Physiology, 45*(1), 10–22. <https://doi.org/10.1111/jasp.12271>
- WEF (2017). The Global Gender Gap Report. Retrieved at April 4, 2021 from http://www3.weforum.org/docs/WEF_GGGR_2017.pdf
- Wegemer, C. M., & Eccles, J. S. (2019). Gendered STEM career choices: Altruistic values, beliefs, and identity. *Journal of Vocational Behavior, 110*(Part A), 28–42. <https://doi-org/10.1016/j.jvb.2018.10.020>
- WHO (2020). Adolescent mental health. Retrieved on April 4, 2021 from: <https://www.who.int/news-room/fact-sheets/detail/adolescent-mental-health>

- Wichstrøm, L. (1999). The emergence of gender difference in depressed mood during adolescence: The role of intensified gender socialization. *Developmental Psychology*, 35(1), 232-245. <https://doi.org/10.1037/0012-1649.35.1.232>
- Wicht, A. (2016). Occupational aspirations and ethnic school segregation: Social contagion effects among native German and immigrant youths. *Journal of Ethnic and Migration Studies*, 42(11), 1825–1845. <http://doi.org/10.1080/1369183X.2016.1149455>
- Wicht, A., Miyamoto, A., & Lechner, C. M. (2021). Are Girls More Ambitious Than Boys? Vocational Interests Partly Explain Gender Differences in Occupational Aspirations. *Journal of Career Development*, 1-18. <https://doi.org/10.1177/0894845321991665>
- Witt, M. G., & Wood, W. (2010). Self-regulation of gendered behavior in everyday life. *Sex Roles*, 62(9-10), 635-646. <https://doi.org/10.1007/s11199-010-9761-y>
- Whitley, B. E. (1983). Sex role orientation and self-esteem: A critical meta-analytic review. *Journal of Personality and Social Psychology*, 44(4), 765–778. <https://doi.org/10.1037/0022-3514.44.4.765>
- Whitley, B. E. (1985). Sex-role orientation and psychological well-being: Two meta-analyses. *Sex Roles*, 12(1–2), 207–225. <https://doi.org/10.1007/BF00288048>
- Yates, S. J. (2001). Gender, language and CMC for education. *Learning and Instruction*, 11, 21–34. [https://doi.org/10.1016/S0959-4752\(00\)00012-8](https://doi.org/10.1016/S0959-4752(00)00012-8)
- Yu, C., Zuo, X., Blum, R. W., Tolman, D. L., Kågesten, A., Mmari, K., De Meyer, S., Michielsens, K., Basu, S., Acharya, R., Lian, Q., & Lou, C. (2017). Marching to a Different Drummer: A Cross-Cultural Comparison of Young Adolescents Who Challenge Gender Norms. *The Journal of adolescent health: official publication of the Society for Adolescent Medicine*, 61(4S), S48–S54. <https://doi.org/10.1016/j.jadohealth.2017.07.005>

Publications of the dissertation

1st Publication: Korlat, S., Foerst, N., Schultes, M.-T., Schober, B., Spiel, C., & Kollmayer, M. (2021). Gender role identity and gender intensification: Agency and communion in adolescents' spontaneous self-descriptions. *European Journal of Developmental Psychology*. Advance online publication. <https://doi.org/10.1080/17405629.2020.1865143>

Contributions by the individual authors

Selma Korlat participated in the data preparation and categorization, conducted and interpreted data analyses and drafted the manuscript. Responsible for the revision process.

Nora Maria Foerst participated in the data preparation and categorization, coded data and contributed to the final version of the manuscript.

Marie-Therese Schultes participated in the design and coordination of the study, data categorization and contributed to the final version of the manuscript.

Barbara Schober and **Christiane Spiel** conceived the study design and contributed to the final version of the manuscript.

Marlene Kollmayer participated in the data categorization and coding process, supervised the manuscript preparation and contributed to the final version of the manuscript.

All authors read and approved the final manuscript.



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To cite this article: Selma Korlat , Nora Maria Foerst , Marie-Therese Schultes , Barbara Schober , Christiane Spiel & Marlene Kollmayer (2021): Gender role identity and gender intensification: Agency and communion in adolescents' spontaneous self-descriptions, European Journal of Developmental Psychology, DOI: [10.1080/17405629.2020.1865143](https://doi.org/10.1080/17405629.2020.1865143)

To link to this article: <https://doi.org/10.1080/17405629.2020.1865143>



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Gender role identity and gender intensification: Agency and communion in adolescents' spontaneous self-descriptions

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ABSTRACT

In line with gender stereotypes, girls are expected to take on communal roles and boys to take on agentic roles. Based on gender intensification theory, the present cross-sectional study investigated girls' and boys' gender role identity and corresponding age differences across adolescence using the spontaneous self-description method. In total, 3423 adolescents aged between 11 and 15 years were asked to describe themselves with three attributes later coded in terms of agency and communion. ANOVA results showed expected but small gender differences in agency and communion, and no evidence for gender intensification. Moreover, significant gender differences were found in only 17% of the named attributes. The results thus indicate greater gender similarities than gender differences in adolescents' self-descriptions.

ARTICLE HISTORY Received 24 March 2020; Accepted 13 December 2020

KEYWORDS Agency; communion; adolescents; gender role identity; stereotypes

Children learn about the social categories of gender from earliest infancy. Socializing agents (e.g., parents and teachers) convey which traits and behaviours are acceptable for girls and boys, shaping children's self-image and self-efficacy (Bussey & Bandura, 1999). In Western culture, boys are taught through everyday experiences to express independence, self-assertion and dominance, whereas girls learn to be caring, kind and focused on others (Helgeson, 1994; Kollmayer et al., 2018a). Whilst gender differences typically remain small in childhood, they seem to become more pronounced in adolescence (Retelsdorf et al., 2015). Adolescence is considered a crucial period for the adoption and intensification of gender-typical traits and behaviours due to increased socialization pressure to

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 Supplemental data for this article can be accessed [here](#).

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conform to traditional gender roles (Hill & Lynch, 1983). The outcomes of this developmental process impact one's psychological adjustment and health (Helgeson, 1994; Helgeson & Fritz, 1999). It has been repeatedly shown that differences in the extent to which individuals adopt stereotypically masculine and feminine traits in their self-concept impact their psychological well-being (Abele, 2014; Fournier & Moskowitz, 2000; Helgeson, 1994; Saragovi et al., 2002; Sheldon & Cooper, 2008). Moreover, adolescence is a critical period for shaping educational and career choices, which are significantly influenced by gender self-stereotyping in this period of life (Gottfredson, 2002). Despite its importance for adolescents' present and future opportunities, adaptation and overall psychological functioning, studies examining gender self-stereotyping and its intensification in adolescence are scarce. Moreover, existing studies have been criticized for relying solely on predetermined attribute lists such as the Bem Sex Role Inventory (BSRI; Bem, 1974) to assess the extent to which individuals describe themselves in stereotypically gendered ways – an approach that may not capture the most salient aspects of a person's self-concept. Therefore, the aim of this study is to test the gender intensification hypothesis by investigating adolescents' spontaneous self-descriptions.

Agency and communion

Bakan (1966) identified two primary motives in human existence: On the one hand, striving for individuality by differentiating oneself from others; on the other hand, seeking social integration and a sense of belonging. These two fundamental motives are conceptualized as agency and communion – two dimensions of social cognition upon which individuals evaluate and describe themselves, sometimes referred to as the "Big Two" (Abele et al., 2016). These basic dimensions also capture the distinction between instrumental and expressive attributes originally noted in the domain of gender roles (Bem, 1974; Spence et al., 1975). Communion-oriented individuals describe themselves in expressive terms by referring to their relationships with others and their sense of belonging, while agency-oriented individuals describe themselves instrumentally in view of their individual accomplishments and capabilities (Abele et al., 2016; Bakan, 1966; Diehl et al., 2004). Recent research has demonstrated that agency and communion further subdivide into different facets, with agency composed of assertiveness and competence and communion

composed of warmth and morality (Abele & Hauke, 2019). However, agency and communion are more than just dimensions of people's self-descriptions – they also have implications for social functioning, health, and well-being (Helgeson, 1994). For example, agency is positively correlated with self-esteem (Abele et al., 2008a; Gebauer et al., 2013; Wojciszke et al., 2011), mastery- and achievement-related goals (Pöhlmann, 2001), life satisfaction (Saragovi et al., 2002), and psychological well-being (Helgeson, 1994). Communion is positively associated with secure attachment styles (Bartz & Lydon, 2004), affiliation, intimacy-related goals (Pöhlmann, 2001) and relationship well-being (Le et al., 2018). In general, communal individuals tend to experience personal and relational benefits, while agentic individuals experience autonomy and achievement-related benefits (Abele et al., 2016).

While there is overlap between women and men in these traits (Ruble et al., 2006), studies have shown that, on average, men are more likely to describe themselves using agentic attributes, such as dominant and competitive, whereas women tend to describe themselves using communal terms, such as dependent and sociable (Helgeson & Palladino, 2012; Siegler et al., 1979). This difference in self-construals and self-descriptions is in line with societal gender stereotypes (Deaux & LaFrance, 1998; Eagly et al., 2000), with agency related to the masculine stereotype and communion related to the feminine one (Abele & Wojciszke, 2007; Bem, 1974; Eagly, 1987; Spence et al., 1975). While the equating of stereotypical masculinity and femininity with agency/instrumentality and communion/expressiveness has been questioned and criticized (e.g., Pedhazur & Totenbaum, 1979), new evidence confirms this notion. In a study by Abele and Wojciszke (2007), 300 attributes were evaluated according to the degree to which they expressed competence versus morality, individualism versus collectivism, agency versus communion, and masculinity versus femininity. The results of a principal component analysis yielded a clear two-factorial solution, with agency representing the common core of dimensions like individualism, competence, intellectual functioning, and masculinity, and communion representing the common core of dimensions like collectivism, morality, social functioning and femininity (Abele & Wojciszke, 2007). Therefore, the concepts of agency and communion can be equated with the concepts of psychological masculinity and femininity on an operational level.

A great deal of research conducted in Western nations indicates that women and men are socialized to act in accordance with stereotypical gender roles: Females are encouraged to be nurturing and socially

connected, whereas males are encouraged to be independent and autonomous (Helgeson, 1994; Klaczynski et al., 2020; Martinez et al., 2019). In a recent systematic review of gendered parenting in US, Canada, Australia and Western Europe, it has been shown that parents respond differently to daughters and sons (Morawska, 2020). For example, parents use more emotional expressions with daughters (Fivush et al., 2000), but more power assertion and physical control with sons (Endendijk et al., 2013; for a systematic review see Morawska, 2020). Similarly, parents in Western societies prefer gender-typed toys for their children, with stereotypically feminine toys related to nurturance and care and stereotypically masculine toys related to aggression and action (Blakemore & Centers, 2005; Kollmayer et al., 2018a). Thus, the gendered self-concepts and self-descriptions of women and men may reflect characteristics that have been built through socialization mirroring societal expectations for men and women (Athenstaedt, 2003; Eagly et al., 2000; Klaczynski et al., 2020; Martinez et al., 2019).

However, gender differences in agentic traits have decreased over time, leading to a narrower gender gap (Ebert et al., 2014; Wilde & Diekman, 2005). This shift seems to be unilateral: Whilst women have been shown to include more agentic attributes in their self-descriptions, there seems to be no increase in men's communion (Donnelly & Twenge, 2017; Kite et al., 2008; Twenge, 1997). This shift reflects changes in society: With women's increased participation in the labour force, women have been encouraged and even required to develop and adopt agentic traits and behaviours (Donnelly & Twenge, 2017; Eagly et al., 2000). On the other hand, numerous studies have found that parents and peers are likely to disapprove of gender role violations in boys (e.g., Kane, 2006; Sirin et al., 2004), indicating little acceptance for men taking on communal traits and behaviour (Priess et al., 2009). Thus, the lack of change in men's self-descriptions may be due to social repercussions for men who display communal traits, such as being viewed as weak, less likable and even less hireable (Moss-Racusin et al., 2010; Van Grootel et al., 2018).

Gender role identity in adolescence

Although it has been shown that children reach peak rigidity in their endorsement of gender-stereotypical beliefs and attitudes in early childhood (by age 5–6) (Blakemore, 2003; Halim & Ruble, 2010), self-concepts seem to become increasingly gendered in adolescence. Studies

repeatedly show that, on average, adolescent girls report a more communal self-concept and endorse more communal goals than adolescent boys, whereas boys report a relatively agentic self-concept and pursue more agentic goals than girls (Block et al., 2018; Klaczynski et al., 2020; Ojanen et al., 2005; Skinner et al., 2019). According to *gender intensification theory* (Hill & Lynch, 1983), girls and boys develop increasingly differentiated gender role identities and behaviours across early adolescence due to increased pressure to conform to stereotypical gender roles. Alongside physical changes in adolescence, these conformity pressures may lead adolescents to adopt a more gendered self-concept as part of their identity, while cognitive development and gender-related experiences weaken their stereotypical beliefs and attitudes towards others (Klaczynski et al., 2020). However, studies investigating the intensification of gender role identities in adolescence have yielded heterogeneous results. In a longitudinal study with 6th, 7th and 8th graders, Galambos et al. (1990) reported that 6th grade boys were more likely than girls to endorse agentic items and 6th grade girls more likely than boys to endorse communal items on the BSRI. While gender differences in agency increased across 7th and 8th graders, gender differences in communion did not, providing insufficient evidence for intensification regarding communion across early adolescence. Another cross-sectional study with children used the Children's Sex Role Inventory (CSRI) and found evidence for gender intensification regarding communion but not agency (Boldizar, 1991). Wichstrøm (1999) found boys to endorse agentic traits slightly more and girls to score higher in communion, with no evidence for an intensification of these gender differences. Priess et al. (2009) did not find gender differences in agency and also no support for an intensification of gender role identity with respect to either agency or communion. Similarly, Block et al. (2018) found evidence that gender differences in self-perceived agency and communion were stable between the ages of 6 and 14 years. On the other hand, a new study with adolescents in the US showed results generally consistent with the gender identification hypothesis. Twelve and 15-year-old boys adopted more masculine characteristics than 9-year-old boys, whereas 15-year-old but not 12-year-old girls adopted more feminine characteristics than 9-year-old girls (Klaczynski et al., 2020).

All of the aforementioned studies rely on a quantitative measurement approach, using the BSRI (Bem, 1974) or similar sex role inventories (e.g., the CSRI; Boldizar, 1991). Scholars have raised the important issue of

whether self-ratings on sex role inventories reflect salient dimensions of the self (see Myers & Gonda, 1982). One main critique is that gender-typed self-descriptions are highly dependent on the format used to elicit self-ratings. Predetermined attributes could function as cues for participants' memory search and thus influence their answers, making certain attributes more salient – including attributes participants would not normally perceive as relevant for their self-description (Brinthaupt & Erwin, 1992; Cowan & Stewart, 1977; McGuire & McGuire, 1988). Scholars have argued that gender role identity 'must be defined in terms of the individual rather than [be bound to] an experimenter-imposed construction' (Blanchard-Fields et al., 1994, p. 452). Scholars also argue that using classic sex role inventories represents a limitation of studies investigating gender intensification, since other measures might be useful for examining how individuals differ in their gender role identity (Priess et al., 2009).

An alternative approach to measuring self-stereotyping regarding agency and communion is the spontaneous self-description method (McGuire & Padawer-Singer, 1976). The primary idea underlying this method is that instead of presenting participants with predetermined dimensions, they are allowed to openly name attributes that are salient and significant to them, unfiltered by researchers' pre-selection of attributes. Hence, participants describe themselves in their own words, and indices of agency and communion are derived afterwards. Existing findings on gender self-stereotyping using the spontaneous self-description method are heterogeneous. Some studies have confirmed the stereotypical gender gaps in agency and communion (Diehl et al., 2004), whereas others have found that women and men did not describe themselves in a stereotypical manner when an open-ended answering format was applied (Cowan & Stewart, 1977; Jackson, 1985; Uchronski, 2008; Wise & Joy, 1982). In one of the rare studies using an open-ended format with adolescents, McGuire and McGuire (1982) found that girls' self-conceptions were more communal than boys'. However, these authors did not examine the intensification of gender differences.

Present study

The purpose of the present research is to examine gender intensification in adolescents' gender role identities by applying the spontaneous self-description method. The present study investigates gender differences and gender intensification in adolescents at two levels.

First, at the individual level, we examine whether adolescents self-stereotype themselves with respect to agency and communion and whether older adolescents have more stereotypical gender role identities than younger adolescents. In accordance with studies indicating a narrower gender gap for agency than communion (Priess et al., 2009; Wichstrøm, 1999), we expect girls to name more communal attributes in their self-descriptions than boys and boys to name more agentic attributes in their self-descriptions than girls, but gender differences should be smaller for agency than for communion. Moreover, we expect the difference between agency and communion to be larger in boys' than in girls' self-descriptions. Regarding the intensification of gender role identity in adolescence, we do not have a directed hypothesis, since prior studies have yielded inconsistent results.

Second, at the attribute level, we investigate gender differences in the individual attributes adolescents use in their spontaneous self-descriptions. One strength of the spontaneous self-description method is the possibility to examine gender differences in the specific attributes that spontaneously come to girls' and boys' minds when describing themselves. We expect the attributes named more frequently by girls to be communal ones and the attributes named more frequently by boys to be agentic ones.

Methods

Participants

The study sample consisted of 3423 adolescents (1706 girls, $M_{\text{age}} = 12.41$, $SD_{\text{age}} = 0.99$; 1717 boys, $M_{\text{age}} = 12.52$, $SD_{\text{age}} = 1.02$, age-range 11–15) from Austrian lower secondary schools predominantly attended by children from middle SES families. The students were 6th ($n = 969$, $M_{\text{age}} = 11.37$, $SD_{\text{age}} = .580$), 7th ($n = 1180$, $M_{\text{age}} = 12.36$, $SD_{\text{age}} = .580$) and 8th ($n = 1274$, $M_{\text{age}} = 13.40$, $SD_{\text{age}} = .603$) graders. Among participants, 68.3% do not have a migration background, while 6.8% are first-generation immigrants, 15.2% are second-generation immigrants and 9.7% have a partial migration background, with one parent born in a foreign country. Precisely, among participants, 91.6% were born in Austria, 0.9% in Turkey, 0.7% in Germany, 0.6% in Serbia or Montenegro, 0.4% in Bosnia and Herzegovina, 0.2% in Poland, 0.2% in North Macedonia, 0.1% in Croatia, 0.1% in Slovakia and 5.1% in other countries (the remaining 1% of participants chose the option 'I do not know' concerning their place of birth). In general, the

participants are ethnically representative of Austrian students (Statistics Austria, 2015). Due to the heterogeneous ethnicity of the sample, adolescents' migration background was included as a control variable in the analysis testing the gender intensification hypothesis.

Procedure

The data was collected in 2011 in Vienna, Austria, as part of the REFLECT programme, a secondary school teacher training program funded by five Austrian federal ministries (see Kollmayer et al., 2019, 2020; Schultes et al., 2015). Teachers were recruited via phone and email and voluntarily participated in the data collection with their classes. The participating students answered an online questionnaire via Unipark (Questback GmbH, 2016) during one school lesson. Written informed consent for students' participation was obtained from their parents in advance, and students could decide for themselves whether they wanted to participate in the data collection. Anonymity and confidentiality of their data were guaranteed.

Measures

At the beginning of the online survey, participants were asked to describe themselves as follows: 'How would you describe yourself to someone who you do not know yet? Please write down three attributes that describe you best. Please do not describe how you look but describe your personality (an example attribute: honest).' Participants described themselves in an open-ended format by writing down three attributes. The remaining questionnaire included items on demographics and various other topics such as motivation, class climate, and attitudes towards particular occupations. The present study is based solely on the spontaneous self-description item.

Data preparation

First, all misspelled attributes were corrected. We deleted non-existing words (e.g., 'ihjh', <1%) and negations (e.g., 'not bad') as well as attributes with certain adverbs of degree (e.g., 'somewhat' or 'slightly' in front of an adjective; 2.5% of statements), as their meaning was made ambiguous and therefore uncodable. Similarly, the attribute 'geil' was deleted as this

word has several meanings in adolescent slang in Austria (0.07%). When adverbs of degree did not change the meaning of the attribute, only the adverbs were deleted (e.g., 'very bad', 'quite bad' were corrected to 'bad'; 1% of statements). We included only the first three named attributes in further analyses. When participants wrote down phrases or short sentences to describe themselves (<1% of statements), two researchers synthesized them into one corresponding adjective or category (e.g., 'love to help' and 'for me it is important to help' were replaced with 'helpful'). All descriptions of one's outer appearance (e.g., 'I have brown hair', 'I wear glasses', etc.) were deleted from the dataset, as participants were specifically instructed to describe their personality and not their physical appearance (1.8% of statements). Participants who reported statements related to their interest in video games or TV (e.g., 'I like to watch TV', 'Fan of Need for Speed', etc.) were categorized into 'TV and games', and those who reported phrases related to computers (e.g., 'Computer freak' or 'I like computers', etc.) were grouped into the category 'computers'. Similarly, the category 'food' comprised self-descriptions related to food (e.g., 'I like pizza', 'I eat fast food'). Attributes reflecting negative attitudes towards school or poor school performance were categorized as 'not good in school' (e.g., 'I am not so good in school', 'I hate homework'). In contrast, the category 'good in school' comprised statements related to good performance in school or in a specific school subject. Statements related to soccer (e.g., 'I like to play soccer', 'I am a good soccer player', etc.) formed the category 'soccer', while those related to other sports (e.g., 'I play tennis', 'I like climbing', etc.) were merged into the category 'other sports'. A complete list of all categories including example statements can be found in the supplementary information (Supplementary file 1, Table 1). In a final step, the first, second, third and last author merged attributes and attribute categories when they were actually synonyms (e.g., 'talkative' was merged with 'communicative').

Coding of agency and communion

Once data preparation was completed, the second and last author independently coded all 247 attributes in terms of agency and communion. To rate the attributes as either agentic or communal, the coders relied on a definition and list of agentic and communal words used in a previous study on spontaneous self-representation in adults (see Appendices A and B in Diehl et al., 2004). Attributes that could not be coded as either

agentic or communal were coded as neutral. The coders were blind to participants’ gender. The raters achieved substantial inter-coder agreement ($\kappa = 0.65$; Landis & Koch, 1977). In a final step, the coders discussed all equivocal attributes and agreed on the final coding for each attribute.

Results

Descriptive analysis

Participants in both groups named a total of 9840 attributes in their self-descriptions. Of these, 50.4% of statements were made by girls (4963 attributes) and 49.6% were made by boys (4877 attributes). On average, students named 2.88 attributes. Following data preparation, 247 different attributes were included in the analyses. The complete list of attributes can be found in the supplementary information (Supplementary file 1, Table 2). Out of the 247 attributes listed, 30.8% (76) were coded as agentic, 29.1% (72) were coded as communal, and 40.1% (99) were coded as neutral. The most frequently named attributes by girls and boys (>1%) and their respective codes are presented in Table 1.

Individual level: Self-stereotyping and gender intensification

To explore gender differences and gender intensification in self-stereotyping regarding agency and communion, we conducted three separate analyses of variance (ANOVA) with gender, age and migration background as between-

Table 1. Absolute and relative frequencies of attributes named by girls and boys (> 1%).

Girls			Boys		
Attribute	Frequency	Relative frequency	Attribute	Frequency	Relative frequency
Nice (c)	702	14.1%	Nice (c)	681	14.0%
Helpful (c)	684	13.8%	Funny (n)	643	13.2%
Funny (n)	611	12.3%	Honest (c)	493	10.1%
Honest (c)	565	11.4%	Helpful (c)	446	9.1%
Friendly (c)	344	6.9%	Sporty (a)	317	6.5%
Cheerful (c)	130	2.6%	Friendly (c)	258	5.3%
Sporty (a)	125	2.5%	Intelligent (a)	171	3.5%
Crazy (n)	106	2.1%	Cool (n)	133	2.7%
Polite (c)	101	2.0%	Polite (c)	91	1.9%
Intelligent (a)	77	1.6%	Cheerful (c)	70	1.4%
Animal-loving (c)	70	1.4%			
Shy (c)	66	1.3%			
Creative (a)	56	1.1%			
Kind (c)	52	1.0%			

Code abbreviations: (a) – agency, (c) – communion, (n) – neutral. Relative frequency is the percentage of participants in the respective sub-sample who named each attribute.

subject factors. Number of agentic and communal words named served as the dependent variables. In addition, the difference between the number of agentic and communal words named by boys and girls in their self-descriptions was calculated. Positive scores in this calculation (ranging from 1 to 3) indicate a predominance of agentic attributes over communal attributes in one’s self-description. Negative scores (range –1 to –3) indicate a predominance of communal attributes over agentic attributes, while scores of zero represent a balanced use of agentic and communal attributes in one’s self-description.

Agency

Table 2 presents the means and standard deviations of named agentic attributes by gender and age. The results showed a significant main effect of gender, $F(1, 3383) = 5.60, p < .05, \eta^2_p = .002, d = .23, CI [.02, .21]$, with boys ($M = 0.51, SD = 0.68$) naming more agentic words than girls ($M = 0.36, SD = 0.60$). There were no significant main effects of age, $F(4, 3383) < 1, p > .05$, or migration background, $F(3, 3383) = 2.22, p > .05$. All interaction effects were also non-significant, all $ps > .05$.

Communion

The means and standard deviations for communion by gender and age are also presented in Table 2. The univariate ANOVA showed a significant main effect of gender, $F(1, 3383) = 32.19, p < .001$,

Table 2. Means and standard deviations for agency, communion and difference between agentic and communal attributes named by gender and age.

Age	Boys			Girls		
	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>
Agency						
11	316	.484	.639	354	.316	.539
12	517	.489	.687	556	.362	.610
13	593	.528	.690	568	.389	.622
14	254	.532	.698	201	.363	.642
15	37	.351	.484	27	.333	.679
Communion						
11	316	1.399	.956	354	1.836	.904
12	517	1.486	.918	556	1.820	.888
13	593	1.504	.919	568	1.933	.874
14	254	1.532	.914	201	2.065	.895
15	37	1.541	.960	27	2.185	.962
Difference						
11	316	–.915	1.383	354	–1.520	1.278
12	517	–.996	1.370	556	–1.459	1.308
13	593	–.976	1.396	568	–1.544	1.338
14	254	–1.000	1.383	201	–1.702	1.386
15	37	–1.189	1.244	27	–1.852	1.512

$\eta^2_p = .009$, $d = .46$, CI [.25, .51], with girls ($M = 1.90$, $SD = 0.89$) naming more communal words than boys ($M = 1.48$, $SD = 0.93$). There was also a significant main effect of age, $F(4, 33383) = 4.71$, $p < .001$, $\eta^2_p = .006$, indicating an increase in communion in older adolescents. Post hoc tests showed that adolescents aged 14 ($M = 1.77$, $SD = .94$) describe themselves as more communal than adolescents aged 11 ($M = 1.63$, $SD = .95$), $d = .15$, CI [.01, .46], and 12 ($M = 1.66$, $SD = .92$), $d = .12$, CI [.03, .40]. The mean differences between other age groups were not significant. The results showed a significant effect of migration background, $F(3, 3383) = 3.93$, $p < .03$, $\eta^2_p = .003$. Post-hoc tests showed significant differences between second-generation immigrants and students with no migration background, with second-generation immigrants ($M = 1.77$, $SD = .93$) describing themselves as more communal than adolescents without a migration background ($M = 1.67$, $SD = .92$), $d = .11$, CI [.03, .46]. Neither two-way nor three-way interactions between factors were significant, all $ps > .05$.

Difference between agentic and communal attributes

The means and standard deviations for the difference between agency and communion by gender and age can be found in [Table 2](#). The univariate ANOVA showed a significant effect of gender, $F(1, 3383) = 24.30$, $p < .001$, $\eta^2_p = .007$, $d = .41$, CI [.30, .69]. The results indicated a predominance of communal over agentic words in both genders, with girls ($M = -1.53$, $SD = 1.33$) naming even more communal than agentic words in their self-descriptions compared to boys ($M = -0.98$, $SD = 1.38$). The results also showed a significant effect of age, $F(4, 3383) = 2.57$, $p < .05$, $\eta^2_p = .003$. Post-hoc tests showed a stronger predominance of communal over agentic attributes among older adolescents (aged 13 ($M = -1.25$, $SD = 1.40$), $d = .01$, CI [.01, .36], 14 ($M = -1.31$, $SD = 1.43$), $d = .05$, CI [.03, .43], and 15 ($M = -1.47$, $SD = 1.39$), $d = .17$, CI [.01, .84]) compared to adolescents aged 12 ($M = -1.24$, $SD = 1.36$). Mean differences between other age groups were not significant. The main effect of migration background was also significant, $F(3, 3383) = 3.94$, $p < .01$, $\eta^2_p = .003$. Post-hoc tests revealed a stronger predominance of communal over agentic words in self-descriptions of adolescents who are first-generation ($M = -1.46$, $SD = 1.33$), $d = .18$, CI [.10, .56] and second-generation ($M = -1.39$, $SD = 1.36$), $d = .12$, CI [.09, .57] immigrants compared to adolescents without a migration background ($M = -1.22$, $SD = 1.39$). All interaction effects between factors were insignificant, all $ps > .05$.

Attribute level: Gender differences in named attributes

Configural frequency analysis (CFA; cf. Lienert, 1969; Von Eye, 1990) was used to analyse gender differences at the attribute level. This multivariate approach allows for analysing cross-classified, categorical data used in person-oriented developmental research (Von Eye et al., 2008). We applied a two-sample CFA to identify gender differences in single attributes named in adolescents' spontaneous self-descriptions. This type of CFA allows researchers to compare two independent groups of individuals and identify discrimination types, that is, attributes with higher frequencies in one group than would be expected from the base model (and thus fewer cases than expected in the other group), referred to as types and antitypes. Thus, the CFA is an exploratory analysis whose goal is to identify stand-out cells rather than confirm an existing model (Von Eye et al., 2008). The analysis was carried out using the CFA program developed by Von Eye (2000). Only attributes that were named more than 10 times were included in the analysis. For 86 attributes that met this criteria significance of the overall model (sampling distribution) was assessed with a χ^2 -test, followed by the identification of potential types and antitypes with Bonferroni-adjusted alpha significance tests.

As can be seen in Table 3, significant gender differences were found in 15 out of 86 attributes, and thus in only 17.4% of the attributes named more than 10 times. The results of the CFA showed that significantly more girls than boys spontaneously described themselves as 'helpful', 'cheerful', 'crazy', 'animal-loving', 'sensitive' and 'communicative'. Five of these attributes were communal, while one was neutral. Conversely, significantly more boys than girls included the following attributes in their self-descriptions: 'sporty', 'intelligent', 'cool', 'strong', 'computers' and 'not good in school'. In addition, more boys than girls described themselves using terms related to 'soccer', 'TV and games' and 'food'. Of these attributes, three were agentic and six were neutral.

Discussion

Gender intensification theory posits that, due to social pressure, adolescents develop increasingly differentiated gender role identities (Hill & Lynch, 1983). The central goal of the present study was to examine gender role identity and gender intensification in adolescents by applying the spontaneous self-description method. Our first research question addressed whether boys and girls self-stereotype themselves, and

Table 3. Frequencies of boys and girls naming attributes for which significant differences were found.

Attributes named more frequently by boys				
Attribute	Boys (f)	Girls (f)	χ^2^*	w
Sporty (a)	317	125	93.623	.46
Cool (n)	133	24	79.377	.71
Intelligent (a)	171	77	39.168	.40
Soccer (n)	37	2	30.951	.89
Computers (n)	22	1	18.130	.89
Food (n)	22	1	18.130	.89
TV and games (n)	24	2	17.740	.83
Strong (a)	32	6	17.387	.68
Not good in school (n)	19	1	15.073	.87
Attributes named more frequently by girls				
Attribute	Boys (f)	Girls (f)	χ^2^*	w
Helpful (c)	446	684	47.710	.21
Crazy (n)	30	106	39.423	.54
Animal-loving (c)	13	70	36.227	.66
Sensitive (c)	7	38	19.086	.65
Cheerful (c)	70	130	15.791	.28
Communicative (c)	1	17	12.020	.82

Code abbreviations: (a) – agency, (c) – communion, (n) – neutral, * all *ps* < 0.01, Cohen’s *w* – index of effect size for the goodness of fit test.

whether they become more stereotypical in their gender role identities with respect to agency and communion over the course of adolescence. Our results show that girls used more communal words in their self-descriptions than boys, while boys used more agentic terms in their self-descriptions than girls. These findings are consistent with previous studies showing stereotypical gender differences in agency and communion (Block et al., 2018; Klaczynski et al., 2020; Ojanen et al., 2005; Priess et al., 2009; Skinner et al., 2019; Wichstrøm, 1999). Thus, one could argue that adolescents still describe themselves in stereotypically gendered ways when they are allowed to choose the dimensions that are salient and significant to them. However, the effect sizes for gender differences in both agency and communion are moderate to small, and even smaller for agency than for communion. These findings are in line with Hyde’s (2005) gender similarities hypothesis, which states that, in terms of effect sizes, most psychological gender differences are small or close to zero. Moreover, smaller effect sizes for agency than for communion might to some extent indicate a narrowing of the gender gap in agency, as shown in previous studies (Priess et al., 2009; Wichstrøm, 1999). Similarly, our results confirm our expectation that the difference between agentic and communal words will be larger in boys’ than in girls’ self-descriptions. However, even boys, on average, included more communal than agentic attributes in their self-descriptions. Moreover, their average

difference score was closer to zero than to a positive number, indicating a balanced use of agentic and communal attributes in boys' self-descriptions rather than a clear predominance of agentic attributes over communal attributes. This might indicate a narrowing of the gender gap for communion as well. Younger generations of boys may feel more free to adopt communal attributes in their self-descriptions, despite stronger disapproval of gender role violations in boys (e.g., Kane, 2006; Sirin et al., 2004), as well as higher gender conformity pressure among boys than girls reported in previous studies (Egan & Perry, 2001; Nielson et al., 2020).

Although previous studies suggested that the importance of agency might increase across adolescence (e.g., Chen et al., 2018), our results did not support this notion, instead showing equal endorsement of agentic attributes in self-descriptions by adolescents of all ages. One explanation for this finding could be that instrumental traits and behaviours are uniformly fostered from early to middle adolescence. In contrast, communal attributes were named more often in students' self-descriptions at age 14 than at the onset of adolescence (age 11 and 12). Supporting these findings, the predominance of communal over agentic attributes in self-descriptions was stronger among older (13-, 14- and 15-year-old) compared to younger (12-year-old) adolescents. This is not surprising given the social focus of adolescents' lives. Individuals with communal traits are more likely to form friendships or relationships with others and are more liked by peers (Chen et al., 2018) and teachers (Heyder & Kessels, 2013). Moreover, communion has been shown to predict positive school functioning and self-esteem for both boys and girls (Skinner et al., 2019), as well as positive school outcomes (Hoffman et al., 2004). Thus, greater endorsement of communal traits as adolescence proceeds is in line with the increasing importance of peers and social relationships during this period of life (Brown & Larson, 2009; Ryan, 2001), as well as with the school context, which is a major life domain in adolescence (Eccles & Roeser, 2011; Tian et al., 2014). The general prevalence of communion over agency in participants' answers is in line with other studies of adolescents (McCabe & Dinh, 2016; Ojanen et al., 2005), and indicates a higher importance of communion during this period than later in life (Chen et al., 2018; Gebauer et al., 2013).

Our findings failed to confirm the gender intensification hypothesis, as there was no significant interaction effect of gender and age; rather, agency and communion seem to increase in parallel fashion in both boys and girls from age 11 to 15 (cf. Block et al., 2018; Priess et al., 2009;

Wichstrøm, 1999). One possible explanation for this result is that adolescents have become more comfortable defining and describing themselves with both agentic and communal attributes (Priess et al., 2009). That is not surprising given the aforementioned benefits of communion in school and social life, but also the importance of agentic traits for success in society in general (Abele et al., 2016). Gender roles may be changing, and younger generations of adolescents may not experience the same socialization pressures to conform to stereotypical gender roles, at least up until age 15. On the other hand, it is possible that social pressures to conform with stereotypical gender roles still exist, but newer generations of men and women are more aware of gender stereotypes and more reluctant to engage in gender roles, traits and behaviours (Helgeson, 2015), consequently deliberately disassociating themselves from characteristics linked to traditional conceptions of masculinity and femininity (Donnelly & Twenge, 2017). The interaction effects of migration background, gender and age were insignificant for both agency and communion as well as the difference between them, indicating the invariability of the results depending on adolescents' migration background. However, results showed a higher use of communal over agentic words in self-descriptions of adolescents who are first- and second-generation immigrants compared to adolescents without any migration background. This could potentially be explained by cultural influences, as adolescents with migration background mainly come from cultures that are more collectivistic, where communal traits are more valued and emphasized.

When examining gender differences in single attributes relevant for girls' and boys' self-descriptions, we found significant gender differences in only 15 out of 86 attributes named more than 10 times, indicating that 82.6% of attributes are named equally often by boys and girls. None of the attributes named more often by girls were agentic, and boys did not outnumber girls in the frequency of any communal attribute named. However, a small degree of gender differences supports the assumption that the similarities between genders in adolescents' self-descriptions are greater than the differences, which again supports Hyde's (2005) gender similarities hypothesis. Even though girls' self-descriptions included attributes referring to their relationships with other people (e.g., helpful, sensitive, communicative) or other living beings (e.g., animals), and boys described themselves more individualistically (e.g., cool, intelligent) or in relation to objects and interests more frequently than girls did, one cannot ignore the fact that gender differences emerged in only 17.4%

of the named attributes. Moreover, more than one-third of the attributes named by adolescents in our study were neutral, indicating that adolescent boys and girls not only describe themselves similarly (Wise & Joy, 1982), but also in a not particularly stereotypical way when an open-ended format is used (Cowan & Stewart, 1977; Jackson, 1985). This pattern is in line with a recent meta-analysis showing declines in the use of expressive and instrumental traits in students' self-descriptions (Donnelly & Twenge, 2017). The authors argue that these trends could indicate a movement towards a post-gender culture (Donnelly & Twenge, 2017; Gerson, 2010; McDowell, 2012).

Some of the interests mentioned more often by boys were coded as neutral rather than agentic, even though they may be seen as stereotypically masculine. In Europe, soccer is a typical boys' sport (Chalabaev et al., 2013), and computers and gaming are seen as typical boys' interests (Terlecki et al., 2011). This indicates that stereotypical masculinity is defined not only in terms of agentic traits but also in terms of specific interests and behaviours. This finding is in line with Priess et al. (2009), who called into question what exactly is being measured by sex role inventories and suggested considering whether agency remains synonymous with masculinity. It further demonstrates the potential of using spontaneous self-descriptions to gain new insights into gender stereotypes in adolescents. This approach can reveal the most relevant aspects of one's self-concept, unfiltered by researchers' pre-selection. Especially in adolescent samples, this bottom-up approach to assessing self-stereotyping might be useful to ensure that the attributes examined are salient to adolescents in terms of language and significance.

Limitations and future directions

The first limitation of the present study concerns the cross-sectional nature of the reported data, which limits our ability to draw developmental conclusions. In order to detect changes in gender role identity at both the group and individual level, the spontaneous self-description method should be employed in a longitudinal design. The second limitation relates to the self-description instructions participants received. In light of their age and lack of experience with psychological testing, the participants were provided with a concrete example of a personal trait ('honest') in the pre-assessment instructions. Although this example was not the most frequently named attribute, it was named in the self-

descriptions. However, while this instruction indisputably could have led participants to use the attribute 'honest' more often, it is not probable that this example led them to name more communal than agentic words in general. The attribute 'honest' falls within the morality facet of communion, whereas other frequently named communal words in our study were related to warmth, e.g., 'nice', 'helpful', 'friendly', 'polite' and 'animal-loving' (Abele & Hauke, 2019; Abele et al., 2016). Third, the students were asked to describe themselves using a maximum of three attributes, which might restrict the scope of our data. However, this approach forced the students to name the attributes that were most salient for their self-concepts, leading to more relevant results. Future research should combine both quantitative and qualitative measures to examine the effect of the method used on gender intensification. Fourth, data analysed in this study was already collected in 2011. However, our results are in line with results of recent studies on gender intensification (e.g., Block et al., 2018) and gender stereotypes in men's and women's self-descriptions (Donnelly & Twenge, 2017). Finally, this study focuses only on self-descriptions in terms of agency and communion, not taking into account other facets of gender identity. Future studies might investigate gender intensification by assessing gender identity using other measures, such as overall felt gender typicality (see Egan & Perry, 2001).

Conclusion

The results of the present study contribute to the body of research on gender role identity and gender intensification in adolescents using cross-sectional data collected with the spontaneous self-description method. The results provide evidence for small gender differences in self-attributed agency and communion, but not for gender intensification in early and middle adolescence. Although it may be premature to conclude that recent adolescent cohorts represent a new generation moving towards a post-gender culture, the lack of support for gender intensification across adolescence, the small percentage of attributes for which gender differences were found, and the large number of neutral attributes used by both boys and girls to describe themselves indicate that some changes may be afoot.

Disclosure statement

No potential conflict of interest was reported by the authors.

Funding

This research was partially supported by the following Austrian federal ministries: Education, the Arts and Culture; Women and Public Service; Transport, Innovation and Technology; Labor, Social Affairs and Consumer Protection; Family and Youth.

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References

- Abele, A. E. (2014). Pursuit of communal values in an agentic manner: A way to happiness? *Frontiers in Psychology*, 5: 1320, 1–9. <https://doi.org/10.3389/fpsyg.2014.01320>
- Abele, A. E., & Hauke, N. (2019). Comparing the facets of the Big Two in global evaluation of self versus other people. *European Journal of Social Psychology*, 50, 969–982. <https://doi.org/10.1002/ejsp.2639>
- Abele, A. E., Hauke, N., Peters, K., Louvet, E., Szymkow, A., & Duan, Y. P. (2016). Facets of the fundamental content dimensions: Agency with competence and assertiveness – Communion with warmth and morality. *Frontiers in Psychology*, 7: 1810, 1–17. <https://doi.org/10.3389/fpsyg.2016.01810>
- Abele, A. E., Rupperecht, T., & Wojciszke, B. (2008a). The influence of success and failure experiences on agency. *European Journal of Social Psychology*, 38(3), 436–448. <https://doi.org/10.1002/ejsp.454>
- Abele, A. E., & Wojciszke, B. (2007). Agency and communion from the perspective of self versus others. *Journal of Personality and Social Psychology*, 93(5), 751–763. <https://doi.org/10.1037/0022-3514.93.5.751>
- Athenstaedt, U. (2003). On the content and structure of the gender role self-concept: Including gender-stereotypical behaviors in addition to traits. *Psychology of Women Quarterly*, 27(4), 309–318. <https://doi.org/10.1111/1471-6402.00111>
- Bakan, D. (1966). *The duality of human existence: An essay on psychology and religion*. Rand McNally.

- Blanchard-Fields, F., Suhrer-Roussel, L., & Hertzog, C. (1994). A confirmatory factor analysis of the bem sex role inventory: Old questions, new answers. *Sex Roles*, 30, 423–457. <https://doi-org.uaccess.univie.ac.at/10.1007/BF01420602>
- Bartz, J. A., & Lydon, J. E. (2004). Close relationships and the working self-concept: Implicit and explicit effects of priming attachment on agency and communion. *Personality & Social Psychology Bulletin*, 30(11), 1389–1401. <https://doi.org/10.1177/0146167204264245>
- Bem, S. L. (1974). The measurement of psychological androgyny. *Journal of Consulting and Clinical Psychology*, 42(2), 155–162. <https://doi.org/10.1037/h0036215>
- Blakemore, J. E. O. (2003). Children's beliefs about violating gender norms: Boys shouldn't look like girls, and girls shouldn't act like boys. *Sex Roles*, 48(9–10), 411–419. <https://doi.org/10.1023/A:1023574427720>
- Blakemore, J. E. O., & Centers, R. E. (2005). Characteristics of boys' and girls' toys. *Sex Roles*, 53(9–10), 619–633. <https://doi.org/10.1007/s11199-005-7729-0>
- Block, K., Gonzalez, A. M., Schmader, T., & Baron, A. S. (2018). Early gender differences in core values predict anticipated family versus career orientation. *Psychological Science*, 29(9), 1540–1547. <https://doi.org/10.1177/0956797618776942>
- Boldizar, J. P. (1991). Assessing sex typing and androgyny in children: The children's sex role inventory. *Developmental Psychology*, 27(3), 505–515. <https://doi.org/10.1037/0012-1649.27.3.505>
- Brinthaup, T. M., & Erwin, L. J. (1992). Reporting about the self: Issues and implications. In T. M. Brinthaup & R. P. Lipka (Eds.), *SUNY series, studying the self. The self: Definitional and methodological issues* (pp. 137–171). State University of New York Press.
- Brown, B. B., & Larson, J. (2009). Peer relationships in adolescence. In R. M. Lerner & L. Steinberg (Eds.), *Handbook of adolescent psychology* (pp. adlpsy002004). John Wiley & Sons, Inc. <https://doi.org/10.1002/9780470479193.adlpsy002004>
- Bussey, K., & Bandura, A. (1999). Social cognitive theory of gender development and differentiation. *Psychological Review*, 106(4), 676–713. <https://doi.org/10.1037/0033-295X.106.4.676>
- Chalabaev, A., Sarrazin, P., Fontayne, P., Boiché, J., & Clément-Guillotin, C. (2013). The influence of sex stereotypes and gender roles on participation and performance in sport and exercise: Review and future directions. *Psychology of Sport and Exercise*, 14(2), 136–144. <https://doi.org/10.1016/j.psychsport.2012.10.005>
- Chen, F., Zhu, S., & Bi, C. (2018). The development of self-esteem and the role of agency and communion: A longitudinal study among Chinese. *Journal of Child and Family Studies*, 27(3), 816–824. <https://doi.org/10.1007/s10826-017-0942-y>
- Cowan, M. L., & Stewart, B. J. (1977). A methodological study of sex stereotypes. *Sex Roles*, 3(3), 205–216. <https://doi.org/10.1007/BF00287610>
- Deaux, K., & LaFrance, M. (1998). Gender. In *The handbook of social psychology*, (Vols. 1–2, 4th ed., pp. 788–827). McGraw-Hill.
- Diehl, M., Owen, S. K., & Youngblade, L. M. (2004). Agency and communion attributes in adults' spontaneous self-representations. *International Journal of Behavioral Development*, 28(1), 1–15. <https://doi.org/10.1080/01650250344000226>

- Donnelly, K., & Twenge, J. M. (2017). Masculine and feminine traits on the Bem Sex-Role Inventory, 1993–2012: A cross-temporal meta-analysis. *Sex Roles*, 76(9–10), 556–565. <https://doi.org/10.1007/s11199-016-0625-y>
- Eagly, A. H. (1987). *John M. MacEachran memorial lecture series; 1985. Sex differences in social behavior: A social-role interpretation*. Lawrence Erlbaum Associates, Inc.
- Eagly, A. H., Wood, W., & Diekmann, A. B. (2000). Social role theory of sex differences and similarities: A current appraisal. In T. Eckes & H. M. Trautner (Eds.), *The developmental social psychology of gender* (pp. 123–174). Lawrence Erlbaum Associates Publishers.
- Ebert, I. D., Steffens, M. C., & Kroth, A. (2014). Warm, but maybe not so competent? – Contemporary implicit stereotypes of women and men in Germany. *Sex Roles*, 70(9), 359–375. <https://doi.org/10.1007/s11199-014-0369-5>
- Eccles, J. S., & Roeser, R. W. (2011). Schools as developmental contexts during adolescence. *Journal of Research on Adolescence*, 21(1), 225–241. <https://doi.org/10.1111/j.1532-7795.2010.00725.x>
- Egan, S. K., & Perry, D. G. (2001). Gender identity: A multidimensional analysis with implications for psychosocial adjustment. *Developmental Psychology*, 37(4), 451–463. <https://doi.org/10.1037/0012-1649.37.4.451>
- Endendijk, J. J., Groeneveld, M. G., van Berckel, S. R., Hallers-Haalboom, E. T., Mesman, J., & Bakermans-Kranenburg, M. J. (2013). Gender stereotypes in the family context: Mothers, fathers, and siblings. *Sex Roles*, 68(9), 577–590. <https://doi.org/10.1007/s11199-013-0265-4>
- Fivush, R., Brotman, M. A., Buckner, J. P., & Goodman, S. H. (2000). Gender differences in parent–child emotion narratives. *Sex Roles*, 42(3/4), 233–253. <https://doi.org/10.1023/A:1007091207068>
- Fournier, M. A., & Moskowitz, D. S. (2000). The mitigation of interpersonal behavior. *Journal of Personality and Social Psychology*, 79(5), 827–836. <https://doi.org/10.1037/0022-3514.79.5.827>
- Galambos, N. L., Almeida, D. M., & Petersen, A. C. (1990). Masculinity, femininity, and sex role attitudes in early adolescence: Exploring gender intensification. *Child Development*, 61(6), 1905–1914. <https://doi.org/10.2307/1130846>
- Gebauer, J. E., Wagner, J., Sedikides, C., & Neberich, W. (2013). Agency-communion and self-esteem relations are moderated by culture, religiosity, age, and sex: Evidence for the “self-centrality breeds self-enhancement” principle. *Journal of Personality*, 81(3), 261–275. <https://doi.org/10.1111/j.1467-6494.2012.00807.x>
- Gerson, K. (2010). *The unfinished revolution: How a new generation is reshaping family, work, and gender in America*. Oxford University Press.
- Gottfredson, L. S. (2002). Gottfredson’s theory of circumscription, compromise, and self-creation. In Brown D. (Ed.), *Career choice and development* (4th ed., pp. 85–148). Jossey-Bass
- Halim, M. L., & Ruble, D. N. (2010). Gender identity and stereotyping in early and middle childhood. In J. Chrisler & D. McCreary (Eds.), *Handbook of gender research in psychology* (pp. 495–525). Springer.
- Helgeson, V. S. (1994). Relation of agency and communion to well-being: Evidence and potential explanations. *Psychological Bulletin*, 116(3), 412–428. <https://doi.org/10.1037/0033-2909.116.3.412>

- Helgeson, V. S. (2015). Gender and personality. In M. Mikulincer, P. R. Shaver, L. M. Cooper, & R. J. Larsen (Eds.), *APA handbook of personality and social psychology* (Personality processes and individual differences) (Vol. 4, pp. 515–534). American Psychological Association. <https://doi.org/10.1037/14343-000>
- Helgeson, V. S., & Fritz, H. L. (1999). Unmitigated agency and unmitigated communion: Distinctions from agency and communion. *Journal of Research in Personality*, 33(2), 131–158. <https://doi.org/10.1006/jrpe.1999.2241>
- Helgeson, V. S., & Palladino, D. K. (2012). Agentic and communal traits and health: Adolescents with and without diabetes. *Personality & Social Psychology Bulletin*, 38(4), 415–428. <https://doi.org/10.1177/0146167211427149>
- Heyder, A., & Kessels, U. (2013). Is school feminine? Implicit gender stereotyping of school as a predictor of academic achievement. *Sex Roles*, 69(11–12), 605–617. <https://doi.org/10.1007/s11199-013-0309-9>
- Hill, J. P., & Lynch, M. E. (1983). The intensification of gender-related role expectations during early adolescence. In J. Brooks-Gunn & A. C. Petersen (Eds.), *Girls at puberty: Biological and psychosocial perspectives* (pp. 201–228). Springer. https://doi.org/10.1007/978-1-4899-0354-9_10
- Hoffman, M. L., Powlishta, K. K., & White, K. J. (2004). An examination of gender differences in adolescent adjustment: The effect of competence on gender role differences in symptoms of psychopathology. *Sex Roles*, 50(11/12), 795–810. <https://doi.org/10.1023/B:SERS.0000029098.38706.b1>
- Hyde, J. S. (2005). The gender similarities hypothesis. *American Psychologist*, 60(6), 581–592. <https://doi.org/10.1037/0003-066X.60.6.581>
- Jackson, L. A. (1985). Self-conceptions and gender role: The correspondence between gender-role categorization and open-ended self-descriptions. *Sex Roles*, 13(9), 549–566. <https://doi.org/10.1007/BF00287761>
- Kane, E. W. (2006). “No way my boys are going to be like that!”: Parents’ responses to children’s gender nonconformity. *Gender & Society*, 20(2), 149–176. <https://doi.org/10.1177/0891243205284276>
- Kite, M. E., Deaux, K., & Haines, E. L. (2008). Gender stereotypes. In *Women’s psychology. Psychology of women: A handbook of issues and theories* (2nd ed., pp. 205–236). Praeger Publishers/Greenwood Publishing Group.
- Klaczynski, P. A., Felmban, W. S., & Kole, J. (2020). Gender intensification and gender generalization biases in pre-adolescents, adolescents, and emerging adults. *British Journal of Developmental Psychology*, 38(3), 415–433. <https://doi.org/10.1111/bjdp.12326>
- Kollmayer, M., Pfaffel, A., Schultes, M.-T., Lüftenegger, M., Finsterwald, M., Popper, V., Jöstl, G., Spiel, C., & Schober, B. (2019). REFLECT – Ein Interventionsprogramm zum Aufbau von Lehrkräftekompetenzen für Reflexive Koedukation. *Zeitschrift für Entwicklungspsychologie und Pädagogische Psychologie*, 51(2), 110–122. <https://doi.org/10.1026/0049-8637/a000210>
- Kollmayer, M., Schultes, M.-T., Lüftenegger, M., Finsterwald, M., Spiel, C., & Schober, B. (2020). REFLECT – A teacher training program to promote gender equality in schools. *Frontiers in Education*, 5: 136, 1–8. <https://doi.org/10.3389/feduc.2020.00136>

- Kollmayer, M., Schultes, M.-T., Schober, B., Hodosi, T., & Spiel, C. (2018a). Parents' judgments about the desirability of toys for their children: Associations with gender role attitudes, gender-typing of toys, and demographics. *Sex Roles*, 79(5), 329–341. <https://doi.org/10.1007/s11199-017-0882-4>
- Landis, J. R., & Koch, G. G. (1977). The measurement of observer agreement for categorical data. *Biometrics*, 33(1), 159–174. <https://doi.org/10.2307/2529310>
- Le, B. M., Impett, E. A., Lemay, E. P., Jr., Muise, A., & Tskhay, K. O. (2018). Communal motivation and well-being in interpersonal relationships: An integrative review and meta-analysis. *Psychological Bulletin*, 144(1), 1–25. <https://doi.org/10.1037/bul0000133>
- Lienert, G. A. (1969). Configural frequency analysis as a classification method in clinical psychology. In M. Irle (Ed.), *Bericht über den 26. Kongress der Deutschen Gesellschaft für Psychologie in Tübingen 1968* (pp. 244–253). Hogrefe.
- Martinez, M. A., Osornio, A., Halim, M. L. D., & Zosuls, K. M. (2019). Gender: Awareness, identity, and stereotyping. In Brownell, J. (Ed.), *Encyclopedia of Infant and Early Child Development* (2nd ed.) (pp. 1–12). Elsevier. <https://dx.doi.org/10.1016/B978-0-12-809324-5.21818-X>
- McCabe, A., & Dinh, K. T. (2016). Agency and communion, ineffectiveness and alienation: Themes in the life stories of latino and southeast asian adolescents. *Imagination, Cognition and Personality*, 36(2), 150–171. <https://doi.org/10.1177/0276236616648648>
- McDowell, L. (2012). Post-crisis, post-Ford and post-gender? Youth identities in an era of austerity. *Journal of Youth Studies*, 15(5), 573–590. <https://doi.org/10.1080/13676261.2012.671933>
- McGuire, W. J., & McGuire, C. V. (1982). Significant others in self-space: Sex differences and developmental trends in social self. In J. Suls (Ed.), *Psychological perspectives on the self* (Vol. 1, pp. 71–96). Erlbaum.
- McGuire, W. J., & McGuire, C. V. (1988). Content and process in the experience of self. In McGuire, L. (Ed.), *Advances in experimental social psychology, Social psychological studies of the self: Perspectives and programs* (Vol. 21, pp. 97–144). Academic Press.
- McGuire, W. J., & Padawer-Singer, A. (1976). Trait salience in the spontaneous self-concept. *Journal of Personality and Social Psychology*, 33(6), 743–754. <https://doi.org/10.1037/0022-3514.33.6.743>
- Morawska, A. (2020). The effects of gendered parenting on child development outcomes: A systematic review. *Clinical Child and Family Psychology Review*, 23(4), 553–576. <https://doi.org/10.1007/s10567-020-00321-5>
- Moss-Racusin, C. A., Phelan, J. E., & Rudman, L. A. (2010). When men break the gender rules: Status incongruity and backlash against modest men. *Psychology of Men & Masculinity*, 11(2), 140–151. <https://doi.org/10.1037/a0018093>
- Myers, A. M., & Gonda, G. (1982). Empirical validation of the Bem Sex-Role Inventory. *Journal of Personality and Social Psychology*, 43(2), 304–318. <https://doi.org/10.1037/0022-3514.43.2.304>
- Nielson, M. G., Schroeder, K. M., Martin, C. L., & Cook, R. E. (2020). Investigating the relation between gender typicality and pressure to conform to gender norms. *Sex Roles*, 83(9–10), 523–535. <https://doi.org/10.1007/s11199-020-01136-y>

- Ojanen, T., Grönroos, M., & Salmivalli, C. (2005). An interpersonal circumplex model of children's social goals: Links with peer-reported behavior and sociometric status. *Developmental Psychology*, 41(5), 699–710. <https://doi.org/10.1037/0012-1649.41.5.699>
- Pedhazur, E. J., & Totenbaum, T. J. (1979). Bem Sex-Role Inventory: A theoretical and methodological critique. *Journal of Personality and Social Psychology*, 37(6), 996–1016. <https://doi.org/10.1037/0022-3514.37.6.996>
- Pöhlmann, K. (2001). Agency- and communion-orientation in life goals: Impacts on goal pursuit strategies and psychological well-being. In P. Schmuck & K. M. Sheldon (Eds.), *Life goals and well-being: Towards a positive psychology of human striving* (pp. 68–84). Hogrefe & Huber Publishers.
- Priess, H. A., Lindberg, S. M., & Hyde, J. S. (2009). Adolescent gender-role identity and mental health: Gender intensification revisited. *Child Development*, 80(5), 1531–1544. <https://doi.org/10.1111/j.1467-8624.2009.01349.x>
- Questback GmbH. (2016). *Unipark (EFS Fall 2016)*.
- Retelsdorf, J., Schwartz, K., & Asbrock, F. (2015). "Michael can't read!" Teachers' gender stereotypes and boys' reading self-concept. *Journal of Educational Psychology*, 107(1), 186–194. <https://doi.org/10.1037/a0037107>
- Ruble, D. N., Martin, C. L., & Berenbaum, S. A. (2006). Gender development. In N. Eisenberg (Ed.), *Handbook of child psychology: Vol. 3, Personality and social development* (6th ed., pp. 858–932). Wiley.
- Ryan, A. M. (2001). The peer group as a context for the development of young adolescent motivation and achievement. *Child Development*, 72(4), 1135–1150. <https://doi.org/10.1111/1467-8624.00338>
- Saragovi, C., Aubé, J., Koestner, R., & Zuroff, D. (2002). Traits, motives, and depressive styles as reflections of agency and communion. *Personality & Social Psychology Bulletin*, 28(5), 563–577. <https://doi.org/10.1177/0146167202288001>
- Schultes, M.-T., Jöstl, G., Finsterwald, M., Schober, B., & Spiel, C. (2015). Measuring intervention fidelity from different perspectives with multiple methods: The "Reflect" program as an example. *Studies in Educational Evaluation*, 47, 102–112. <https://doi.org/10.1016/j.stueduc.2015.10.001>
- Sheldon, K. M., & Cooper, M. L. (2008). Goal striving within agentic and communal roles: Separate but functionally similar pathways to enhanced well-being. *Journal of Personality*, 76(3), 415–448. <https://doi.org/10.1111/j.1467-6494.2008.00491.x>
- Siegler, I. C., George, L. K., & Okun, M. A. (1979). Cross-sequential analysis of adult personality. *Developmental Psychology*, 15(3), 350–351. <https://doi.org/10.1037/0012-1649.15.3.350>
- Sirin, S. R., McCreary, D. R., & Mahalik, J. R. (2004). Differential reactions to men and women's gender role transgressions: Perceptions of social status, sexual orientation, and value dissimilarity. *The Journal of Men's Studies*, 12(2), 119–132. <https://doi.org/10.3149/jms.1202.119>
- Skinner, O. D., McHale, S. M., Wood, D., & Telfer, N. A. (2019). Gender-typed personality qualities and African American youth's school functioning. *Journal of Youth and Adolescence*, 48(4), 680–691. <https://doi.org/10.1007/s10964-018-0919-1>
- Spence, J. T., Helmreich, R., & Stapp, J. (1975). Ratings of self and peers on sex role attributes and their relation to self-esteem and conceptions of masculinity and

- femininity. *Journal of Personality and Social Psychology*, 32(1), 29–39. <https://doi.org/10.1037/h0076857>
- Statistics Austria. (2015). *Migration and integration*. Retrieved December, 9, 2019 from https://www.integrationsfonds.at/fileadmin/content/Statistisches_Jahrbuch_migration_integration_2015_.pdf
- Terlecki, M., Brown, J., Harner-Steciw, L., Irvin-Hannum, J., Marchetto-Ryan, N., Ruhl, L., & Wiggins, J. (2011). Sex differences and similarities in video game experience, preferences, and self-efficacy: Implications for the gaming industry. *Current Psychology*, 30(1), 22–33. <https://doi.org/10.1007/s12144-010-9095-5>
- Tian, L., Chen, H., & Huebner, E. S. (2014). The longitudinal relationships between basic psychological needs satisfaction at school and school-related subjective well-being in adolescents. *Social Indicators Research*, 119(1), 353–372. <https://doi.org/10.1007/s11205-013-0495-4>
- Twenge, J. M. (1997). Changes in masculine and feminine traits over time: A meta-analysis. *Sex Roles*, 36(5–6), 305–325. <https://doi.org/10.1007/BF02766650>
- Uchrowski, M. (2008). Agency and communion in spontaneous self-descriptions: Occurrence and situational malleability. *European Journal of Social Psychology*, 38(7), 1093–1102. <https://doi.org/10.1002/ejsp.563>
- Van Grootel, S., Van Laar, C., Meeussen, L., Schmader, T., & Szesny, S. (2018). Uncovering pluralistic ignorance to change men's communal self-descriptions, attitudes, and behavioral intentions. *Frontiers in Psychology*, 9: 1344, 1–12. <https://doi.org/10.3389/fpsyg.2018.01344>
- Von Eye, A. (1990). *Introduction to configural frequency analysis: The search for types and antitypes in cross-classification*. Cambridge University Press.
- Von Eye, A. (2000). Configural frequency analysis - A program for 32 bit windows operating systems: Manual for program version 2000. *MPR-online*, 6(1), 2–21. <https://www.dgps.de/fachgruppen/methoden/mpr-online/issue14/art1/cfa.pdf>
- Von Eye, A., Mun, E. Y., & Bogat, G. A. (2008). Temporal patterns of variable relationships in person-oriented research: Longitudinal models of configural frequency analysis. *Developmental Psychology*, 44(2), 437–445. <https://doi.org/10.1037/0012-1649.44.2.437>
- Wichstrøm, L. (1999). The emergence of gender difference in depressed mood during adolescence: The role of intensified gender socialization. *Developmental Psychology*, 35(1), 232–245. <https://doi.org/10.1037/0012-1649.35.1.232>
- Wilde, A., & Diekmann, A. B. (2005). Cross-cultural similarities and differences in dynamic stereotypes: A comparison between Germany and the United States. *Psychology of Women Quarterly*, 29(2), 188–196. <https://doi.org/10.1111/j.1471-6402.2005.00181.x>
- Wise, P. S., & Joy, S. S. (1982). Working mothers, sex differences, and self-esteem in college students' self-descriptions. *Sex Roles*, 8(7), 785–790. <https://doi.org/10.1007/BF00287573>
- Wojciszke, B., Baryla, W., Parzuchowski, M., Szymkow, A., & Abele, A. E. (2011). Self-esteem is dominated by agentic over communal information. *European Journal of Social Psychology*, 41(5), 617–627. <https://doi.org/10.1002/ejsp.791>

2nd Publication: Korlat, S., Schultes, M.-T., Schober, B., Spiel, C., & Kollmayer, M. (submitted). Adolescents' Gender Role Identity and Occupational Aspirations: Gender Typicality, Prestige and Leadership Desire. *Psychology of Women Quarterly*.

Contributions by the individual authors

Selma Korlat participated in the data preparation and categorization, conducted and interpreted data analyses and drafted the manuscript.

Marie-Therese Schultes participated in the design and coordination of the study, data categorization and contributed to the final version of the manuscript.

Barbara Schober and **Christiane Spiel** conceived the study design and contributed to the final version of the manuscript.

Marlene Kollmayer participated in the data categorization and coding process, supervised the manuscript preparation and contributed to the final version of the manuscript.

All authors read and approved the final manuscript.

**Adolescents' Gender Role Identity and Occupational Aspirations:
Gender Typicality, Prestige and Leadership Desire**

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We have no known conflict of interest to disclose.

Acknowledgements: Special thanks go to Julia Lester, Melanie Schaefer and Nora Foerst for their collaboration and support in data coding.

Abstract

Previous studies have identified gender as an important factor for career-related aspirations. This study aims to investigate gender differences in three gendered aspects of occupational aspirations – gender typicality, prestige and leadership desire – as well as the role of gender-typed personality traits as a possible mechanism underlying these gender differences in early adolescence. Both agency and communion as well as occupational aspirations are measured using the spontaneous self-description method. In total, 2779 adolescents between 11 and 15 years of age reported their occupational aspirations, later coded for gender typicality, prestige and spontaneous expressions of leadership desire. Participants also described themselves with three attributes, later coded in terms of agency and communion. The results showed significant gender differences in a stereotypical direction for 40% of the occupations named, with boys expressing a clear preference for typically masculine occupations and girls for typically feminine occupations. Conversely, the results revealed higher aspirations among girls regarding occupational prestige and insignificant differences in leadership desire. Communion was found to be a significant moderator between gender and aspiration to typically feminine occupations, while agency mediated the relationship between gender and the prestige of occupational aspirations. The findings' implications for theory and practice are discussed.

Keywords: occupational aspirations, gender typicality, prestige, leadership, agency, communion

Introduction

Adolescence is a major transitional period within the life course, characterized by numerous developmental milestones (Choudhury et al., 2006). Already by early adolescence, as young people become more goal-oriented and focused on their future, they reach the milestone of forming occupational aspirations (Gottfredson, 1981; Nurmi, 2004). Studies have shown occupational aspirations to be one of the most important factors affecting occupational choices (Mau & Bikos, 2000). Adolescents with high occupational aspirations experience greater career success, are more likely to enter professional or managerial careers and have higher occupational prestige and wage attainment than those with lower aspirations (Mello, 2008; Schoon et al., 2007; Schoon & Polek, 2011). Gender has been found to be essential for the formation of occupational aspirations (Hajdar et al, 2015), with gender stereotypes identified as a driving force behind boys' and girls' career choices (Van Grootel et al., 2018). Girls are likely to aspire to “feminine” professions in health, elementary education and domestic fields (HEED), such as being a nurse, teacher or hairdresser, while boys are more likely to aspire to “masculine” careers in science, technology, engineering and mathematics (STEM), such as being a mechanic, engineer or IT specialist (OECD, 2012, 2017). Consequently, there is compelling evidence for a consistent underrepresentation of women in STEM fields, as well as in high-status and high-pay occupations (Croft et al., 2015, European Commission, 2017; WEF, 2017). Nevertheless, recent studies suggest that adolescent girls are at least as likely, if not more so, than adolescent boys to aspire to managerial positions (Mello, 2008; Schoon, 2006; Schoon et al., 2007) and prestigious jobs (Ashby & Schoon, 2010; Perry & Vance, 2010; Rani, 2018; Watts et al., 2015; Wicht, 2016), signaling a discrepancy between girls' occupational aspirations regarding leadership and prestige and the realization of those aspirations (Wicht et al., 2021). As STEM professions,

managerial positions and prestigious occupations are typically associated with stereotypically masculine traits (Schein, 2001; Sczesny, 2003), scholars have highlighted the importance of gender-typed personality traits – agency and communion – in understanding gender differences in occupational aspirations and choices (e.g., Bandura et al., 2001; Correl, 2004; Eagly & Wood, 2012; Eccless, 2009; Gottfredson, 2005). Previous studies investigating the role of agency and communion in the gender typicality of occupational aspirations and choices used predetermined item lists such as the Bem Sex Role Inventory (BSRI; Bem, 1974) – an approach that can negatively affect the self-report process (Brinthaup & Erwin, 1992; Cowan & Stewart, 1977). Moreover, the role of agency and communion in other stereotyped aspects of occupational aspirations – namely prestige and leadership aspirations - has been less frequently investigated. Consequently, this study aims to investigate gender differences in these three gendered aspects of occupational aspirations – gender typicality, prestige and leadership desire – as well as the role of agency and communion as a possible mechanism behind these gender differences in early adolescence, applying the spontaneous self-description method to measure both gender-typed personality traits (gender role self-concept) as well as occupational aspirations.

Gender Typicality in Occupational Aspirations and Choices

An individual's occupation encompasses a large portion of their life and plays a critical role in their perceived success and social position (Weisgram et al., 2010). A successful career has also been found to predict life quality, mental health and social relationships (Cochran et al., 2010; Thomas et al., 2007) and to provide a central source of meaning and identity for most adults (Deaux, 2001; Hulin, 2002). Therefore, great attention has been paid to inequalities and potential disadvantages of certain groups in the world of work. One of the most characteristic and enduring aspects of the labor market is its gender segregation (European Commission, 2009,

2017), which is patterned both vertically and horizontally (e.g., Lippa et al., 2014). Vertical segregation refers to men's domination of high-status jobs and managerial positions, whereas horizontal segregation refers to the concentration of men and women in different kinds of jobs based on women's perceived fit in human-centered fields and men's perceived fit in impersonal and tech-intensive fields (Charles & Bradley, 2009; Eagly et al., 2020). Even adolescents' occupational aspirations reflect this pattern of horizontal gender segregation (Makarova et al., 2019; OECD, 2017). Compelling evidence shows that, on average, girls aspire to and expect to pursue female-dominated occupations, while boys aspire to and expect to pursue male-dominated occupations (e.g., Su et al., 2009; Ramazi et al., 2017; Wegemer & Eccles, 2019; Wicht et al., 2021). Although some studies have uncovered higher flexibility in girls' occupational aspirations, with a greater tendency to include all types of occupations – masculine, feminine and balanced – within their set of possible options (for a review see Hartung et al., 2005), newer studies indicate that the stereotypical pattern seems to be relatively stable during adolescence and young adulthood (Bubany & Hansen, 2011).

Social role theory (Eagly and Wood, 2012) posits that sex differences in activities related to occupational choices reflect gender role beliefs, which in turn reflect men's and women's social roles in the society in which they live. In Western cultures, from an early age, children see men in positions of power and women in supportive roles in media as well as their personal surroundings (Raffaele Mendez & Crawford, 2002). While the masculine gender role involves having a successful career and providing for a family, the feminine gender role involves caring for others, nurturing and being social and service-oriented (Wisgram et al., 2011). Thus, children learn that masculine or agentic qualities (such as being achievement-oriented, competent, decisive and competitive) are required for leadership positions as well as prestigious careers such

as those in STEM fields, whereas in HEED fields, communal qualities are required (such as being tender-minded, sociable, kind and oriented toward others) (Heilman, 2012). In line with gender stereotypes, socialization agents (e.g., parents and teachers) provide boys with learning opportunities in computing and science, attribute them roles of leadership, initiative, and independence. In contrast, girls are more encouraged to read and to build social relationships, thus shaping their self-image and subsequent career choices (Ramazi et al., 2017; Eccles et al., 2009). During early adolescence, boys and girls form gender-differentiated identities based on the perceived need to adhere to future social roles (Hill & Lynch, 1983), which translates into gender-differentiated educational pathways and gender-typical occupational aspirations (Eccles, 2009). A meta-analytic review found that girls tend to prefer people-oriented jobs involving interpersonal tasks (e.g., teaching and helping people), while boys tend to prefer things-oriented occupations involving impersonal tasks such as working with tools and machines (Su et al., 2009). Hence, occupations are evaluated as to whether they match one's gender role, with gender stereotypes driving a vicious cycle maintaining the stereotypical division of labor (Croft et al., 2015).

Agency and Communion in Occupational Aspirations and Choices

Several theories describe the relevance of gender-related constructs for adolescents' occupational aspirations (Dinella et al., 2014). The theory of circumscription and compromise (Gottfredson, 1981) postulates that adolescents rule out careers that are incompatible with their emerging gender identity because their gender self-concept is the most strongly protected aspect of self. When developing occupational aspirations, a job with the "wrong" gender typicality will not be considered since it is perceived as threatening to the adolescent's gender self-concept (Gottfredson, 2005). Similarly, goal congruity theory posits that the congruence between one's

communal and agentic goals and the perception that an occupation affords those goals is a key factor in occupational interests (Diekmann et al., 2010). Diekmann and colleagues (2010) showed that women have higher communal career goals (e.g., wanting to help) than men, and that this partially explains women's lower interest in STEM careers, which are generally perceived as low in communal goal fulfillment (Diekmann et al., 2011). A meta-analysis supported this notion, showing that women, more than men, tend to prefer jobs that allow them to help others, make friends and work with people, whereas men, more than women, prefer jobs that can be conducted in solitude (Konrad et al., 2000). Studies with adolescent samples are in line with this, showing that adolescent girls place a greater value on jobs that allow them to work with or help others (Cinamon & Rich, 2002; Eccles, 1994; Konrad et al., 2000) and to spend time with family (Eccles, 2007; Freund et al 2013). Adolescent boys place more emphasis on making money, being challenged, and working with mathematics and computers (Ashby & Schoon, 2010; Eccles, 2007). The Eccles et al. (1983) model also predicts that self-perceived agency and communion resulting from the socialization process lead boys and girls to have different hierarchies of core personal values, which consequently serve as significant predictors of occupational interests and choices.

Scholars have thus focused on gender-typed personality traits – agency and communion – to understand gender differences in career-related aspirations and behavior. However, empirical studies investigating the role of these traits have yielded mixed results. Some studies found agency to predict masculine occupational choices (Leaper & Van, 2008) and communion to predict interest in occupations with feminine descriptions (Forsman & Barth, 2017) in men. In contrast, another study showed agency to be a negative and communion to be a positive predictor of gender-typed vocational aspirations in young women, but not in young men (Weisgram et al.,

2011). Dinella et al. (2014) found that young adults' agency and communion were predictive of career interests in a stereotyped direction, but more consistently for young women than young men. A study investigating the role of agency and communion in the gender typicality of occupational aspirations among gifted adolescents (11-14 years of age) showed that the self-perceived level of opposite-gender-typed characteristics predicted the gender typicality of career aspirations for both boys and girls: Girls who perceived themselves as possessing higher levels of agentic traits were more likely to aspire to male-dominated careers, whereas boys who perceived themselves as possessing higher levels of communal traits were more attracted to female-dominated careers (Raffaele Mendez & Crawford, 2002). A recent study with adolescents aged 13 to 16 revealed a similar pattern: Girls who described themselves as low in agency and boys who described themselves as low in communion were somewhat more likely to select gender-typical internships after graduation (Sinclair et al., 2019).

Prestige and Leadership Desire in Occupational Aspirations

Agentic qualities are seen as required not only for STEM and typically masculine jobs, but also for leadership positions (Carli & Eagly, 2016; Eagly & Karau, 2002; Lyness & Heilman, 2006) and success in business in general (Rosette & Tost, 2010). As a result of societal gender roles, high agency may relate to vocational aspirations involving influence over others, whereas high communion may relate to vocational aspirations that do not involve leadership roles and authority over others (Weisgram et al., 2011). Thus, girls might avoid aspiring to leadership roles, as leadership is traditionally associated with agentic attributes (Carli & Eagly, 2016; Eagly & Karau, 2002). A meta-analysis investigating the extent to which stereotypes of leaders are culturally masculine confirmed that leaders are perceived as similar to men but not women (also known as the “think manager, think male” concept; Schein et al. 1996), and as more agentic than

communal (Koenig et al., 2011). New findings on perceived agency and communion in leadership emergence indicate that the balance between agency and communion was associated with the highest ascriptions of leadership potential in women (Schock et al., 2019). A recent study examining gender differences in constructs associated with leadership aspirations among undergraduate students found that women expressed lower interest in attaining elite leadership positions (e.g., CEO, senator) and placed higher importance on being a good spouse/parent, experiencing love, and good health (Sheppard, 2018). However, evidence from studies with adolescents suggests that even though society often links leadership roles to men and masculinity (Richway & Correll, 2004), adolescent girls are at least as likely, if not more so, than adolescent boys to aspire to managerial jobs (Mello, 2008; Schoon, 2006; Schoon et al., 2007).

Similarly, while older studies showed that girls, compared to boys, often opt for less prestigious and lower-earning jobs in the labor market (Shapka et al., 2006), recent work has found the reverse pattern, with girls aspiring to more prestigious occupations than boys (e.g., Rani, 2018; Watts et al., 2015; Wicht, 2016). This represents a paradox, given that STEM occupations have the highest earning potential and prestige (Diekmann et al., 2017; Raffaele Mendez & Crawford, 2002). Wicht et al. (2021) confirmed that girls tend to aspire to occupations that confer a higher SES than boys. They explained this paradox with respect to segregated vocational interests, as typical boys' interests involve mechanical skills or the ability to work with objects, tools, and machines, which are often located at the lower end of the occupational status hierarchy (such as automobile mechanic, electrician, carpenter, plumber, and truck driver). On the other hand, the occupations typically associated with social interests preferred by girls are often found in the middle to upper-middle range of the occupational status hierarchy (such as teachers, nurses, and doctors). Thus, according to these authors, boys' greater

interest in prestigious STEM professions is not strong enough to position their occupational aspirations high on the occupational status hierarchy. Nevertheless, in the world of work, adult women, on average, have a lower occupational status and work in professions with lower average salaries compared to men (e.g., Gutman & Akerman, 2008). Wicht et al. (2021) argue that this incongruity between occupational aspirations and reality signals that girls, despite having higher aspirations than boys, face occupational barriers that hinder them from realizing these aspirations. The same might be true for leadership aspirations and future leadership positions. Therefore, it is important to investigate factors impeding or fostering vertical gender segregation. Thus, following theories recognizing the importance of gender-typical personality traits for the gender segregation of vocational aspirations, this study investigates the role of agency and communion in prestige and leadership aspirations among adolescent boys and girls.

Measuring Agency and Communion

Previous studies investigating role of agency and communion in occupational aspirations and choices used a quantitative measurement approach, such as the BSRI (Bem, 1974) or similar sex role inventories (e.g., the CSRI; Boldizar, 1991) to assess the extent to which individuals ascribe gender-typed personality traits to themselves. This approach has been criticized (e.g., Moradi & Parent, 2013) for failing to reveal dimensions that are truly relevant for one's self-concept (McGuire and McGuire, 1982, 1988), since predetermined lists of attributes are selected by the researchers rather than by the respondents themselves (Brinthaup & Erwin, 1992). A recent study investigating predictors of STEM career choices longitudinally among adolescents between 1991 and 2014 acknowledged this problem and used questions about participants' gender self-schema (how feminine/masculine they look, how feminine/masculine they feel, how important it is to do things that make them appear feminine/masculine, etc.) instead of the BSRI

(Wegemer & Eccles, 2019). The authors found that communion was associated with choosing the health, biological, and medical sciences within STEM (in which women are well-represented) over mathematics, physical, engineering, and computer sciences (in which women are underrepresented), while agency exhibited the opposite pattern of results. Nevertheless, questions about participants' gender self-schema arguably still do not elicit the most salient aspects of a person's self-concept, as the proposed items are chosen by the researchers and might have cued participants' memory search (Brinthaupt & Erwin, 1992; Cowan & Stewart, 1977; McGuire & McGuire, 1988). McGuire and Padawer-Singer (1976) advocated for the use of spontaneous self-descriptions, a method that allows participants to describe themselves in their own words (see also Uchronski, 2008). This approach provides insights into participants' self-stereotyping unfiltered by researchers' pre-determined selections (for a more detailed discussion, see Korlat et al., 2021).

Present study

The present study focuses on students in early adolescence (11-15 years of age), since this is the period when occupational aspirations are first formed (Nurmi, 2004). According to Gottfredson's (1981) theory of circumscription and compromise, by early adolescence, children have ruled out a number of potential occupations that they believe are inconsistent with their gender role, their social class, or their intellectual potential. Thus, in early adolescence, career options are narrowed, leading to the elimination of certain types of future careers. Moreover, according to the gender intensification hypothesis (Hill & Lynch, 1983), it is during this time that adolescents adopt communal and agentic roles as part of their own gender role identity due to increased pressure to prepare for stereotypical social roles in adulthood. Thus, this developmental period is

pivotal for investigating gender differences and the role of gender role self-concept in occupational aspirations.

The first part of the present study focuses on differences between boys' and girls' occupational aspirations (in terms of gender typicality, prestige level and leadership aspirations). In line with previous studies (Su et al., 2009; Wegemer & Eccles, 2019; Wicht et al., 2021), we expect girls to name more typically feminine and boys to name more typically masculine occupations when asked about their aspirations. As the spontaneous self-description method allows for examining sex differences in the specific occupations that girls and boys spontaneously named when asked about their aspirations, rather than in terms of mean gender typicality scores only, sex differences will be analyzed with respect to the individual occupations named by the adolescents. We expected the specific occupations named more frequently by girls to be typically feminine and the occupations named more frequently by boys to be typically masculine. By contrast, in line with studies revealing the opposite pattern for sex differences in leadership aspirations (Mello, 2008; Schoon, 2006; Schoon et al., 2007) and aspired occupational prestige (Rani, 2018; Watts et al., 2015; Wicht, 2016), we expect girls to express higher leadership desire and aspire to more prestigious occupations compared to boys. In order to investigate potential changes throughout early adolescence, age will be included as a predictor in all analyses.

In the second part of the study, we examine the role of gender-typed personality traits – agency and communion – as a possible mechanism behind gender differences in occupational aspirations. We expect adolescents with agentic gender role self-concepts to aspire to more typically masculine occupations, prestigious jobs and to have a higher leadership desire. In contrast, adolescents with communal gender role self-concepts are expected to aspire to more

typically feminine occupations, less prestigious jobs and to have a lower leadership desire. We also expect agency and communion to partly explain (i.e., mediate) the hypothesized gender gap in occupational aspirations.

Method

Participants and Procedure

The study sample consisted of 2779 Austrian adolescents (1418 girls, $M_{\text{age}} = 12.47$, $SD_{\text{age}} = 1.00$; age-range 11–15) from lower secondary schools predominantly attended by children from middle SES families. The students were 6th ($n = 783$, $M_{\text{age}} = 11.37$, $SD_{\text{age}} = .573$), 7th ($n = 942$, $M_{\text{age}} = 12.35$, $SD_{\text{age}} = .577$) and 8th ($n = 1054$, $M_{\text{age}} = 13.40$, $SD_{\text{age}} = .588$) graders. Thereof, 18.3% of students attended a higher-track (university preparatory) school, whereas 81.7% attended a lower-track school. Students in higher-track schools tend to continue their school-based education until they receive a university entrance qualification around age 18, while students from lower-track schools tend to end their school-based education around age 15 and enter vocational training or the labor force (Austria's Agency for Education and Internationalization, 2021). Among participants, 68% did not come from an immigrant background, while 7% were first-generation immigrants, 15.1% were second-generation immigrants and 9.9% had a partial immigrant background, with one parent born in a foreign country and the other born in Austria. This generally matches the ethnic composition of Austrian students overall (Statistics Austria, 2015). The data was collected in 2011 as part of a larger secondary school teacher training program (see Kollmayer et al., 2019, 2020). Teachers were recruited via phone and email and voluntarily participated in data collection with their classes. The participating students answered an online questionnaire via Unipark (Questback, 2007)

during one school lesson. Written informed consent for students' participation was obtained from their parents in advance, and students could decide for themselves whether they wanted to participate in the data collection. Anonymity and confidentiality of their data were guaranteed.

Measures and Data Preparation

Occupational aspirations

Occupational aspirations were measured with an open-ended question: "Imagine that you could look into the future with a crystal ball and see yourself as an adult in your future career. As what or where do you work?". In a first step, the data was cleaned so that only the name of the occupation, written in grammatically correct form, was contained in each cell (e.g., "as an astrophysicist" was cleaned to "astrophysicist", "in a 5-star hotel as a famous chef!" was cleaned to "chef", etc.). When more than one occupation was named, only the first one was included in the analysis. All answers in which only a place was named (e.g., "in a hospital"), with several occupations being possible (e.g., doctor or nurse in a hospital), were excluded from the data set. In a second step, the named occupations were classified based on the International Standard Classification of Occupations 2008 for Austria (Ö-ISCO 08; Statistics Austria, 2008; 2011). The job information system from the Austrian Public Employment Service (AMS) automatically assigns each occupation to a corresponding ISCO category. If two or more categories were suggested, the first, second and last author discussed the provided options and agreed on the final coding blind to the participants' sex. All occupations were coded at the most detailed level of classification (4 digits), and broader categories (3 and 2 digits) were derived therefrom.

Gender typicality. The percentage of females working in the field (in broader 2-digit ISCO categories) corresponding to each of the named occupations in Austria was identified from

national labor market statistics (Statistics Austria, 2019). Higher values on this continuous variable (ranging from 1.99% for “plumber”, “carpenter”, “chimney sweeper” and other building trades and related occupations to 88.55% for “domestic cleaners and helpers”) indicated more females employed in the field (typically feminine occupations), whereas lower values indicated more males employed in the field (typically masculine occupations). Middle values on the scale indicate an equal percentage of males and females in the field (e.g., 53.51% female for “announcers on radio, television and other media” or 48.53% female for “accountants”).

Prestige. The latest International Socio-Economic Index of Occupational Status (ISEI) (Ganzeboom et al., 1992; 2010) was used to assess the status and prestige level associated with each of the named occupations (on 4-digits ISCO level). The ISEI is an established continuous measure of occupational stratification based on information about required educational qualifications and expected income. It is coded for each of the ISCO occupational categories (ranging from a value of 11.01 for “subsistence farmer” to 88.96 for “judge”). Ganzeboom et al. (1992) found that the performance of the ISEI scale compares favorably to that of other internationally standardized measures of occupational status, namely Treiman’s international prestige scale (SIOPS) and Goldthorpe’s class categories (EGP).

Leadership desire. Spontaneously expressed leadership desire was coded dichotomously with 1 if a leadership desire was expressed and 0 if it was not. Leadership desire was defined as expressed aspiration to a managerial position (CEO, senior government official, director or manager in different industries), as well as the expressed aspiration to own a business and manage a group of people.

Agency and Communion

Participants were asked to spontaneously describe themselves with the instructions: “How would you describe yourself to someone who you do not know yet? Please write down three attributes that describe you best. Please do not describe how you look but describe your personality (an example attribute: honest).” Participants described themselves in an open-ended format by writing down three attributes. The attributes were later coded in terms of agency and communion by independent raters. The raters achieved substantial inter-coder agreement ($\kappa = 0.65$; Landis & Koch, 1977). After the initial coding, they discussed all equivocal attributes and agreed on the final coding for each attribute. The variables indicating agency and communion are the sum of agentic and communal attributes named in a participant’s self-description, respectively (for the detailed coding procedure and results, see Korlat et al., 2021).

Results

Descriptive Analysis

In total, the adolescents spontaneously named 190 unique occupations. The final list with gender typicality and prestige scores for each occupation is presented in Table 1 in the supplementary material. A leadership aspiration was spontaneously expressed in only 214 cases (7.7% of the sample).

Gender Differences in Occupational Aspirations

To investigate differences between boys and girls in the gender typicality of occupational aspirations, three separate analyses of variance (ANOVA) with gender and age as between-

subject factors were conducted. The percentage of females in the field, ISEI prestige score and leadership aspiration served as dependent variables in these three separate analyses.

Gender Typicality

Table 1 presents the means and standard deviations for the gender typicality of the named occupations by gender and age. The results showed a significant main effect of gender, $F(1, 2769) = 339.17, p < .001, \eta^2_p = .109$, with girls ($M = 60.99, SD = 20.41$) naming more typically feminine occupations than boys ($M = 34.43, SD = 24.96$). There was no significant main effect of age, $F(4, 2769) < 1, p > .05$. The interaction effect of gender and age was also non-significant, $F(4, 2769) = 1.70, p > .05$.

Prestige

Table 1 presents the means and standard deviations for the prestige of the named occupations by gender and age. The results showed a significant main effect of gender, $F(1, 2757) = 6.98, p < .01, \eta^2_p = .003$, with girls ($M = 56.07, SD = 23.59$) naming more prestigious occupations than boys ($M = 50.92, SD = 21.45$). The main effect of age was also significant, $F(4, 2757) = 4.07, p < .01, \eta^2_p = .006$. Post hoc tests showed that 11-year-olds ($M = 53.21, SD = 22.52$), 12 ($M = 54.60, SD = 22.94$) and 13-year-olds ($M = 54.17, SD = 22.56$) named more prestigious occupations than 15-year-olds ($M = 41.88, SD = 18.32$). The mean differences between the other age groups were not significant. The interaction effect of gender and age was also non-significant, $F(4, 2757) < 1, p > .05$.

Leadership desire

Table 1 presents the means and standard deviations for leadership desire by gender and age. The results showed a non-significant main effect of gender, $F(1, 2769) = 1.77, p > .05$, a

non-significant main effect of age, $F(4, 2769) = 1.68, p > .05$, as well as non-significant interaction effect between gender and age, $F(4, 2769) = 1.28, p > .05$.

Gender Differences in Spontaneously Named Occupations

To further explore the specific occupations to which boys and girls aspire, a configural frequency analysis (CFA; cf. Lienert, 1969; von Eye, 1990) was conducted. This multivariate approach allows for analyzing the cross-classified, categorical data used in person-oriented research (von Eye, 2008). We applied a two-sample CFA to identify gender differences in the individual occupations named spontaneously by the adolescents. This type of CFA allows researchers to compare two independent groups and identify discrimination types, that is, occupations with higher frequencies in one group than would be expected from the base model (and thus fewer cases than expected in the other group), referred to as types and antitypes, respectively. Thus, CFA is an exploratory analysis with the goal of identifying stand-out cells rather than confirming an existing model (von Eye et al., 2008). The analysis was carried out using the CFA program developed by von Eye (2000). Only occupations that were named more than 10 times were included in the analysis. For the 57 occupations that met this criterion, the significance of the overall model (sampling distribution) was assessed with a χ^2 -test, followed by the identification of potential types and antitypes with Bonferroni-adjusted alpha significance tests.

As presented in Table 2, significant gender differences were found in 23 (40.35%) out of the 57 occupations named more than 10 times. The results of the CFA show that significantly more girls than boys named the following occupations: childcare workers, product and garment designers, veterinarians, primary school teachers, pet groomers and animal care workers, hairdressers, medical doctors (specialists), nursing professionals and pharmacists. Significantly

more boys than girls named the following occupations: athletes and sports players, motor vehicle mechanics and repairers, police officers, agricultural and industrial machinery mechanics and repairers, farming-related jobs, cabinetmakers and related workers, electrical line installers and repairers, information and communications technology operations technicians, software developers, aircraft pilots and related associate professionals, mechanical engineers, plumbers, armed forces, carpenters and joiners. The frequencies of boys and girls naming the occupation, effect sizes of gender differences, percentage of females in the field and prestige scores for each occupation for which a significant difference was found are presented in Table 2.

Mediating Role of Agency and Communion

The role of agency and communion in the stereotyped aspects of occupational aspirations for which gender differences were found was tested by estimating two separate mediation models using the PROCESS macro (Hayes, 2013) that included gender as an independent variable, agency and communion as mediators, and gender typicality and prestige as the two separate outcome variables. As no gender differences were found for leadership desire, the corresponding mediation model is not presented here; an exploratory model for leadership desire found no significant paths. Age was also included as a covariate in all models. Bootstrapping was applied, with coefficients estimated from 5000 bootstraps, to test the indirect effect.

Gender Typicality

Figure 1 shows the paths linking gender to the gender typicality of occupational aspirations via agency and communion. The results showed a statistically significant effect of gender on agency ($a1: B = 0.147, p = .000$) and communion ($a2: B = -0.399, p = .000$), with girls describing themselves using more communal attributes and boys describing themselves using

more agentic attributes. There was also a significant positive effect of communion on percentage of females in the aspired field (b2: $B = 1.603, p = .004$), but no significant effect of agency (b1: $B = 1.023, p = .187$). The direct effect of gender on percentage of females in the aspired field was also significant (c: $B = -26.064, p = .000$), with girls aspiring more frequently to typically feminine occupations and boys aspiring more frequently to typically masculine occupations. The indirect effect data supported a partial mediation for communion [c'2: $B = -0.640, SE = 0.237$, 95% CI (-1.110, -0.178)], but not for agency [c'1: $B = 0.150, SE = 0.118$, 95% CI (-0.073, 0.390)]. The relationship between the covariate age and the outcome variable was not significant ($B = -0.177, p = .682$).

Prestige

Figure 2 shows the paths linking gender to the prestige scores of occupational aspirations via agency and communion. The results showed a statistically significant positive effect of agency on aspired occupational prestige (b1: $B = 2.170, p = .005$), while the effect of communion was not significant (b2: $B = -0.262, p = .634$). The direct effect of gender on aspired occupational prestige was also significant (c: $B = -5.511, p = .000$), with girls aspiring to more prestigious occupations than boys. The indirect effect data supported a partial mediation for agency [c'1: $B = 0.319, SE = 0.130$, 95% CI (0.089, 0.592)], but not for communion [c'2: $B = 0.105, SE = 0.118$, 95% CI (-0.344, 0.517)]. The relationship between the covariate age and the outcome variable was not significant ($B = -0.701, p = .103$).

Discussion

The current study tested gender differences in three gendered aspects of occupational aspirations – gender typicality, prestige and leadership desire – and investigated the role of gender-typed personality traits – agency and communion – as a possible mechanism behind these gender differences. Our results confirmed patterns described in the literature regarding gender differences in occupational aspirations: girls aspire to typically feminine occupations significantly more than boys do, whereas boys aspire to typically masculine occupations significantly more than girls do (Su et al., 2009; Wegemer & Eccles, 2019; Wicht et al., 2021). This pattern is particularly conspicuous in the CFA results, which allowed us to test specific differences between boys and girls. These results showed that the occupations named more frequently by girls are all typically feminine occupations (with the corresponding fields more than 55% female), such as childcare, primary school teaching, nursing and related medical fields. The only exception in which girls outnumbered boys in naming a typically masculine field (26% female) was “product and garment designers”. However, in 76% of the cases involving this field, the specific occupation named was “fashion designer”, whereas only 24% concerned designing other products (such as furniture or cars). Thus, within this typically masculine ISCO occupation in Austria, girls mostly specified design related to fashion and beauty – domains that are stereotypically feminine (e.g., Nam et al., 2011). In general, the occupations more frequently named by girls were related either to beauty (hairdresser) or to helping people (e.g., medical doctors, nurses, school teaching and childcare) and other living beings (e.g., animals), in line with a previous meta-analytic review finding that girls tend to prefer people-oriented jobs involving interpersonal tasks (Su et al., 2009). Our results also aligned with meta-analytic evidence concerning boys' aspirations – all occupations named significantly more often by boys

involved impersonal tasks such as dealing with tools and machines (Su et al., 2009) and were typically masculine (with the corresponding fields more than 55% male), involving aspects such as mechanics, electronics, the building trades, and technology-related occupations. The only exception was the occupation “professional athletes and sports players”, which is a gender balanced occupation in Austria (with the field 53.68% female). However, in 78.8% of the cases involving this field, the participants named “professional football/soccer player” as their aspired occupation, which is more stereotypically masculine (Chalabaev et al., 2013). In the remaining 21.2% of cases, other sports were named: basketball, handball, skiing, (ice)skating, boxing, equestrian, tennis, wrestling, track and field, and swimming. Boys also outnumbered girls with respect to STEM occupations related to information and communications technology, software development and mechanical engineering. This finding is likewise in alignment with previous studies, which have repeatedly shown higher interest and aspirations to these fields among boys (Eccles et al., 2009; Wegemer & Eccles, 2019).

However, despite boys' predominance in STEM-related occupations, our results confirmed prior findings showing that, on average, girls aspire to more prestigious occupations than boys (Rani, 2018; Watts et al., 2015; Wicht, 2016; 2021). The prestige scores of the occupations for which significant differences between boys and girls were found strengthens Wicht et al.'s (2021) argument: Although boys more frequently aspire to highly prestigious STEM-related occupations, the occupations associated with social interests preferred by girls are largely found in the middle to upper-middle range of the occupational status hierarchy (such as medical doctors, pharmacists, veterinarians and teachers). This finding further confirms the need to distinguish between STEM fields in which women are well-represented (health, biological, and medical sciences; HBMS) and those in which women are not (mathematics, physical,

engineering, and computer sciences; MPECS; Wegemer & Eccles, 2019), which can be helpful in developing strategies to combat gender segregation in the labor market (Eccles & Wang, 2016). At the same time, some typically masculine occupations aspired to by boys are on the lower end of the prestige hierarchy (such as carpenters, plumbers and farmers), confirming Wicht's et al. (2021) notion that boys' interest in typically masculine occupations outside of STEM undermines the higher position on the prestige hierarchy that STEM occupations could provide.

Although previous studies showed adolescent girls to be more likely than adolescent boys to aspire to managerial jobs (Mello, 2008; Schoon, 2006; Schoon et al., 2007), our results did not reveal significant differences between boys and girls in spontaneously expressed aspirations to leadership or managerial positions. In fact, only 7.7% of the whole sample expressed such aspirations spontaneously, which shows that neither boys nor girls from our study are likely to think about leadership positions as a career option when not explicitly asked about them. However, despite girls' higher aspirations regarding occupational prestige, and equal aspirations regarding leadership and managerial positions, women in the labor market are still underrepresented in those positions and earn less compared to men (European Commission, 2017; WEF, 2017). Our results thus underscore the notion that girls probably face occupational barriers that hinder them from realizing their aspirations, which are equal to or higher than those of adolescent boys. This emphasizes the need to better understand which (gender-related) factors contribute to the gender division of labor in reality.

In line with these considerations, the second objective of this study focused on the role of gender-typed personality traits – which are grafted onto girls' and boys' self-concept and identity through gendered socialization – in gendered occupational aspirations (Eccles et al., 2007, 2009).

The results only partially confirmed our assumptions. Namely, communion was a significant mediator between gender and aspiring to typically feminine occupations, thus partially explaining girls' preference for typically feminine choices. For these adolescent girls, social occupational preferences, which are stereotypically feminine occupations requiring communal traits, are congruent with their gender self-concept (Diekmann et al., 2017; Eccles et al., 2007; Gottfredson et al., 2005). However, agency was found to be an insignificant mediator between gender and the gender typicality of occupational aspirations. One explanation for these finding could be that communal characteristics are currently perceived as more required in typically feminine occupations than agentic qualities are required in typically masculine occupations: In order to work a people-oriented job involving interpersonal tasks, one must perceive and describe the self as a "people person". Conversely, masculine occupations involving impersonal tasks such as dealing with tools and machines might not require the agentic attributes used in boys' self-descriptions (e.g., intelligent, strong, sporty). Another explanation could lie in recent findings showing that agency can be subdivided into two facets – ability/competence and volition/assertiveness (Abele & Hauke, 2019), and that these two facets can be perceived directly opposite by others – one can be perceived as less assertive, but more competent, and vice versa (e.g., Hauke-Forman et al., 2021; Methner et al., 2020). Thus, a similar mechanism might have been at play in the participants' self-descriptions and their relations to the gender typicality of occupational aspirations: The adolescents who described themselves with agentic attributes might have used attributes indicating either assertiveness or competence, which could have played different roles in the gender typicality of aspirations and cancelled out each other's influence. Further research is needed to examine these different aspects of agency in occupational aspirations and choices. Moreover, the adolescent boys and girls in our study used

more communal than agentic words in their self-descriptions in general (for a detailed review of results, see Korlat et al., 2021), which could have contributed to the insignificance of agency in the model.

On the other hand, agency has been found to mediate the relationship between gender and occupational prestige, indicating the importance of agentic qualities for aspirations to higher-status jobs in a society. In other words, socially prestigious jobs (such as judges, lawyers and scientists) might require high agency (e.g., seeing oneself as competent, decisive, dominant), but not communion. Moreover, this finding underscores the importance of agency in girls' self-concepts for their aspirations to high-status jobs. Surprisingly, leadership aspirations were not at all related to agency and communion in our study, but this might have been due to the low percentage of participants expressing leadership desire. Further research is needed to investigate expressed leadership desire and its connection to agency and communion in adolescence.

Although previous studies have argued that today's boys and girls might represent new cohorts moving toward a post-gender culture due to their increasingly gender-neutral self-descriptions (Donnelly & Twenge, 2017; Helgeson, 2015; Korlat et al., 2021), this study, in line with others from this research field, indicates the continuing presence of gender stereotypes in career-related aspirations. Despite some changes in identities experienced by newer generations of adolescents, one's professional identity is one's most visible and public social role, and deviation from societally expected aspirations and choices in this area could be riskier than others. Therefore, changes in gender-typed occupational aspirations and behavior could potentially require larger systematic changes enabling gender similarities in adolescence to persist through adulthood and securing equal work opportunities and life chances for men and women.

Limitations and Future Directions

Although this study has several strengths, including its large dataset and measurement of the mediating roles of agency and communion using the spontaneous self-description method, the present findings are still correlational in nature and do not allow for causal inference. Future studies should investigate the role of agency and communion in adolescents' self-concepts longitudinally or experimentally in order to draw conclusions on the specific causal relationship between gender-typed personality traits and occupational aspirations. Moreover, in our study, participants were asked to describe themselves using a maximum of three attributes, which might have restricted the scope of our data and limited data coding possibilities. Future studies should also expand research on the role of agency and communion in occupational aspirations and choices using the spontaneous self-description method by accounting for different facets of these two gender-typed personality traits. Finally, in order to reduce the impact of gender stereotypes on occupational aspirations in adolescence, school-based programs could be developed to openly discuss the underlying mechanisms leading to stereotypical occupational aspirations and help adolescents consider careers that match their individual competencies rather than their internalized gender role beliefs (e.g., Steiner et al., 2014).

Funding

This research was partially supported by the following Austrian federal ministries: Education, the Arts and Culture; Women and Public Service; Transport, Innovation and Technology; Labor, Social Affairs and Consumer Protection; Family and Youth.

References

- Abele, A. E. (2003). The dynamics of masculine-agentive and feminine-communal traits: Findings from a prospective study. *Journal of Personality and Social Psychology*, 85(4), 768–776. <https://doi-org/10.1037/0022-3514.85.4.768>
- Abele, A. E., & Hauke, N. (2019). Comparing the facets of the Big Two in global evaluation of self versus other people. *European Journal of Social Psychology*, 50, 969–982. <https://doi.org/10.1002/ejsp.2639>
- Ashby, J. S., & Schoon, I. (2010). Career success: The role of teenage career aspirations, ambition value and gender in predicting adult social status and earnings. *Journal of Vocational Behavior*, 77(3), 350–360. <https://doi.org/10.1016/j.jvb.2010.06.006>
- Austria's Agency for Education and Internationalization (2021). Austrian Educational System. Retrieved on April 12, 2021, from <https://www.bildungssystem.at/>
- Bandura, A., Barbaranelli, C., Caprara, G. V., & Pastorelli, C. (2001). Self-efficacy beliefs as shapers of children's aspirations and career trajectories. *Child development*, 72(1), 187–206. <https://doi.org/10.1111/1467-8624.00273>
- Bem, Sandra L. (1974). The measurement of psychological androgyny. *Journal of Consulting and Clinical Psychology*, 42(2), 155–162. <https://doi.org/10.1037/h0036215>
- Boldizar, J. P. (1991). Assessing sex typing and androgyny in children: The Children's Sex Role Inventory. *Developmental Psychology*, 27(3), 505–515. <https://doi.org/10.1037/0012-1649.27.3.505>
- Brinthaup, T. M., & Erwin, L. J. (1992). *Reporting about the self: Issues and implications*. In *SUNY Series, Studying the Self. The self: Definitional and methodological issues* (pp. 137–171). State University of New York Press.
- Bubany, S. T., & Hansen, J.-I. C. (2011). Birth cohort change in the vocational interests of female and male college students. *Journal of Vocational Behavior*, 78(1), 59–67. <https://doi-org/10.1016/j.jvb.2010.08.002>
- Carli, L.L., Eagly, A. H. (2016). Women face a labyrinth: an examination of metaphors for women leaders. *Gender in Management*, 31(8), 514–527. <https://doi-org/10.1108/GM-02-2015-0007>

- Chalabaev, A., Sarrazin, P., Fontayne, P., Boiché, J., & Clément-Guillotin, C. (2013). The influence of sex stereotypes and gender roles on participation and performance in sport and exercise: Review and future directions. *Psychology of Sport and Exercise, 14*. 136-144. <https://doi-org/10.1016/j.psychsport.2012.10.005>.
- Choudhury, S., Blakemore, S.-J., & Charman, T. (2006). Social cognitive development during adolescence. *Social Cognitive and Affective Neuroscience, 1*(3), 165–174. <https://doi.org/10.1093/scan/nsl024>
- Cinamon, R. G., & Rich, Y. (2002). Gender differences in the importance of work and family roles: Implications for work-family conflict. *Sex Roles: A Journal of Research, 47*(11-12), 531–541. <https://doi-org/10.1023/A:1022021804846>
- Cochran, D.B., Wang, E.W., Stevenson, S.J., Johnson, L.E. and Crews, C. (2011), Adolescent Occupational Aspirations: Test of Gottfredson's Theory of Circumscription and Compromise. *The Career Development Quarterly, 59*, 412-427. <https://doi-org/10.1002/j.2161-0045.2011.tb00968.x>
- Correll, S. J. (2004). Constraints into Preferences: Gender, Status, and Emerging Career Aspirations. *American Sociological Review, 69*(1), 93–113. <https://doi.org/10.1177/000312240406900106>
- Cowan, M. L., & Stewart, B. J. (1977). A methodological study of sex stereotypes. *Sex Roles, 3*(3), 205–216. <https://doi.org/10.1007/BF00287610>
- Croft, A., Schmader, T., and Block, K. (2015). An underexamined inequality: cultural and psychological barriers to men's engagement with communal roles. *Pers. Soc. Psychol. Rev., 19*, 343–370. <https://doi.org/10.1177/1088868314564789>
- Diekman, A. B., Steinberg, M., Brown, E. R., Belanger, A. L., & Clark, E. K. (2017). A Goal Congruity Model of Role Entry, Engagement, and Exit: Understanding Communal Goal Processes in STEM Gender Gaps. *Personality and Social Psychology Review, 21*(2), 142–175. <https://doi.org/10.1177/1088868316642141>
- Diekman, A. B., Clark, E. K., Johnston, A. M., Brown, E. R., & Steinberg, M. (2011). Malleability in communal goals and beliefs influences attraction to stem careers: Evidence for a goal congruity perspective. *Journal of Personality and Social Psychology, 101*(5), 902–918. <https://doi-org/10.1037/a0025199>

- Diekmann, A. B., Brown, E. R., Johnston, A. M., & Clark, E. K. (2010). Seeking Congruity Between Goals and Roles: A New Look at Why Women Opt Out of Science, Technology, Engineering, and Mathematics Careers. *Psychological Science*, 21(8), 1051–1057. <https://doi.org/10.1177/0956797610377342>
- Dinella, L. M., Fulcher, M., & Weisgram, E. S. (2014). Sex-typed personality traits and gender identity as predictors of young adults' career interests. *Archives of Sexual Behaviour*, 43, 493–504.
- Donnelly, K., & Twenge, J. M. (2017). Masculine and feminine traits on the Bem Sex-Role Inventory, 1993–2012: A cross-temporal meta-analysis. *Sex Roles: A Journal of Research*, 76(9-10), 556–565. <https://doi.org/10.1007/s11199-016-0625-y>
- Eagly, A. H., & Wood, W. (2012). *Social role theory*. In P. A. M. Van Lange, A. W. Kruglanski, & E. T. Higgins (Eds.), *Handbook of theories of social psychology* (pp. 458-476). Thousand Oaks, CA: Sage Publications Ltd. <https://doi.org/10.4135/9781446249222.n49>
- Eagly, A. H., & Karau, S. J. (2002). Role congruity theory of prejudice toward female leaders. *Psychological Review*, 109(3), 573–598. <https://doi-org/10.1037/0033-295X.109.3.573>
- Eccles, J.S. (2009). Who am I and what am I going to do with my life? Personal and collective identities as motivators of action. *Educational Psychologist*, 44, 78-89.
- Eccles, J. S. (2007). *Where are all the women? Gender differences in participation in physical science and engineering*. In S. J. Ceci & W. M. Williams (Eds.), *Why aren't more women in science? Top researchers debate the evidence* (pp. 199–210). American Psychological Association.
- Eccles, J. S. (1994). Understanding women's educational and occupational choices. *Psychology of Women Quarterly*, 18, 585–609. <https://doi.org/10.1111/j.1471-6402.1994.tb01049.x>
- Eccles-Parsons, J. S., Adler, T. F., Futterman, R., Goff, S. B., Kaczala, C. M., Meece, J. L., et al. (1983). Expectancies, values, and academic behaviors. In J. T. Spence (Ed.), *Achievement and achievement motivation* (pp. 75–146). W. H. Freeman.
- Forsman, J. A., & Barth, J. M. (2017). The effect of occupational gender stereotypes on men's interest in female-dominated occupations. *Sex Roles: A Journal of Research*, 76(7-8), 460–472. <https://doi-org/10.1007/s11199-016-0673-3>
- Freund, A. M., Weiss, D., & Wiese, B. S. (2013). Graduating from high school: The role of gender-related attitudes, self-concept and goal clarity in a major transition in late

- adolescence. *European Journal of Developmental Psychology*, 10(5), 580–596.
<https://doi-org/10.1080/17405629.2013.772508>
- Ganzeboom, H. B. G., De Graaf, P. M., & Treiman, D. J. (1992). A standard international socio-economic index of occupational status. *Social Science Research*, 21(1), 1-56.
[https://doi.org/10.1016/0049-089X\(92\)90017-B](https://doi.org/10.1016/0049-089X(92)90017-B)
- Ganzeboom, H. B. G. (2010), “A new International Socio-Economic Index (ISEI) of occupational status for the International Standard Classification of Occupations 2008 (ISCO-08) constructed with data from the ISSP 2002–2007”, paper presented at the annual meeting of the International Social Survey Programme, Lisbon, Portugal.
- Gottfredson, L. S. (2005). *Applying Gottfredson's Theory of Circumscription and Compromise in Career Guidance and Counseling*. In S. D. Brown & R. W. Lent (Eds.), *Career development and counseling: Putting theory and research to work* (p. 71–100). John Wiley & Sons, Inc.
- Gottfredson, L. S. (1981). Circumscription and compromise: A developmental theory of occupational aspirations. *Journal of Counseling Psychology*, 28(6), 545–579. <https://doi-org/10.1037/0022-0167.28.6.545>
- Gutman, L. M., & Akerman, R. (2008). *Determinants of aspirations* [Research Report]. Centre for Research on the Wider Benefits of Learning.
- Hadjar, A., & Aeschlimann, B. (2015). Gender stereotypes and gendered vocational aspirations among Swiss secondary school students. *Educational Research*, 57(1), 22-42,
<https://doi.org/10.1080/00131881.2014.983719>
- Hartung, P. J., Porfeli, E. J., & Vondracek, F. W. (2005). Child vocational development: A review and reconsideration. *Journal of Vocational Behavior*, 66(3), 385–419. <https://doi-org.uaccess.univie.ac.at/10.1016/j.jvb.2004.05.006>
- Hayes, A. F. (2013). *Methodology in the social sciences. Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. Guilford Press.
- Helgeson, V. S. (2015). *Gender and personality*. In M. Mikulincer, P. R. Shaver, L. M. Cooper, & R. J. Larsen (Eds.), *APA handbook of personality and social psychology (Personality processes and individual differences, Vol. 4, pp. 515–534)*. American Psychological Association. <https://doi.org/10.1037/14343-000>

- Heilman, M. E. (2012). Gender stereotypes and workplace bias. *Res. Organ. Behav*, 32, 113–135. <https://doi.org/10.1016/j.riob.2012.11.003>
- Hill, J. P., & Lynch, M. E. (1983). *The Intensification of Gender-Related Role Expectations during Early Adolescence*. In J. Brooks-Gunn & A. C. Petersen (Eds.), *Girls at Puberty: Biological and Psychosocial Perspectives* (pp. 201–228). https://doi.org/10.1007/978-1-4899-0354-9_10
- Hulin, C. L. (2002). *Lessons from industrial and organizational psychology*. In J. M. Brett & F. Drasgow (Eds.), *The psychology of work: Theoretically based empirical research* (pp. 3–22). Erlbaum.
- Koenig, A. M., Eagly, A. H., Mitchell, A. A., & Ristikari, T. (2011). Are leader stereotypes masculine? A meta-analysis of three research paradigms. *Psychological bulletin*, 137(4), 616–642. <https://doi.org/10.1037/a0023557>
- Konrad, A. M., Ritchie, J. E., Jr, Lieb, P., & Corrigan, E. (2000). Sex differences and similarities in job attribute preferences: a meta-analysis. *Psychological bulletin*, 126(4), 593–641. <https://doi.org/10.1037/0033-2909.126.4.593>
- Kollmayer, M. Pfaffel, A., Schultes, M.-T., Lüftenegger, M., Finsterwald, M., Popper, V., Jöstl, G., Spiel, C., & Schober, B. (2019). REFLECT – ein Interventionsprogramm zum Aufbau von Lehrkräftekompetenzen für Reflexive Koedukation. *Zeitschrift für Entwicklungspsychologie und Pädagogische Psychologie*.
- Kollmayer M., Schultes M.-T., Lüftenegger M., Finsterwald M., Spiel C., & Schober B. (2020). REFLECT – A Teacher Training Program to Promote Gender Equality in Schools. *Frontiers in Education*, 5:136. <https://doi.org/10.3389/feduc.2020.00136>
- Korlat, S., Foerst, N.M., Schultes, M.-T., Schober, B., Spiel, C., & Kollmayer, M. (2021). Gender Role Identity and Gender Intensification: Agency and Communion in Adolescents' Spontaneous Self-Descriptions. *European Journal of Developmental Psychology*. Advance Online Publication. <https://doi.org/10.1080/17405629.2020.1865143>
- Landis, J. R., & Koch, G. G. (1977). The measurement of observer agreement for categorical data. *Biometrics*, 159-174.
- Leaper, C., & Van, S. R. (2008). Masculinity ideology, covert sexism, and perceived gender typicality in relation to young men's academic motivation and choices in college.

- Psychology of Men & Masculinity*, 9(3), 139–153. <https://doi-org/10.1037/1524-9220.9.3.139>
- Lienert, G. A. (1969). Configural frequency analysis as a classification method in clinical psychology. In Irle, M. (ed.). Bericht über den 26. Kongress der Deutschen Gesellschaft für Psychologie in Tübingen 1968. Hogrefe. pp. 244–253.
- Lyness, K. S., & Heilman, M. E. (2006). When fit is fundamental: Performance evaluations and promotions of upper-level female and male managers. *Journal of Applied Psychology*, 91(4), 777–785. <https://doi-org/10.1037/0021-9010.91.4.777>
- Makarova, E., Aeschlimann, B. & Herzog, W. (2019). The Gender Gap in STEM Fields: The Impact of the Gender Stereotype of Math and Science on Secondary Students' Career Aspirations. *Front. Educ.* 4:60. <https://doi.org/10.3389/feduc.2019.00060>
- Mau, W.-C., & Bikos, L. H. (2000). Educational and vocational aspirations of minority and female students: A longitudinal study. *Journal of Counseling & Development*, 78(2), 186–194. <https://doi-org/10.1002/j.1556-6676.2000.tb02577.x>
- McGuire, W. J., & McGuire, C. V. (1988). *Content and Process in the Experience of Self*. In L. Berkowitz (Ed.), *Advances in Experimental Social Psychology*, 21, 97–144. [https://doi-org/10.1016/S0065-2601\(08\)60225-7](https://doi-org/10.1016/S0065-2601(08)60225-7)
- McGuire, W. J., & McGuire, C. V. (1982). *Significant others in self-space: Sex differences and developmental trends in social self*. In J. Suls (Ed.), *Psychological perspectives on the self* (Vol. 1, pp. 71-96). Erlbaum.
- McGuire, W. J., & Padawer-Singer, A. (1976). Trait salience in the spontaneous self-concept. *Journal of Personality and Social Psychology*, 33(6), 743–754. <https://doi-org/10.1037/0022-3514.33.6.743>
- Mello, Z. R. (2008). Gender variation in developmental trajectories of educational and occupational expectations and attainment from adolescence to adulthood. *Developmental Psychology*, 44(4), 1069–1080. <https://doi-org/10.1037/0012-1649.44.4.1069>
- Moradi, B., & Parent, M. C. (2013). *Assessment of gender-related traits, attitudes, roles, norms, identity, and experiences*. In K. F. Geisinger, B. A. Bracken, J. F. Carlson, J.-I. C. Hansen, N. R. Kuncel, S. P. Reise, & M. C. Rodriguez (Eds.), *APA handbooks in psychology®. APA handbook of testing and assessment in psychology*, Vol. 2. Testing

- and assessment in clinical and counseling psychology (p. 467–488). American Psychological Association. <https://doi-org/10.1037/14048-027>
- Nam, K., Lee, G., & Hwang, J. (2011). Gender Stereotypes Depicted by Western and Korean Advertising Models in Korean Adolescent Girls' Magazines. *Sex Roles*, 64, 223-237. <https://doi-org/10.1007/s11199-010-9878-z>
- Nurmi, J. E. (2004). *Socialization and Self-development: Channeling, Selection, Adjustment, and Reflection*. In Handbook of Adolescent Psychology. 2nd ed, edited by R. Lerner, and L. Steinberg, 85–124. Wiley.
- OECD (2012). Closing the Gap. Act Now. OECD Publishing. <https://doi.org/10.1787/9789264179370-en>
- OECD (2017). The Pursuit of Gender Equality: An Uphill Battle. OECD Publishing. <https://doi.org/10.1787/9789264281318-en>
- Perry, J. C., & Vance, K. S. (2010). Possible selves among urban youths of color: An exploration of peer beliefs and gender differences. *The Career Development Quarterly*, 58(3), 257–269. <https://doi.org/10.1002/j.2161-0045.2010.tb00191.x>
- Mendez, L. M. R., & Crawford, K. M. (2002). Gender-Role Stereotyping and Career Aspirations: A Comparison of Gifted Early Adolescent Boys and Girls. *Journal of Secondary Gifted Education*, 13(3), 96–107. <https://doi.org/10.4219/jsge-2002-375>
- Questback GmbH. (2016). Unipark (EFS Fall 2016). Questback GmbH.
- Ramaci, T., Pellerone, M., Ledda, C., Presti, G., Squatrito, V., & Rapisarda, V. (2017). Gender stereotypes in occupational choice: a cross-sectional study on a group of Italian adolescents. *Psychology research and behavior management*, 10, 109–117. <https://doi.org/10.2147/PRBM.S134132>
- Rani, D. (2018). Adolescents career aspirations, gender and socio-economic status. *Journal of Advances and Scholarly Researches in Allied Education*, 15(8), 37–46.
- Richway, C., L. & Correll, S., J. (2004). Unpacking the gender system: A theoretical perspective on gender beliefs and social relations. *Gender & Society*, 18, 510-531.
- Rosette, A. S., & Tost, L. P. (2010). Agentic women and communal leadership: How role prescriptions confer advantage to top women leaders. *Journal of Applied Psychology*, 95(2), 221–235. <https://doi-org/10.1037/a0018204>

- Schoon, I., Martin, P., & Ross, A. (2007). Career transitions intimates of social change. His and her story. *Journal of Vocational Behavior*, 70, 78-96.
- Schoon, I., & Polek, E. (2011). Teenage career aspirations and adult career attainment: The role of gender, social background and general cognitive ability. *International Journal of Behavioral Development*, 35(3), 210–217. <https://doi.org/10.1177/0165025411398183>
- Schein, V. E. (2001). A global look at psychological barriers to women's progress in management. *Journal of Social issues*, 57(4), 675-688.
- Sczesny, S. (2003). A closer look beneath the surface: Various facets of the think-manager–think-male stereotype. *Sex roles*, 49(7), 353-363.
- Schock, A-K., Gruber, F., Scherndl, T., & Ortner, T. (2018). Tempering agency with communion increases women's leadership emergence in all-women groups: Evidence for role congruity theory in a field setting. *The Leadership Quarterly*, 30. 189–198. <https://doi.org/10.1016/j.leaqua.2018.08.003>.
- Shapka, J. D., Domene, J.F., & Keating, D.P. (2006) Trajectories of career aspirations through adolescence and young adulthood: Early math achievement as a critical filter. *Educational Research and Evaluation*, 12:4, 347-358. <https://doi.org/10.1080/13803610600765752>
- Sheppard, L. D. (2018). Gender differences in leadership aspirations and job and life attribute preferences among U.S. undergraduate students. *Sex Roles: A Journal of Research*, 79(9-10), 565–577. <https://doi-org/10.1007/s11199-017-0890-4>
- Sinclair, S., Nilsson, A., Cederskär, E. (2019). Explaining gender-typed educational choice in adolescence: The role of social identity, self-concept, goals, grades, and interests. *Journal of Vocational Behavior*, 110(Part A), 54-71. <https://doi.org/10.1016/j.jvb.2018.11.007>
- Statistics Austria (2015). Migration and integration. Retrieved March 29, 2021, from https://www.integrationsfonds.at/fileadmin/content/Statistisches_Jahrbuch_migration_integration_2015_.pdf
- Statistics Austria (2008). Ö-ISCO 08. Retrieved March 29, 202, from https://www.statistik.at/web_de/services/publikationen/611/index.html?includePage=detailView§ionName=Klassifikationen%2C+Systematiken&pubId=632
- Steiner, F., Jirku, E., Patzak, A., Schultes, M.-T., Jöstl, G., & Spiel, C. (2014, April). Musste Bob Baumeister werden? generation@work, SchülerInnenprogramm zum Erlernen eines

- bewussten Umgangs mit Geschlechtsstereotypen auf dem Weg zur Berufswahl [Did Bob have to become a builder? generation@work, A student program promoting awareness of gender stereotypes in professional choices]. Poster presented at the 11th Conference of the Austrian Society of Psychology in Vienna, Austria.
- Su, R., Rounds, J., & Armstrong, P. I. (2009). Men and things, women and people: A meta-analysis of sex differences in interests. *Psychological Bulletin*, 135(6), 859–884. <https://doi.org/10.1037/a0017364>
- Uchrowski, M. (2008). Agency and communion in spontaneous self-descriptions: Occurrence and situational malleability. *European Journal of Social Psychology*, 38(7), 1093–1102. <https://doi-org/10.1002/ejsp.563>
- Van Grootel, S., Van Laar, C., Meeussen, L., Schmader, T., & Sczesny, S. (2018). Uncovering Pluralistic Ignorance to Change Men's Communal Self-descriptions, Attitudes, and Behavioral Intentions. *Front. Psychol.* 9:1344. <https://doi.org/10.3389/fpsyg.2018.01344>
- von Eye, A. (1990). Introduction to Configural Frequency Analysis: The Search for Types and Antitypes in Cross-Classification. Cambridge University Press.
- von Eye, A., Mun, E. Y., & Bogat, G. A. (2008). Temporal patterns of variable relationships in person-oriented research: Longitudinal models of configural frequency analysis. *Developmental Psychology*, 44(2), 437–445. <https://doi.org/10.1037/0012-1649.44.2.437>.
- Watts, L. L., Frame, M. C., Moffett, R. G., Van Hein, J. L., & Hein, M. (2015). The Relationship between gender, perceived career barriers, and occupational aspirations. *Journal of Applied Physiology*, 45(1), 10–22. <https://doi.org/10.1111/jasp.12271>
- WEF (2017). The Global Gender Gap Report. WEF. Retrieved March 29, 2021, from https://www3.weforum.org/docs/WEF_GGGR_2017.pdf
- Wegemer, C. M., & Eccles, J. S. (2019). Gendered STEM career choices: Altruistic values, beliefs, and identity. *Journal of Vocational Behavior*, 110(Part A), 28–42. <https://doi-org/10.1016/j.jvb.2018.10.020>
- Weisgram, E. S., Dinella, L. M., & Fulcher, M. (2011). The role of masculinity/femininity, values, and occupational value affordances in shaping young men's and women's occupational choices. *Sex Roles: A Journal of Research*, 65(3-4), 243–258. <https://doi-org/10.1007/s11199-011-9998-0>

- Weisgram, E.S., Bigler, R.S. & Liben, L.S. (2010), Gender, Values, and Occupational Interests Among Children, Adolescents, and Adults. *Child Development*, 81, 778-796. <https://doi.org/10.1111/j.1467-8624.2010.01433.x>
- Wicht, A. (2016). Occupational aspirations and ethnic school segregation: Social contagion effects among native German and immigrant youths. *Journal of Ethnic and Migration Studies*, 42(11), 1825–1845. <http://doi.org/10.1080/1369183X.2016.1149455>
- Wicht, A., Miyamoto, A., & Lechner, C. M. (2021). Are Girls More Ambitious Than Boys? Vocational Interests Partly Explain Gender Differences in Occupational Aspirations. *Journal of Career Development*, 1-18. <https://doi.org/10.1177/0894845321991665>

Table 1

Means and standard deviations for gender typicality, prestige and leadership desire in adolescents' occupational aspirations by gender and age

Age	Boys			Girls		
	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>
Gender Typicality						
11	252	36.87	24.21	285	60.44	19.89
12	408	34.27	24.07	458	60.06	21.00
13	464	33.48	24.69	482	61.21	20.60
14	214	34.82	27.45	172	63.34	19.42
15	23	26.47	28.97	21	64.71	17.50
Prestige						
11	251	49.27	19.85	285	56.67	24.15
12	406	52.56	22.49	458	56.42	23.20
13	460	51.79	21.05	480	56.44	23.71
14	212	48.75	22.15	172	54.88	23.35
15	23	42.53	17.21	20	41.13	19.95
Leadership desire						
11	252	.07	.26	285	.05	.22
12	408	.06	.24	458	.07	.26
13	464	.10	.30	482	.08	.27
14	214	.12	.32	172	.06	.25
15	23	.09	.29	21	.05	.22

Table 2

Frequencies of boys and girls naming occupations for which significant differences were found

Occupations (ISCO code)	<i>Occupations named more frequently by boys</i>					
	Boys (f)	Girls (f)	χ^2 *	w	% female in the field	Prestige (ISEI score)
Professional athletes and sports players (3421)	108	10	93.23	0.89	53.68	50.90
Motor vehicle mechanics and repairers (7231)	88	4	85.77	0.97	4.59	30.78
Police officers (5412)	53	16	22.75	0.57	21.64	51.50
Agricultural and industrial machinery mechanics and repairers (7233)	59	0	63.88	1.04	4.59	31.72
Farming-related jobs (6130)	37	14	11.77	0.48	39.39	17.79
Cabinetmakers and related workers (7522)	40	5	29.34	0.81	33.32	25.23
Electrical line installers and repairers (7413)	33	1	31.54	0.96	2.78	39.45
Information and communications technology operations technicians (3511)	32	1	30.42	0.96	14.76	61.07
Software developers (2512)	29	3	22.10	0.83	15.28	74.66
Aircraft pilots and related associate professionals (3153)	27	2	22.32	0.88	8.36	73.71
Mechanical engineers (2144)	23	0	23.27	1.01	25.86	77.10
Plumbers (7126)	16	1	12.84	0.87	1.99	29.16
Armed forces (0)	16	0	15.53	0.99	4.09	51.25
Carpenters and joiners (7115)	12	0	11.14	0.96	1.99	26.62

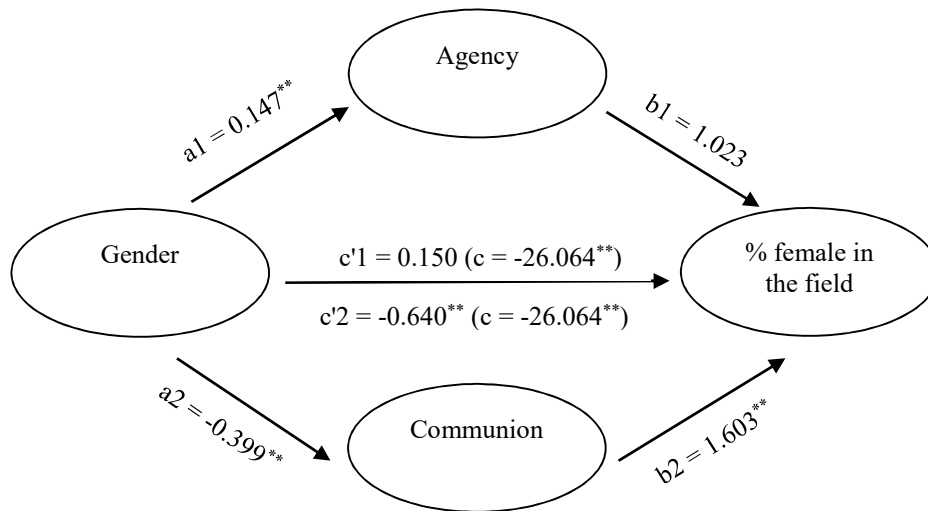
Occupation (ISCO code)	<i>Occupations named more frequently by girls</i>					
	Boys (f)	Girls (f)	χ^2 *	w	% females in the field	Prestige (ISEI score)
Childcare workers (5311)	5	160	140.81	0.92	87.61	24.98
Product and garment designers (2163)	7	62	38.92	0.75	25.86	79.74
Veterinarians (2250)	6	60	39.26	0.77	75.19	84.14
Primary school teachers (2341)	4	57	41.07	0.82	73.61	76.49
Pet groomers and animal care workers (5164)	10	47	20.25	0.60	58.40	30.59
Hairdressers (5141)	2	54	43.23	0.88	58.40	31.08
Medical doctors – specialists (2212)	10	36	11.76	0.51	75.19	81.92
Nursing professionals (2221)	4	41	26.31	0.76	75.19	68.70
Pharmacists (2262)	1	27	20.49	0.86	75.19	81.13

Note. Cohen's w - index of effect size for the goodness of fit test.

* all $ps < 0.01$

Figure 1

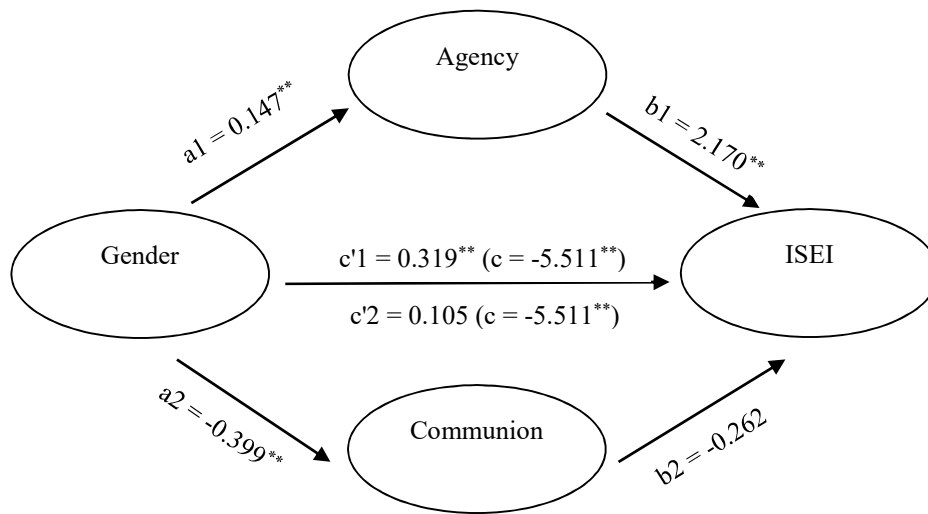
Simple mediation diagram: a, b, c and c' are path coefficients representing unstandardized regression weights.



Note. The c path coefficient represents the direct effect of gender on the gender typicality of aspired occupation (operationalized as percentage of the field that is female). The c' path coefficient refers to the effect of gender on the gender typicality of aspired occupation when the mediator agency (c'1) or communion (c'2) is included in the model. Gender is coded dichotomously (0 = female, 1 = male). All significant paths are marked with ** if $p < .01$, and with * if $p < .05$.

Figure 2

Simple mediation diagram: a, b, c and c' are path coefficients representing unstandardized regression weights.



Note. The c path coefficient represents the direct effect of gender on prestige of aspired occupation (operationalized as ISEI score). The c' path coefficient refers to the effect of gender on prestige of aspired occupation when the mediator agency (c'1) or communion (c'2) is included in the model. Gender is coded dichotomously (0 = female, 1 = male). All significant paths are marked with ** if $p < .01$, and with * if $p < .05$.

Supplementary Table 1

List of all named occupations with corresponding ISCO category, frequency of boys and girls who named it, percentage of males and females in the field and ISEI prestige score

ISCO code	ISCO description	Girls (f)	Boys (f)	% of males in the field	% of females in the field	ISEI prestige score
0	Armed forces occupations	0	16	95.91	4.09	51.25
1120	Managing directors and chief executives	1	3	80.39	19.61	70.34
1221	Sales and marketing managers	1	4	64.42	35.58	71.39
1222	Advertising and public relations managers	0	1	64.42	35.58	75.25
1223	Research and development managers	1	0	64.42	35.58	81.92
1321	Manufacturing managers	0	1	75.63	24.37	65.42
1323	Construction managers	0	6	75.63	24.37	59.89
1330	Information and communications technology service managers	1	6	75.63	24.37	78.86
1342	Health services managers	3	1	75.63	24.37	65.01
1344	Social welfare managers	1	0	75.63	24.37	65.01
1345	Education managers	1	0	75.63	24.37	65.01
1346	Financial and insurance services branch managers	0	3	75.63	24.37	65.01
1349	Professional services managers not elsewhere classified	14	30	75.63	24.37	65.01
1411	Hotel managers	15	6	57.49	42.51	43.85
1412	Restaurant managers	3	4	57.49	42.51	43.85
1420	Retail and wholesale trade managers	13	14	57.49	42.51	51.56
1431	Sports, recreation and cultural centre managers	2	1	57.49	42.51	51.01
1439	Service managers not elsewhere classified	0	1	57.49	42.51	51.01
2110	Physicals and earth science professionals	2	3	74.14	25.86	84.16
2111	Physicists and astronomers	0	11	74.14	25.86	84.61
2112	Meteorologists	0	2	74.14	25.86	84.61
2113	Chemists	3	4	74.14	25.86	83.5
2114	Geologists and geophysicists	1	2	74.14	25.86	86.81
2120	Mathematicians, actuaries and statisticians	1	0	74.14	25.86	81.78
2131	Biologists, botanists, zoologists and related professionals	5	4	74.14	25.86	80.46
2142	Civil engineers	0	3	74.14	25.86	81.4
2143	Environmental engineers	0	1	74.14	25.86	79.05

Adolescents' Gender Role Identity and Occupational Aspirations

2144	Mechanical engineers	0	23	74.14	25.86	77.1
2149	Engineering professionals not elsewhere classified	3	12	74.14	25.86	78.69
2161	Building architects	60	59	74.14	25.86	79.74
2162	Landscape architects	1	0	74.14	25.86	79.74
2163	Product and garment designers	62	7	74.14	25.86	79.74
2164	Town and traffic planners	2	0	74.14	25.86	79.74
2166	Graphic and multimedia designers	8	9	74.14	25.86	79.74
2211	Generalist medical practitioners	43	25	24.81	75.19	88.7
2212	Specialist medical practitioner	36	10	24.81	75.19	81.92
2221	Nursing professionals	41	4	24.81	75.19	68.7
2222	Midwifery professionals	13	0	24.81	75.19	68.7
2250	Veterinarians	60	6	24.81	75.19	84.14
2261	Dentists	6	4	24.81	75.19	88.31
2262	Pharmacists	27	1	24.81	75.19	81.13
2264	Physiotherapists	4	0	24.81	75.19	67.94
2265	Dieticians and nutritionists	1	0	24.81	75.19	65.23
2266	Audiologists and speech therapists	2	0	24.81	75.19	75.43
2269	Health professionals not elsewhere classified	0	1	24.81	75.19	75.43
2310	University and higher education teachers	1	0	26.39	73.61	85.41
2330	Secondary education teachers	41	19	26.39	73.61	82.41
2341	Primary school teachers	57	4	26.39	73.61	76.49
2351	Education methods specialists	2	0	26.39	73.61	77.88
2352	Special needs teachers	1	0	26.39	73.61	70.89
2353	Other language teachers	6	0	26.39	73.61	68.88
2354	Other music teachers	3	4	26.39	73.61	68.88
2355	Other arts teachers	2	0	26.39	73.61	68.88
2359	Teaching professionals not elsewhere classified	1	1	26.39	73.61	66.42
2411	Accountants	1	4	51.47	48.53	76.65
2423	Personnel and careers professionals	1	0	51.47	48.53	68.55
2431	Advertising and marketing professionals	4	1	51.47	48.53	73.91
2512	Software developers	3	29	84.72	15.28	74.66
2513	Web and multimedia developers	3	14	84.72	15.28	74.66
2519	Software and applications developers and analysts not elsewhere classified	0	3	84.72	15.28	74.7
2521	Database designers and administrators	0	2	84.72	15.28	75.13
2611	Lawyers	34	32	46.49	53.51	86.72
2612	Judges	4	4	46.49	53.51	88.96
2619	Legal professionals not elsewhere	0	2	46.49	53.51	81.05

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	classified					
2632	Sociologists, anthropologists and related professionals	3	4	46.49	53.51	83.09
2633	Philosophers, historians and political scientists	0	1	46.49	53.51	83.81
2634	Psychologists	15	3	46.49	53.51	85.85
2635	Social work and counselling professionals	2	2	46.49	53.51	70.5
2641	Authors and related writers	10	0	46.49	53.51	72.83
2642	Journalists	9	2	46.49	53.51	72.83
2643	Translators, interpreters and other linguists	10	0	46.49	53.51	80.92
2651	Visual artists	8	3	46.49	53.51	61.82
2652	Musicians, singers and composers	22	7	46.49	53.51	64.44
2653	Dancers and choreographers	7	0	46.49	53.51	61.82
2654	Film, stage and related directors and producers	1	1	46.49	53.51	63.31
2655	Actors	37	12	46.49	53.51	70.1
2656	Announcers on radio, television and other media	10	12	46.49	53.51	54
3112	Civil engineering technicians	0	3	91.64	8.36	59.35
3113	Electrical engineering technicians	0	9	91.64	8.36	51.92
3115	Mechanical engineering technicians	1	12	91.64	8.36	53.77
3116	Chemical engineering technicians	0	1	91.64	8.36	59.45
3118	Draughtspersons	0	4	91.64	8.36	50.73
3123	Construction supervisors	1	4	91.64	8.36	37.83
3153	Aircraft pilots and related associate professionals	2	27	91.64	8.36	73.71
3155	Air traffic safety electronics technicians	0	2	91.64	8.36	67.04
3212	Medical and pathology laboratory technicians	0	3	30.20	69.80	57.37
3213	Pharmaceutical technicians and assistants	1	0	30.20	69.80	48.66
3214	Medical and dental prosthetic technicians	1	2	30.20	69.80	54.92
3230	Traditional and complementary medicine associate professionals	0	1	30.20	69.80	51.57
3240	Veterinary technicians and assistants	2	0	30.20	69.80	24.79
3251	Dental assistants and therapists	2	0	30.20	69.80	47.83
3254	Dispensing opticians	0	4	30.20	69.80	59.85
3255	Physiotherapy technicians and assistants	6	0	30.20	69.80	53.15
3256	Medical assistants	1	0	30.20	69.80	44.92

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3258	Ambulance workers	0	1	30.20	69.80	53.15
3259	Health associate professionals not elsewhere classified	1	0	30.20	69.80	61.91
3320	Sales and purchasing agents and brokers	0	1	42.86	57.14	57.97
3321	Insurance representatives	0	2	42.86	57.14	60.29
3322	Commercial sales representatives	0	1	42.86	57.14	57.03
3332	Conference and event planners	5	0	42.86	57.14	56.64
3334	Real estate agents and property managers	5	6	42.86	57.14	62.39
3342	Legal secretaries	2	0	42.86	57.14	57.99
3355	Police inspectors and detectives	0	7	42.86	57.14	63.03
3421	Athletes and sports players	10	108	46.32	53.68	50.9
3422	Sports coaches, instructors and officials	15	2	46.32	53.68	50.9
3423	Fitness and recreation instructors and program leaders	3	1	46.32	53.68	50.9
3431	Photographers	17	2	46.32	53.68	50.15
3432	Interior designers and decorators	7	1	46.32	53.68	57.64
3434	Chefs	0	7	46.32	53.68	50.15
3511	Information and communications technology operations technicians	1	32	85.24	14.76	61.07
3521	Broadcasting and audiovisual technicians	0	3	85.24	14.76	56.57
4110	General office clerks	60	36	17.18	82.82	43.33
4120	Secretaries (general)	11	0	17.18	82.82	44.94
4211	Bank tellers and related clerks	33	31	26.30	73.70	48.1
4221	Travel consultants and clerks	2	0	26.30	73.70	49.3
4224	Hotel receptionists	7	2	26.30	73.70	39.02
4311	Accounting and bookkeeping clerks	5	1	41.57	58.43	50.37
4312	Statistical, finance and insurance clerks	1	0	41.57	58.43	57.38
4321	Stock clerks	1	1	41.57	58.43	32.5
4411	Library clerks	2	1	55.77	44.23	42.3
5111	Travel attendants and travel stewards	9	3	41.60	58.40	46.76
5113	Travel guides	2	0	41.60	58.40	47.42
5120	Cooks	26	50	41.60	58.40	24.53
5131	Waiters	25	17	41.60	58.40	25.04
5141	Hairdressers	54	2	41.60	58.40	31.08
5142	Beauticians and related workers	9	0	41.60	58.40	31.08
5152	Domestic housekeepers	3	0	41.60	58.40	32.2
5161	Astrologers, fortune-tellers and related workers	0	1	41.60	58.40	32.75
5164	Pet groomers and animal care	47	10	41.60	58.40	30.59

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	workers					
5165	Driving instructors	0	1	41.60	58.40	30.59
5223	Shop sales assistants	44	25	28.12	71.88	28.48
5230	Cashiers and ticket clerks	1	0	28.12	71.88	30.9
5241	Fashion and other models	6	0	28.12	71.88	39.73
5246	Food service counter attendants	1	1	28.12	71.88	39.04
5311	Child care workers	160	5	12.39	87.61	24.98
5321	Health care assistants	7	0	12.39	87.61	26.64
5411	Fire-fighters	1	12	78.36	21.64	46.38
5412	Police officers	16	53	78.36	21.64	51.5
5419	Protective services workers not elsewhere classified	0	3	78.36	21.64	33.83
6112	Tree and shrub crop growers	0	2	60.61	39.39	18.95
6113	Gardeners, horticultural and nursery growers	12	6	60.61	39.39	20.91
6129	Animal producers not elsewhere classified	1	0	60.61	39.39	28.04
6130	Farming-related jobs	14	37	60.61	39.39	17.79
6210	Forestry and related workers	0	8	60.61	39.39	19.78
6310	Subsistence crop farmers	0	1	60.61	39.39	11.01
6320	Subsistence livestock farmers	1	0	60.61	39.39	11.01
7112	Bricklayers and related workers	0	4	98.01	1.99	22.57
7113	Stonemasons, stone cutters, splitters and carvers	0	1	98.01	1.99	23.96
7114	Concrete placers, concrete finishers and related workers	0	1	98.01	1.99	21.96
7115	Carpenters and joiners	0	12	98.01	1.99	26.62
7119	Building frame and related trades workers not elsewhere classified	0	6	98.01	1.99	26.92
7121	Roofers	1	1	98.01	1.99	22.16
7122	Floor layers and tile setters	0	2	98.01	1.99	22.75
7125	Glaziers	0	1	98.01	1.99	24.09
7126	Plumbers and pipe fitters	1	16	98.01	1.99	29.16
7127	Air conditioning and refrigeration mechanics	0	2	98.01	1.99	25.26
7131	Painters and related trades workers	2	6	98.01	1.99	22.77
7132	Spray painters and varnishers	0	3	98.01	1.99	24.49
7133	Building structure cleaners	0	1	98.01	1.99	30.47
7221	Blacksmiths, hammersmiths and forging press workers	0	1	95.41	4.59	25.63
7223	Metal working machine tool setters and operators	0	2	95.41	4.59	28.7
7230	Machinery mechanics and repairers	1	10	95.41	4.59	31.15
7231	Motor vehicle mechanics and repairers	4	88	95.41	4.59	30.78

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7232	Aircraft engine mechanics and repairers	0	1	95.41	4.59	47.74
7233	Agricultural and industrial machinery mechanics and repairers	0	59	95.41	4.59	31.72
7234	Bicycle and related repairers	0	1	95.41	4.59	31.15
7312	Musical instrument makers and tuners	1	0	72.29	27.71	35.66
7313	Jewelers and precious-metal workers	2	0	72.29	27.71	28.12
7319	Handicraft workers not elsewhere classified	2	0	72.29	27.71	30.35
7322	Printers	0	1	72.29	27.71	30.49
7412	Electrical mechanics and fitters	0	1	97.22	2.78	36.92
7413	Electrical line installers and repairers	1	33	97.22	2.78	39.45
7421	Electronics mechanics and servicers	0	10	97.22	2.78	43.76
7511	Butchers, fishmongers and related food preparers	0	2	66.68	33.32	20.95
7512	Bakers, pastry-cooks and confectionery makers	14	11	66.68	33.32	23.57
7521	Wood treaters	0	3	66.68	33.32	21.81
7522	Cabinet-makers and related workers	5	40	66.68	33.32	25.23
7543	Product graders and testers (excluding food and beverages)	0	2	66.68	33.32	43.19
8171	Pulp and papermaking plant operators	0	1	71.40	28.60	27.25
8311	Locomotive engine drivers and related workers	0	4	94.98	5.02	45.76
8321	Motorcycle drivers	0	1	94.98	5.02	28.48
8322	Car, taxi and van drivers	0	2	94.98	5.02	30.34
8332	Heavy truck and lorry drivers	0	5	94.98	5.02	25.95
8341	Mobile farm and forestry plant operators	0	1	94.98	5.02	13.34
8342	Earthmoving and related plant operators	0	5	94.98	5.02	24.45
9111	Domestic cleaners and helpers	2	0	11.45	88.55	16.38
9611	Garbage and recycling collectors	0	1	78.65	21.35	14.39
9613	Sweepers and related laborers	0	1	78.65	21.35	13.87
9621	Messengers, package deliverers and luggage porters	0	1	78.65	21.35	25.06
100	Public service employees (Government officials)	3	9	44.89	55.11	-

3rd Publication: Korlat, S., Holzer, J., Schultes, M.-T., Bürger, S., Schober, B., Spiel, C., & Kollmayer, M. (under review). Psychological Androgyny in School: Associations Between Adolescents' Gender Role Self-Concept and School-Related Well-Being. *School Mental Health*.

Contributions by the individual authors

Selma Korlat conducted and interpreted data analyses and drafted the manuscript.

Julia Holzer collected and prepared data and contributed to the final version of the manuscript.

Marie-Therese Schultes contributed to the final version of the manuscript.

Sarah Bürger participated in the study design and data collection.

Barbara Schober and **Christiane Spiel** conceived the study design and contributed to the final version of the manuscript.

Marlene Kollmayer supervised the manuscript preparation and contributed to the final version of the manuscript.

All authors read and approved the final manuscript.

Psychological Androgyny in School: Associations Between Adolescents' Gender Role Self-Concept and School-Related Well-Being

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Psychological Androgyny in School: Associations Between Adolescents' Gender Role Self-Concept and School-Related Well-Being

It has been repeatedly shown that the extent to which individuals adopt stereotypically masculine and feminine traits in their self-concept impacts their psychological adjustment and health. This is especially important in adolescence, when developmental changes and social pressures to conform to stereotypical gender roles can affect psychological functioning and well-being. However, previous studies with adolescents focused on general well-being rather than specific domains. Given that school is one of the most important domains for adolescents' lifelong development and well-being, the aim of this study was to investigate the associations between gender role self-concept and school-related well-being. A total of 999 Austrian adolescents (52.2% girls, $M_{\text{age}} = 13.79$, $SD_{\text{age}} = 1.53$) answered inventories assessing adolescents' gender role self-concept (GRI-JUG) and school-related well-being (EPOCH) in terms of overall school-related well-being as well as its five dimensions: Engagement, Perseverance, Optimism, Connectedness, and Happiness. The results supported the androgyny model of well-being, but indicated the stronger importance of femininity in adolescence and the school context than later in life. Implications are discussed.

Keywords: *gender role self-concept, well-being, school, androgyny, adolescents*

Introduction

Adolescence is seen as a key stage of development characterized by profound changes in the biological, cognitive, psychosocial, and emotional domains (Choudhury et al. 2006). In this period, individuals should develop the capabilities required to lead a happy, healthy, and productive life (Laski et al. 2015).

According to gender intensification theory, it is during this same time that girls and boys develop increasingly differentiated gender role identities due to increased pressure to conform to stereotypical gender roles (Hill and Lynch 1983). These two developmental processes are interrelated, as it has been repeatedly shown that differences in the extent to which individuals adopt stereotypically masculine and feminine traits in their self-concept impact their psychological adjustment and well-being (Abele 2014; Fournier and Moskowitz 2000; Helgeson 1994; Markstrom-Adams, 1989; Saragovi et al. 2002; Saragovi et al. 1997; Sheldon and Cooper 2008). Likewise, high levels of well-being in adolescence enable young people to deal with developmental tasks and promote a healthy transition to adulthood (Pyhälä et al. 2010). It has been shown that adolescents' well-being is related to their academic functioning (Ainly and Ainly 2011; Elmore and Huebner 2010; Lewis et al. 2011), academic achievement (Berger et al. 2011), and is a protective factor for health in general (Carver et al. 2010). Studies have shown that adolescents with high levels of well-being are more resilient (Antaramian et al. 2010; Gilman and Huebner 2006), have fewer depressive and anxiety symptoms, higher self-esteem, higher self-efficacy and higher adaptation (Antaramian et al. 2010; McKnight et al. 2002; Suldo and Huebner 2004). These adolescents show enhanced mental and physical health outcomes and higher general life satisfaction (Haranin et al. 2007; Suldo et al. 2006; Tian et al. 2014).

Well-being in adolescence is integrally shaped by the everyday contexts in which adolescents grow and develop (Žukauskienė 2014). As the place where adolescents spend almost one-third of their lives, school is one of the most important contexts within which adolescents' development, including their well-being and gender socialization, unfolds (Bolzendahl and Myers 2004; Eccles 2004). It has been shown that adolescents' experiences and relationships at school have an important impact on their perceived quality of life (Jourdan et al. 2008)

and likely have important implications for their lifelong development (Eccles and Roeser 2011; Park 2004). Given the importance of both school and well-being for adolescents' development and mental health, it is important to understand the relationship between gender role self-concept and well-being in the school context, which was the aim of this study.

Gender Role Self-concept and Well-being

Gender role self-concept refers to the degree to which persons adopt stereotypically feminine and masculine attributes in their self-descriptions (Wolfram et al. 2009). Socialization pressure may lead adolescents to internalize societal gender role expectations as part of their self-concept (Bem 1981; Cejka and Eagly 1999; Hill and Lynch 1983; Klaczynski et al. 2020). In most studies investigating gender role self-concept, self-perception of expressive traits (e.g. kind, gentle, sensitive to others) is used to assess femininity, and self-perception of instrumental traits (e.g. independent, competitive, strong) is used to assess masculinity (Bem 1974, 1981; Spence 1985, 1991). Four types of gender role self-concepts can be formulated based on continuous scores on the femininity and masculinity dimensions. Masculine individuals perceive themselves as high on masculine and low on feminine traits, feminine individuals score high on feminine and low on masculine traits, androgynous persons rate themselves as high on both sets of traits, and undifferentiated individuals view themselves as low on both sets of traits. The interrelations between gender role self-concept and well-being have been widely studied, as it has been noted that individual differences in these two dimensions affect overall functioning and health (e.g. Abele 2014; Fournier and Moskowitz 2000; Helgeson 1994; Markstrom-Adams 1989; Saragovi et al. 2002; Saragovi et al. 1997; Sheldon and Cooper 2008; Whitley 1984; Wolfram et al. 2009). There are three different models explaining the relationship between gender role self-concept and well-being, namely the congruence model, the androgyny model and the masculinity model.

Traditionally, individuals' psychological well-being was thought to be related to their successful adoption of gender-typical behaviors and traits (the congruence model, Markstrom-Adams 1989; Whitley 1983). This hypothesis has received some support with preadolescent samples. For instance, Craver et al. (2003) found

that early adolescents who perceived themselves to be atypical members of their same-sex peer group reported distress over their peer relations. In another study, the same authors confirmed that feeling gender-typical was positively related to adolescents' well-being, whereas feeling pressure to conform to gender stereotypes was found to have a negative influence (Yunger et al. 2004). These authors did not measure gender role self-concept as the self-ascription of gender-typical traits, but focused on a measure of gender identity based on adolescents' feelings of same-gender typicality, which is composed of five different components: membership knowledge, gender typicality, gender contentedness, felt pressure for gender conformity and intergroup bias (Egan and Perry 2001). Other studies using Egan and Perry's (2001) measure have also found that the more adolescents feel same-gender typical, the greater their self-esteem and the fewer internalizing problems they have (Cooper et al. 2013; Corby et al. 2007; Egan and Perry 2001; Pauletti et al. 2014; Smith and Leaper 2006).

The androgyny model (Bem 1974, 1979; Spence and Helmreich 1978) posits that psychological well-being is maximized when one has an androgynous gender role self-concept, which encompasses a broad set of attributes and behavioral options that allow for flexible behavior and successful coping with different demands and life situations (Alfermann 1996; Bem 1974; Bierhoff-Alfermann 1989; Gilbert 1981; Helgeson 1994; Saragovi et al. 1997; Vonk and Ashmore 1993). This model has received support in adult samples: androgynous individuals have the lowest levels of depression (Roos and Cohen 1987), decreased stress and anxiety (Lam and McBride-Chang 2007; Prakash et al. 2010), and the highest levels of self-esteem (Gilbert 1981). Some older studies found similar results with adolescents: androgynous adolescents of both sexes are better adjusted, have higher self-esteem (Bem 1981; Block 1973; Boldizar 1991; Hall and Halberstadt 1980; Lamke 1982a; Wells 1980), and are significantly less lonely (Avery 1982). A more recent study using a new measure of gender identity (Egan and Perry 2001) in a group of children and adolescents (ages 9-14) in the US also found that androgynous individuals exhibited higher self-esteem and, among older children, fewer internalizing problems and less felt pressure for gender conformity (Pauletti et al. 2017).

However, the proposed relationship between androgyny and psychological well-being has been called into question by empirical findings claiming that it is the masculine component of androgyny that is most associated with both adolescents' and adults' well-being (the masculinity model, Whitley 1985). Indeed, the vast majority of studies have found masculinity to be associated with subjective well-being and other self-report measures of psychological adjustment (Abele et al. 2016; Antill and Cunningham 1979; Locksley and Colten 1979; Helgeson 1994; Kasser and Ryan 1996; Silvern and Ryan 1979; Saragovi et al. 2002; Whitley 1984). For example, older meta-analyses found strong correlations between masculinity and high self-esteem (Whitley 1983), and moderately strong relationships between masculinity and lack of depression as well as between masculinity and diverse indicators of psychological adjustment, such as low anxiety and high general well-being (Whitley 1985). Similarly, research by Helgeson (1994) showed that masculinity is associated with reduced depression, anxiety, and health complaints, whereas femininity showed less clear associations with these well-being parameters. Studies with adolescents have come to more heterogeneous results. In a study with adolescents aged 11, 13 and 15 in the United States, masculinity was linked to lower rates of depressive symptoms, while femininity was not (Priess et al. 2009). Another cross-sectional study with 12,287 Norwegian adolescents aged 12 to 20 found femininity to be modestly positively correlated with depressed mood, whereas no such correlation was obtained for masculinity (Wichstrøm 1999). On the other hand, Helgeson and Palladino (2012) found that both masculinity and femininity were associated with positive relationship and health outcomes among US adolescents, with femininity being a stronger predictor than masculinity. A recent longitudinal study with Chinese children and adolescents aged 6 to 11 using self-descriptive questionnaires containing instrumental and expressivity traits (Han et al. 2015) found that older children's self-esteem was more related to instrumental than expressive traits, whereas younger children's self-esteem was more related to expressivity than instrumentality (Chen et al. 2018). These authors argued that expressive traits and behaviors are relatively more important to younger children's self-esteem due to the prominence of social goals at this age; conversely, instrumental traits and behaviors are relatively more important to older children's

self-esteem due to the increasing importance of performance-related goals. In sum, empirical evidence supports both the masculinity and androgyny models of well-being, but indicates the stronger importance of femininity in adolescence compared to adulthood.

School-related Well-being

Well-being has been operationalized in heterogeneous ways in existing studies, ranging from self-esteem measures (e.g. Craver et al. 2003; Lamke 1982; Wells 1980), positive and negative affect and life satisfaction scales (e.g. Buchanan and Bardi 2014), absence of depression (e.g. Helgeson 1994; Priess et al. 2009) and psychological distress (Helgeson and Palladino 2012), to various measures of adjustment such as low internalizing problems (e.g. Massad 1981; Pauletti et al. 2017; Wells 1980; Whitley 1984; Younger et al. 2004). On the whole, most previous measures focus on hedonic well-being, which defines well-being in terms of attaining pleasure and avoiding pain (Kahneman et al. 1999), and refer to well-being as an outcome. However, in recent years, with the emergence and growth of positive psychology, well-being has been reconceptualized in a way that focuses less on the mere absence of psychopathological features and more on the presence of resources and self-actualization (Huppert 2014). This led to the conceptualization of well-being as consisting of both hedonic and eudemonic aspects in terms of the full functioning of the person, referring to well-being as a process (Ryan and Deci 2001). Against this backdrop, Seligman (2011) proposed a five-element model consisting of Positive Emotions, Engagement, Relationships, Meaning, and Accomplishment (PERMA). Applying the PERMA model to adolescents (Kern et al. 2015) led to the development of the EPOCH model of adolescent well-being (Kern et al. 2016), which likewise encompasses five domains: Engagement, Perseverance, Optimism, Connectedness, and Happiness. Whilst optimism and happiness correspond to the hedonic aspect of well-being, other EPOCH dimensions capture eudemonic characteristics. Engagement refers to the capacity to become absorbed in and focused on activities and tasks. Perseverance reflects the ability to keep striving toward one's goals despite encountering obstacles. Optimism is characterized by hopefulness and confidence about the future. Connectedness describes satisfying relationships and

friendships, giving and receiving support to and from others. Happiness refers to having a generally positive mood and feeling content with one's life (Kern et al. 2016). Thus, EPOCH covers a wide range of components associated with optimal functioning in adolescence, taking into account both hedonic as well as eudemonic aspects of well-being. Hence, it unites domains that have been studied individually or combined under the umbrella term "well-being" in different constellations.

Another change resulting from positive psychology is the emphasis on youth's optimal well-being in specific domains (Bradshaw et al. 2011; Elmore and Huebner 2010; Long et al. 2012; Seligman and Csikszentmihalyi 2000). School is a key life domain for school-aged children and adolescents and a place where they spend a great deal of time. As such, school plays an important role in every aspect of youth development – it shapes their identity, intellectual and cognitive growth, social relationships and psychological well-being (Long and Huebner 2014; Park 2004; Verhoeven et al. 2019; Wigfield et al. 2006). Moreover, school is a place where adolescents prepare for their future (Eccles and Roeser 2011).

Understanding adolescents' functioning and well-being in school is of utmost importance. However, although researchers have called for specialized measures of well-being in the school context (Huebner et al. 2005; PISA 2018), knowledge of adolescents' well-being in school is still limited (Konu and Lintonen 2005). Most existing scales for school-related well-being are designed to assess global well-being in school (e.g. quality of school life) and do not reflect the full variety of adolescents' functioning in the school context (e.g. Epstein and McPartland 1976; Huebner 1994; Karatzias et al. 2001; see Gilman and Huebner 2000 for an overview of existing measures). In line with the new conceptualization of well-being uniting hedonic and eudemonic approaches, in the present study a new measure of school-related well-being encompassing the five domains suggested in

the EPOCH model as well as a superordinate factor (Buerger et al. 2020) has been used.

Objectives of the Present Study

This study focuses on the relations between adolescents' gender role self-concept and school-related well-being in terms of the EPOCH model. We investigate differences between adolescents with different gender role self-concepts (masculine, feminine, androgynous and undifferentiated) in terms of overall school-related well-being (EPOCH) as well as in the individual EPOCH dimensions: Engagement, Perseverance, Optimism, Connectedness, and Happiness.

Taking into account both social and performance-related challenges and requirements in school and the fact that androgynous individuals have the broadest repertoire of traits and behaviors (e.g. Bem 1981; Block 1973; Boldizar 1991; Pauletti et al. 2017), we expect androgynous boys and girls to show the highest levels of overall school-related well-being compared to the other three types of gender role self-concepts. Similarly, we expect androgynous boys and girls to have the highest levels of the two hedonic dimensions – optimism and happiness. We have differential hypotheses for the eudemonic dimensions. Engagement and perseverance are instrumental qualities, as they reflect orientations toward achievement-related goals, while connectedness reflects the core value of expressivity – orientation towards others and social-related goals (Abele et al. 2016; Bakan 1966). Therefore, we expect masculine and androgynous boys and girls to exhibit the highest levels of engagement and perseverance and feminine and androgynous boys and girls to exhibit the highest levels of connectedness. Undifferentiated adolescents are expected to have the lowest levels of both overall school-related well-being as well as all individual dimensions compared to the other three types. We expected our hypotheses to be confirmed for both boys and girls of all ages in our study. As Bem (1993) did not suggest variations in the benefits of androgyny across different ages or sexes, we treated participants' sex and age as control variables.

Methods

Participants and Procedure

The study sample consisted of 999 secondary school students (52.2% girls, 47.8% boys, $M_{\text{age}} = 13.79$, $SD_{\text{age}} = 1.53$; age range 12-17) from Vienna, Austria. Data collection took place in January 2020. To recruit participants, 10 secondary schools in Vienna were contacted by e-mail. Seven of these schools agreed to participate and were included in the sample. Students filled out paper-pencil questionnaires in their classrooms, supervised by trained research assistants. Participation in the study was voluntary and parental consent was obtained for participation in the study as well as data usage. The study was approved and supported by the local school board in accordance with Austrian federal law.

Measures

Gender role self-concept: To assess self-perceived femininity and masculinity, positive traits from the Inventory for Measuring Adolescents' Gender Role Self-concept (GRI-JUG) were used (Krahe et al. 2007). Participants were presented with five masculine attributes (humorous, courageous, sporty, companionable, and strong; $\alpha = .68$) and five feminine attributes (emotional, romantic, industrious, sympathetic and empathic; $\alpha = .66$), and were asked to rate to what extent each attribute is characteristic of them on a 5-point Likert scale ranging from 1 (not at all true) to 5 (completely true). Scores were calculated for masculinity and femininity separately. The median-split procedure adopted by Spence et al. (1975) and Bem (1977) was used to determine the four types of gender role self-concept. Participants were classified into a 2 x 2 table according to whether they fell above or below the median score on the masculinity and femininity scales. Scores falling exactly on the median were classified as "high" scores (Carver et al. 2013). In the present sample, the median masculinity score was 3.8 and the median femininity score was 3.6.

Well-being: School-related well-being was assessed with the EPOCH-G-S Measure of School-related Adolescent Well-Being (Buerger et al. 2020), a 19-item measure developed for students aged 10 to 18. The measures' scales address

the five EPOCH dimensions of Engagement (four items, e.g., “When I do an activity for school, I enjoy it so much that I lose track of time”), Perseverance (four items, e.g., “When I have started a school task, I finish it”), Optimism (three items, e.g., “I am optimistic about my future at school”), Connectedness (four items, e.g., “When something good happens to me, I have people at school who I like to share the good news with”), and Happiness (four items, e.g., “I feel happy at school”). The measure uses a 5-point response format (1 = not true at all; 5 = completely true). The internal reliability of the EPOCH-G-S was $\alpha = .86$. Reliabilities for the EPOCH-G-S subscales were $\alpha = .72$ for Engagement, $\alpha = .79$ for Perseverance, $\alpha = .67$ for Optimism, $\alpha = .73$ for Connectedness, and $\alpha = .85$ for Happiness.

Results

Overall school-related well-being

In order to examine differences in overall school-related well-being in adolescents, a 4x2 ANCOVA was conducted with gender role self-concept and sex as between-subject factors and age as a covariate. The mean score of all EPOCH items was the dependent variable. Means and standard deviations for overall school-related well-being by gender role self-concept and sex are presented in Table 1.

The results showed a significant effect of age, $F(1, 996) = 27.72, p < .001, \eta^2 p = .027$, indicating a negative relationship between age and school-related well-being, $r(998) = -.147, p < .001$. There was also a significant main effect of gender role self-concept after controlling for adolescents' age, $F(3, 996) = 60.98, p < .001, \eta^2 p = .156$. A Bonferroni post-hoc test showed that androgynous adolescents ($M = 3.73, SD = .54$) reported significantly higher overall school-related well-being than masculine ($M = 3.39, SD = .53$), feminine ($M = 3.42, SD = .49$) and undifferentiated ($M = 3.16, SD = .57$) adolescents, all $ps < .001$. Undifferentiated adolescents, on the other hand, had significantly lower overall school-related well-being than adolescents with other gender role self-concepts, all $ps < .01$. There were no differences between masculine and feminine adolescents in overall school-related well-being, $p > .05$. The main effect of sex was also significant,

$F(1, 996) = 16.21, p < .001, \eta^2p = .016$, with girls ($M = 3.50, SD = .53$) reporting higher overall school-related well-being compared to boys ($M = 3.35, SD = .54$). The interaction between gender role self-concept and sex was not significant, $F(3, 996) = 1.58, p = .192$.

Dimensions (EPOCH) of School-related Well-being

To explore differences between boys and girls with different gender role self-concepts in specific EPOCH dimensions, a two-way multivariate analysis of covariance (MANCOVA) with gender role self-concept and sex as between-subject factors and age as a covariate was conducted. The mean scores of the five EPOCH dimensions Engagement, Perseverance, Optimism, Connectedness and Happiness served as dependent variables in the model. Correlation coefficients between EPOCH dimensions are reported in Table 2. The MANCOVA yielded significant multivariate effects for gender role self-concept, $F(3, 996) = 12.86, p < .001, \eta^2p = .061$, and sex, $F(1, 996) = 11.76, p < .001, \eta^2p = .056$, as well as the covariate age, $F(1, 996) = 14.30, p < .001, \eta^2p = .068$. The interaction effect between factors was not significant, $F(3, 996) < 1, p = .476$. We followed up on the significant multivariate effects with univariate analyses of covariance (ANCOVAs). Table 3 presents the means and standard deviations for all five EPOCH dimensions by gender role self-concept and sex.

Engagement

The results showed a significant effect of age, $F(1, 996) = 16.88, p < .001, \eta^2p = .017$. There was a negative relationship between age and engagement, $r(998) = -.127, p < .001$. There was also a main effect of gender role self-concept after controlling for age, $F(3, 996) = 17.46, p < .001, \eta^2p = .050$. A Bonferroni post-hoc test revealed that androgynous adolescents ($M = 3.07, SD = .82$) reported significantly higher scores on engagement than masculine ($M = 2.69, SD = .82$), feminine ($M = 2.74, SD = .76$), and undifferentiated ($M = 2.65, SD = .85$) adolescents. Differences among the other types were not significant, all $ps > .05$. The main effect of sex was also significant after controlling for age, $F(1, 996) = 5.58, p < .05, \eta^2p = .006$, with girls ($M = 2.86, SD = .80$) reporting higher engagement than boys ($M = 2.72, SD = .88$).

Perseverance

The results showed a significant effect of age, $F(1, 996) = 38.28, p < .001, \eta^2p = .037$. The relationship between age and perseverance was negative, $r(998) = -.181, p < .001$. The results showed also a significant main effect of gender role self-concept after controlling for age, $F(3, 996) = 29.23, p < .001, \eta^2p = .082$. A Bonferroni post-hoc test revealed that androgynous adolescents ($M = 3.87, SD = .76$) reported significantly higher scores on perseverance than masculine ($M = 3.46, SD = .85$), feminine ($M = 3.64, SD = .76$), and undifferentiated ($M = 3.31, SD = .81$) adolescents, $p < .05$. Undifferentiated adolescents reported lower scores than androgynous and feminine adolescents, $p < .05$. Mean differences between the other groups were not significant, $p > .05$. The main effect of sex was also significant after controlling for age, $F(1, 996) = 10.40, p < .01, \eta^2p = .010$, with girls ($M = 3.66, SD = .80$) reporting higher perseverance than boys ($M = 3.48, SD = .84$).

Optimism

The effect of age was not significant for optimism, $F(1, 996) = 1.78, p = .182$. The results showed a significant main effect of gender role self-concept, $F(3, 996) = 29.47, p < .001, \eta^2p = .082$. A Bonferroni post-hoc test showed that androgynous adolescents ($M = 3.65, SD = .81$) reported significantly higher scores on optimism than masculine ($M = 3.33, SD = .85$), feminine ($M = 3.35, SD = .79$), and undifferentiated ($M = 3.02, SD = .85$) adolescents, $p < .05$. Undifferentiated adolescents reported lower scores than all other groups, while there was no significant difference between masculine and feminine adolescents. The main effect of sex was not significant, $F(1, 996) = 1.32, p = .251$.

Connectedness

The results showed no significant effect of age for connectedness, $F(1, 996) < 1, p = .631$. The main effect of gender role self-concept was significant, $F(3, 996) = 32.73, p < .001, \eta^2p = .090$. A Bonferroni post-hoc test revealed that androgynous adolescents ($M = 4.24, SD = .70$) reported significantly higher scores on connectedness than masculine ($M = 4.02, SD = .71$), feminine ($M = 3.96, SD = .83$), and undifferentiated ($M = 3.64, SD = .85$) adolescents, $p < .05$.

Undifferentiated adolescents reported lower scores than all other groups, while there was no significant difference between masculine and feminine adolescents on connectedness. The main effect of sex was also significant, $F(1, 996) = 30.60$, $p < .001$, $\eta^2 p = .030$. Girls ($M = 4.11$, $SD = .78$) scored significantly higher on connectedness than boys ($M = 3.82$, $SD = .80$).

Happiness

The effect of the covariate age was significant for happiness, $F(1, 996) = 31.54$, $p < .001$, $\eta^2 p = .031$. There was a negative relationship between age and happiness, $r(998) = -.167$, $p < .001$. The main effect of gender role self-concept was also significant after controlling for age, $F(3, 996) = 31.74$, $p < .001$, $\eta^2 p = .088$. A Bonferroni post-hoc test revealed that androgynous adolescents ($M = 3.81$, $SD = .86$) scored significantly higher on happiness than masculine ($M = 3.45$, $SD = .88$), feminine ($M = 3.39$, $SD = .87$), and undifferentiated ($M = 3.15$, $SD = .87$) adolescents, $p < .05$. Undifferentiated adolescents reported lower scores than all other groups, while there was no significant difference between masculine and feminine adolescents. The main effect of sex was significant after controlling for age, $F(1, 996) = 7.37$, $p < .01$, $\eta^2 p = .007$, with girls ($M = 3.53$, $SD = .88$) scoring higher on the happiness scale than boys ($M = 3.37$, $SD = .93$).

Discussion

The goal of this study was to investigate relations between adolescent boys' and girls' gender role self-concepts and school-related well-being, taking into account both hedonic and eudemonic aspects of well-being. In general, our results support the androgyny model of well-being: androgynous boys and girls exhibited the highest levels of overall school-related well-being as well as the highest scores in all individual EPOCH dimensions: Engagement, Perseverance, Optimism, Connectedness, and Happiness. This finding is in line with Bem's theorizing that individuals who score high in both masculinity and femininity display better adjustment and greater psychological health (Bem 1981, 1993), as well as other studies confirming this notion in adolescent samples (Block 1973; Boldizar 1991; Hall and Halberstadt 1980; Lamke 1982a; Pauletti et al. 2017; Wells, 1980). School is the first social space after the home in which individuals experience

obligations, engagement, commitment and relationships. Thus, having a broader set of attributes and behavioral options that allow for flexible behavior and successful coping with different demands is more important in school than anywhere else during childhood and adolescence. This might be even more important in secondary school when classes become more challenging, peer relationships grow more complex, and educational and professional goals are developed and shaped (Brown and Larson 2009; Verhoeven et al. 2019). Our results also confirmed our assumption that undifferentiated adolescents exhibit the lowest scores in overall school-related well-being as well as all individual dimensions. Similar to androgynous persons, undifferentiated individuals are not gender-typed (Bem 1977), but unlike androgynous individuals, they lack the enriched behavioral repertoire of androgynous persons and at the same time do not possess the positive characteristics typical of either a masculine or feminine self-concept. For that reason, the lowest levels of well-being were found in this group in previous studies focusing on general well-being (see Markstrom-Adams 1989 for review) and were expected in the context of school-related well-being as well.

However, contrary to our expectations, androgynous girls and boys scored higher on all individual EPOCH dimensions compared to masculine and feminine girls and boys. This finding is not surprising for the two hedonic dimensions of school-related well-being – optimism and happiness – which refer to positive affect in the school context and, as such, are not related to either masculinity or femininity. However, the eudemonic dimensions – engagement, perseverance and connectedness – have more gendered connotations and encompass instrumental and expressive goals and behaviors. With engagement and perseverance being clearly achievement-oriented, and connectedness reflecting social-related goals, we expected masculine adolescents to achieve the same results as androgynous adolescents in engagement and perseverance, and feminine adolescents to be similar to androgynous adolescents on connectedness. The non-significant differences between adolescents with masculine and feminine gender role self-concepts in hedonic, but especially eudemonic dimensions, as well as in overall school-related well-being, speak in favor of the equal importance of masculinity and femininity for school-related well-being. Despite the clear dominance of the

masculinity model over the femininity model of well-being in the literature (Helgeson 1994; Priess et al. 2009; Wichstrøm 1999; Withley 1985), femininity seems to be as relevant as masculinity for adolescents' functioning in school. This is not surprising given the vital role of peer relationships in adolescence (Greenberg et al. 1983; Ryan 2001), as social interactions with classmates have been found to contribute to adolescents' well-being (Sandstrom and Dunn 2014). Moreover, feminine students are more liked by teachers and obtain better grades (Heyder and Kessels 2013), have stronger school-related self-esteem and exhibit stronger feelings of belonging at school (Skinner et al. 2019). Thus, our results confirm previous studies indicating the stronger importance of femininity in this period and in the school context compared to later in life (Chen et al. 2018; Heyder and Kessels 2013).

The salience of femininity for school-related well-being can be explained with William James's theorizing that "self-centrality breeds self-enhancement", according to which people's judgement of their own self-worth is determined by the self-centrality of expressive or instrumental traits (Gebauer et al. 2013). Given the social nature of school, it can be argued that femininity occupies a more central position for adolescents' school-related well-being than for general well-being or well-being in adulthood. On the other hand, schooling continually emphasizes performance- and achievement-related goals in the form of competence-related feedback, performance-based evaluations and expectations of adolescents to be successful and ambitious about their futures, making instrumentality integral to school-related well-being as well. Chen et al. (2018) argued that expressivity is relatively more central to younger children's self-esteem due to their social goals, whereas instrumentality is relatively more central to older children's self-esteem due to the importance of performance-related goals in that period of life. The effects of age on school-related well-being in our study did not confirm this. The results showed a negative relationship between age and the instrumental dimension of EPOCH, with younger adolescents scoring higher on engagement and perseverance, whereas age did not have an effect on connectedness, indicating equal endorsement of items related to connectedness among adolescents of all ages. Although femininity might be more central for self-esteem at a younger age, connectedness in school seems equally important

across adolescence from the age of 12 to age 17. On the other hand, engagement and perseverance as defined in EPOCH seem to be more endorsed by younger adolescents. This is not surprising given that adolescents' behavioral and emotional involvement in academic activities declines as they grow older (Archambault et al. 2009; Fredricks et al. 2004). Our results also show a negative relationship between age and overall school-related well-being and happiness. Younger adolescents exhibit higher overall well-being and happiness. This finding is consistent with previous studies showing a decrease in overall well-being and positive affect from early to middle adolescence (Goldbeck et al. 2007; González-Carrasco et al. 2017; Viejo et al. 2018).

Although one might expect stereotypical gender differences in the eudemonic EPOCH dimensions, our results showed that girls score higher in engagement, perseverance, connectedness, happiness, and overall school-related well-being than boys. There were no significant differences between boys and girls in optimism. In studies with adults, sex differences were found in gendered dimensions of well-being, with men scoring higher than women in self-acceptance and autonomy and women scoring higher than men in positive relations with others (Ahrens and Ryff 2006; Karasawa et al. 2011; Matud et al. 2019). A study applying the original EPOCH model of adolescents' general well-being found small sex differences for optimism and connectedness only (Kern et al. 2016), with girls scoring higher on connectedness and boys on optimism. However, items assessing the school-related EPOCH model are specific to the academic context, where girls exhibit higher engagement and tend to outperform boys (Duckworth and Seligman 2006; Hartley and Sutton 2013), which could explain girls' higher endorsement of school-related EPOCH items. More importantly, gender role self-concept has been shown to be a more important determinant of well-being and psychological adjustment than biological sex (e.g., Bem 1993; Chen et al. 2018; Priess et al. 2009; Whitley 1983). Sex differences in this context are therefore secondary to the effects of gender role self-concept. Moreover, the interaction between sex and gender role self-concept was not significant for overall school-related well-being or for any individual dimensions, supporting Bem's argument that androgyny does not offer more benefits to one gender than the other (Bem 1993). In sum, our findings revealed that, beyond the effects of age and sex,

androgynous adolescents experienced the highest levels of school-related well-being.

The results of this study have practical implications for school functioning. Developing curricular activities and a classroom environment that enhance both expressive and instrumental traits and behaviors in boys and girls may increase their school-related well-being. Interventions might focus on building performance- and achievement-related traits and goals as well as social-related traits and goals among all students, especially those at risk in terms of their well-being in school. These programs can not only contribute to school-related well-being among adolescents, but also decrease gender typing, which can result in reduced gender stereotypes in newer generations of adolescents (Kollmayer et al. 2020).

Limitations and Future Directions

Although the current study provides valuable insights into the relationship between gender role self-concept and school-related well-being, several limitations must be considered. First, this study focuses only on gender role self-concept, i.e. the self-perceived possession of specific gender-stereotyped attributes, and does not take into account other facets of gender role identity. Future studies might investigate the relationship between androgyny and school-related well-being by assessing gender identity as overall felt gender typicality (see Egan and Perry 2001). Second, the inventory used to assess gender role self-concept in this study comprised only positive masculine and feminine attributes. Although it has been noted that *positive* androgyny, i.e. a balance of positive masculine and positive feminine qualities, results in higher psychological well-being (Woodhill and Samuels 2003), investigating the relationship between negative gender-stereotyped attributes and school-related well-being might provide new insights. Third, this study does not address other factors impacting both gender socialization and school-related well-being. Further studies are needed to investigate the role of peers and teachers for the relation between gender role self-concept and school-related well-being. Finally, this study was conducted in a Western country and the results should not be generalized to other cultures. Androgyny seems to be beneficial for school-related well-being in

individualist societies where traditional gender roles might be more liberal. In societies with more rigid gender norms or different cultural contexts, a different interplay between gender role self-concept and school-related well-being might be observed.

Declarations

No funds, grants, or other support was received. The authors have no financial or proprietary interests in any material discussed in this article. All data and materials as well as software application support published claims and comply with field standards. All authors contributed to the study conception and implementation.

References

- Abele, A. E. (2014). Pursuit of communal values in an agentic manner: a way to happiness? *Frontiers in Psychology*, 5. <https://doi.org/10.3389/fpsyg.2014.01320>
- Abele, A. E., Hauke, N., Peters, K., Louvet, E., Szymkow, A., & Duan, Y. (2016). Facets of the Fundamental Content Dimensions: Agency with Competence and Assertiveness—Communion with Warmth and Morality. *Frontiers in Psychology*, 7. <https://doi.org/10.3389/fpsyg.2016.01810>
- Ahrens, C. J. C., & Ryff, C. D. (2006). Multiple Roles and Well-being: Sociodemographic and Psychological Moderators. *Sex Roles*, 55(11–12), 801–815. <https://doi.org/10.1007/s11199-006-9134-8>
- Alfermann, D. (1996). Geschlechterrollen und geschlechtstypisches Verhalten [Gender roles and gender-typical behaviour]. Stuttgart, Germany, Kohlhammer.
- Ainley, M., & Ainley, J. (2011). Student engagement with science in early adolescence: The contribution of enjoyment to students' continuing interest in learning about science. *Contemporary Educational Psychology*, 36(1), 4–12. <https://doi.org/10.1016/j.cedpsych.2010.08.001>
- Antaramian, S. P., Huebner, E. S., Hills, K. J., & Valois, R. F. (2010). A dual-factor model of mental health: Toward a more comprehensive understanding of youth functioning. *American Journal of Orthopsychiatry*, 80(4), 462–472. <https://doi.org/10.1111/j.1939-0025.2010.01049.x>
- Antill, J. K., & Cunningham, J. D. (1979). Self-esteem as a function of masculinity in both sexes. *Journal of Consulting and Clinical Psychology*, 47(4), 783–785. <https://doi.org/10.1037/0022-006X.47.4.783>
- Archambault, I., Janosz, M., Morizot, J., & Pagani, L. (2009). Adolescent behavioral, affective, and cognitive engagement in school: Relationship to dropout. *Journal of School Health*, 79(9), 408–415. <https://doi.org/10.1111/j.1746-1561.2009.00428.x>
- Avery, A. W. (1982). Escaping loneliness in adolescence: The case for androgyny. *Journal of Youth and Adolescence*, 11(6), 451–459. <https://doi.org/10.1007/BF01538806>
- Bakan, D. (1966). The duality of human existence: An essay on psychology and religion. Rand McNally.

- Bem, S. L. (1974). The measurement of psychological androgyny. *Journal of Consulting and Clinical Psychology*, 42(2), 155–162.
<https://doi.org/10.1037/h0036215>
- Bem, S. L. (1977). On the utility of alternative procedures for assessing psychological androgyny. *Journal of Consulting and Clinical Psychology*, 45(2), 196–205.
<https://doi.org/10.1037/0022-006X.45.2.196>
- Bem, S. L. (1979). Theory and measurement of androgyny: A reply to the Pedhazur-Tetenbaum and Locksley-Colten critiques. *Journal of Personality and Social Psychology*, 37(6), 1047–1054. <https://doi.org/10.1037/0022-3514.37.6.1047>
- Bem, S. L. (1981). Gender schema theory: A cognitive account of sex typing. *Psychological Review*, 88(4), 354–364. <https://doi.org/10.1037/0033-295X.88.4.354>
- Bem, S. L. (1993). The lenses of gender—transforming the debate on sexual inequality. New Haven: Yale University Press.
- Berger, C., Alcalay, L., Torretti, A., & Milicic, N. (2011). Socio-emotional well-being and academic achievement: evidence from a multilevel approach. *Psicologia: Reflexão e Crítica*, 24(2), 344–351. <https://doi.org/10.1590/S0102-79722011000200016>
- Bierhoff-Alfermann, D. (1989). Androgynie. Möglichkeiten und Grenzen der Geschlechterrollen [Androgyny. Gender roles' opportunities and limitations]. Westdeutscher Verlag.
- Block, J. H. (1973). Conceptions of sex role: Some cross-cultural and longitudinal perspectives. *American Psychologist*, 28(6), 512–526.
<https://doi.org/10.1037/h0035094>
- Boldizar, J. P. (1991). Assessing sex typing and androgyny in children: The Children's Sex Role Inventory. *Developmental Psychology*, 27(3), 505–515.
<https://doi.org/10.1037/0012-1649.27.3.505>
- Bolzendahl, C. I., & Myers, D. J. (2004). Feminist Attitudes and Support for Gender Equality: Opinion Change in Women and Men, 1974-1998. *Social Forces*, 83(2), 759–789. <https://doi.org/10.1353/sof.2005.0005>
- Bradshaw, J., Keung, A., Rees, G., & Goswami, H. (2011). Children's subjective well-being: International comparative perspectives. *Children and Youth Services Review*, 33(4), 548–556. <https://doi.org/10.1016/j.childyouth.2010.05.010>

- Brown, B. B., & Larson, J. (2009). Peer Relationships in Adolescence. In R. M. Lerner and L. Steinberg (Eds.), *Handbook of Adolescent Psychology* (p. adlpsy002004). John Wiley and Sons, Inc. <https://doi.org/10.1002/9780470479193.adlpsy002004>
- Buchanan, K., & Bardi, A. (2015). The Roles of Values, Behavior, and Value-Behavior Fit in the Relation of Agency and Communion to Well-Being: Agency, Communion, and Well-Being. *Journal of Personality*, 83(3), 320–333. <https://doi.org/10.1111/jopy.12106>
- Bürger, S., Holzer, J., Yanagida, T., Schober, B., & Spiel, C. (2020). The German Version of the EPOCH Measure of Adolescent Well-Being Adapted for the School Context (EPOCH-G-S) -A Validation Study. Manuscript submitted for publication.
- Carver, C. S., Scheier, M. F., & Segerstrom, S. C. (2010). Optimism. *Clinical Psychology Review*, 30(7), 879–889. <https://doi.org/10.1016/j.cpr.2010.01.006>
- Carver, P. R., Yunger, J. L., & Perry, D. G. (2003). Gender Identity and Adjustment in Middle Childhood. *Sex Roles*, 49(3/4), 95–109. <https://doi.org/10.1023/A:1024423012063>
- Cejka, M. A., & Eagly, A. H. (1999). Gender-Stereotypic Images of Occupations Correspond to the Sex Segregation of Employment. *Personality and Social Psychology Bulletin*, 25(4), 413–423. <https://doi.org/10.1177/0146167299025004002>
- Chen, F., Zhu, S., & Bi, C. (2018). The Development of Self-Esteem and the Role of Agency and Communion: A Longitudinal Study among Chinese. *Journal of Child and Family Studies*, 27(3), 816–824. <https://doi.org/10.1007/s10826-017-0942-y>
- Choudhury, S., Blakemore, S.-J., & Charman, T. (2006). Social cognitive development during adolescence. *Social Cognitive and Affective Neuroscience*, 1(3), 165–174. <https://doi.org/10.1093/scan/nsl024>
- Cooper, P. J., Pauletti, R. E., Tobin, D. D., Menon, M., Menon, M., Spatta, B. C., Hodges, E. V. E., & Perry, D. G. (2013). Mother-Child Attachment and Gender Identity in Preadolescence. *Sex Roles*, 69(11–12), 618–631. <https://doi.org/10.1007/s11199-013-0310-3>
- Corby, B. C., Hodges, E. V. E., & Perry, D. G. (2007). Gender identity and adjustment in black, Hispanic, and white preadolescents. *Developmental Psychology*, 43(1), 261–266. <https://doi.org/10.1037/0012-1649.43.1.261>

- Duckworth, A. L., & Seligman, M. E. P. (2006). Self-discipline gives girls the edge: Gender in self-discipline, grades, and achievement test scores. *Journal of Educational Psychology*, 98(1), 198–208. <https://doi.org/10.1037/0022-0663.98.1.198>
- Eccles, J. S., & Roeser, R. W. (2011). Schools as Developmental Contexts During Adolescence: SCHOOLS AS DEVELOPMENTAL CONTEXTS. *Journal of Research on Adolescence*, 21(1), 225–241. <https://doi.org/10.1111/j.1532-7795.2010.00725.x>
- Eccles, J. S. (2004). Schools, academic motivation, and stage-environment fit. In R. M. Lerner and L. Steinberg (Eds.), *Handbook of adolescent psychology* (p. 125–153). John Wiley and Sons Inc.
- Egan, S. K., & Perry, D. G. (2001). Gender identity: A multidimensional analysis with implications for psychosocial adjustment. *Developmental Psychology*, 37(4), 451–463. <https://doi.org/10.1037/0012-1649.37.4.451>
- Elmore, G. M., & Huebner, E. S. (2010). Adolescents' satisfaction with school experiences: Relationships with demographics, attachment relationships, and school engagement behavior. *Psychology in the Schools*, 47(6), 525–537. <https://doi.org/10.1002/pits.20488>
- Epstein, J. L., & Mcpartland, J. M. (1976). The Concept and Measurement of the Quality of School Life. *American Educational Research Journal*, 13(1), 15–30. <https://doi.org/10.3102/00028312013001015>
- Fournier, M. A., & Moskowitz, D. S. (2000). The mitigation of interpersonal behavior. *Journal of Personality and Social Psychology*, 79(5), 827–836. <https://doi.org/10.1037/0022-3514.79.5.827>
- Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. *Review of Educational Research*, 74(1), 59-109. <https://doi.org/10.3102/00346543074001059>
- Frymier, A. B., & Houser, M. L. (2000) The teacher-student relationship as an interpersonal relationship, *Communication Education*, 49:3, 207-219, <https://doi.org/10.1080/03634520009379209>
- Gebauer, J. E., Wagner, J., Sedikides, C., & Neberich, W. (2013). Agency-Communion and Self-Esteem Relations Are Moderated by Culture, Religiosity, Age, and Sex: Evidence for the “Self-Centrality Breeds Self-Enhancement” Principle: Agency-

- Communion and Self-Esteem. *Journal of Personality*, 81(3), 261–275.
<https://doi.org/10.1111/j.1467-6494.2012.00807.x>
- Gilbert, L. A. (1981). Toward mental health: The benefits of psychological androgyny. *Professional Psychology*, 12(1), 29–38. <https://doi.org/10.1037/0735-7028.12.1.29>
- Gilman, R., & Huebner, E. (2000). Review of Life Satisfaction Measures for Adolescents. *Behaviour Change*, 17(3), 178-195. <https://10.1375/behc.17.3.178>
- Gilman, R., & Huebner, E. S. (2006). Characteristics of Adolescents Who Report Very High Life Satisfaction. *Journal of Youth and Adolescence*, 35(3), 293–301.
<https://doi.org/10.1007/s10964-006-9036-7>
- Goldbeck, L., Schmitz, T.G., Besier, T., Herschbach, P., & Henrich G. (2007). Life satisfaction decreases during adolescence. *Quality of Life Research* 16, 969–979.
<https://doi.org/10.1007/s11136-007-9205-5>
- González-Carrasco, M., Casas, F., Malo, S., Viñas, F., & Dinisman, T. (2017). Changes with Age in Subjective Well-Being Through the Adolescent Years: Differences by Gender. *Journal of Happiness Studies*, 18, 63–88.
<https://doi.org/10.1007/s10902-016-9717-1>
- Greenberg, M. T., Siegel, J. M., & Leitch, C. J. (1983). The nature and importance of attachment relationships to parents and peers during adolescence. *Journal of Youth and Adolescence*, 12(5), 373–386. <https://doi.org/10.1007/BF02088721>
- Hall, J. A., & Halberstadt, A. G. (1980). Masculinity and femininity in children: Development of the Children's Personal Attributes Questionnaire. *Developmental Psychology*, 16(4), 270–280. <https://doi.org/10.1037/0012-1649.16.4.270>
- Han, M. F., Ybarra, O., & Bi, C. Z. (2015). Chinese adjective words system for fundamental dimensions of social cognition. *Journal of Southwest University (Natural Science Edition)*, 37(8), 144–148.
<https://doi.org/10.13718/j.cnki.xdzk.2015.08.024>
- Haranin, E. C., Huebner, E. S., & Suldo, S. M. (2007). Predictive and Incremental Validity of Global and Domain-Based Adolescent Life Satisfaction Reports. *Journal of Psychoeducational Assessment*, 25(2), 127–138.
<https://doi.org/10.1177/0734282906295620>

- Hartley, B. L., & Sutton, R. M. (2013). A Stereotype Threat Account of Boys' Academic Underachievement. *Child Development*, 84(5), 1716–1733.
<https://doi.org/10.1111/cdev.12079>
- Helgeson, V. S. (1994). Relation of agency and communion to well-being: Evidence and potential explanations. *Psychological Bulletin*, 116(3), 412–428.
<https://doi.org/10.1037/0033-2909.116.3.412>
- Helgeson, V. S., & Palladino, D. K. (2012). Implications of Psychosocial Factors for Diabetes Outcomes among Children with Type 1 Diabetes: A Review: Psychosocial Factors in Diabetes. *Social and Personality Psychology Compass*, 6(3), 228–242. <https://doi.org/10.1111/j.1751-9004.2011.00421.x>
- Heyder, A., & Kessels, U. (2013). Is School Feminine? Implicit Gender Stereotyping of School as a Predictor of Academic Achievement. *Sex Roles*, 69(11–12), 605–617. <https://doi.org/10.1007/s11199-013-0309-9>
- Hill, J. P., & Lynch, M. E. (1983). The Intensification of Gender-Related Role Expectations during Early Adolescence. In J. Brooks-Gunn and A. C. Petersen (Eds.), *Girls at Puberty* (pp. 201–228). Springer. https://doi.org/10.1007/978-1-4899-0354-9_10
- Huebner, E. S. (1994). Preliminary development and validation of a multidimensional life satisfaction scale for children. *Psychological Assessment*, 6(2), 149–158.
<https://doi.org/10.1037/1040-3590.6.2.149>
- Huebner, E. S., Valois, R. F., Paxton, R. J., & Drane, J. W. (2005). Middle school students' perceptions of quality of life. *Journal of Happiness Studies*, 6(1), 15–24.
<https://doi.org/10.1007/s10902-004-1170-x>
- Huppert, F. A. (2014). The State of Wellbeing Science: Concepts, Measures, Interventions, and Policies. In C. L. Cooper (Ed.), *Wellbeing* (pp. 1–49). John Wiley and Sons, Ltd. <https://doi.org/10.1002/9781118539415.wbwell036>
- Jourdan, D., Samdal, O., Diagne, F., & Carvalho, G. S. (2008). The future of health promotion in schools goes through the strengthening of teacher training at a global level. *Promotion and Education*, 15(3), 36–38.
<https://doi.org/10.1177/1025382308095657>
- Kahneman, D. (1999). Objective happiness. In D. Kahneman, E. Diener, and N. Schwarz (Eds.), *Well-being: The foundations of hedonic psychology* (p. 3–25). Russell Sage Foundation.

- Karasawa, M., Curhan, K. B., Markus, H. R., Kitayama, S. S., Love, G. D., Radler, B. T., & Ryff, C. D. (2011). Cultural Perspectives on Aging and Well-Being: A Comparison of Japan and the United States. *The International Journal of Aging and Human Development*, 73(1), 73–98. <https://doi.org/10.2190/AG.73.1.d>
- Karatzias, A., Power, K. G., & Swanson, V. (2001). Quality of School Life: Development and Preliminary Standardisation of an Instrument Based on Performance Indicators in Scottish Secondary Schools. *School Effectiveness and School Improvement*, 12(3), 265–284. <https://doi.org/10.1076/sesi.12.3.265.3449>
- Kasser, T., & Ryan, R. M. (1996). Further Examining the American Dream: Differential Correlates of Intrinsic and Extrinsic Goals. *Personality and Social Psychology Bulletin*, 22(3), 280–287. <https://doi.org/10.1177/0146167296223006>
- Kern, M. L., Benson, L., Steinberg, E. A., & Steinberg, L. (2016). The EPOCH Measure of Adolescent Well-Being. *Psychological Assessment*, 28(5), 586–597. <https://doi.org/10.1037/pas0000201>
- Kern, M. L., Waters, L. E., Adler, A., & White, M. A. (2015). A multidimensional approach to measuring well-being in students: Application of the PERMA framework. *The Journal of Positive Psychology*, 10(3), 262–271. <https://doi.org/10.1080/17439760.2014.936962>
- Klaczynski, P. A., Felmban, W. S., & Kole, J. (2020). Gender Intensification and Gender Generalization Biases in Pre-adolescents, Adolescents, and Emerging Adults. *British Journal of Developmental Psychology*, 38(3), 415–433. <https://doi.org/10.1111/bjdp.12326>
- Kollmayer, M., Schultes, M.-T., Lüftenegger, M., Finsterwald, M., Spiel, C., & Schober, B. (2020). REFLECT – A Teacher Training Program to Promote Gender Equality in Schools. *Frontiers in Education*, 5:136. <https://doi.org/10.3389/educ.2020.00136>
- Konu, A., & Lintonen, T. (2006). Theory-based survey analysis of well-being in secondary schools in Finland. *Health Promotion International*, 21(1), 27–36. <https://doi.org/10.1093/heapro/dai028>
- Krahé, B., Berger, A., & Möller, I. (2007). Entwicklung und Validierung eines Inventars zur Erfassung des Geschlechtsrollen-Selbstkonzepts im Jugendalter. *Zeitschrift Fur Sozialpsychologie - Z SOZPSYCHOL*, 38, 195–208. [10.1024/0044-3514.38.3.195](https://doi.org/10.1024/0044-3514.38.3.195)

- Lam, C. B., & McBride-Chang, C. A. (2007). Resilience in Young Adulthood: The Moderating Influences of Gender-related Personality Traits and Coping Flexibility. *Sex Roles*, 56(3–4), 159–172. <https://doi.org/10.1007/s11199-006-9159-z>
- Lamke, L. K. (1982). Adjustment and sex-role orientation in adolescence. *Journal of Youth and Adolescence*, 11(3), 247–259. <https://doi.org/10.1007/BF01537470>
- Laski, L. (2015). Realizing the health and wellbeing of adolescents. *BMJ*, h4119. <https://doi.org/10.1136/bmj.h4119>
- Lewis, A. D., Huebner, E. S., Malone, P. S., & Valois, R. F. (2011). Life Satisfaction and Student Engagement in Adolescents. *Journal of Youth and Adolescence*, 40(3), 249–262. <https://doi.org/10.1007/s10964-010-9517-6>
- Locksley, A., & Colten, M. E. (1979). Psychological androgyny: A case of mistaken identity? *Journal of Personality and Social Psychology*, 37(6), 1017–1031. <https://doi.org/10.1037/0022-3514.37.6.1017>
- Long, R. F., & Huebner, E. S. (2014). Differential Validity of Global and Domain-Specific Measures of Life Satisfaction in the Context of Schooling. *Child Indicators Research*, 7(3), 671–694. <https://doi.org/10.1007/s12187-013-9231-5>
- Long, R. F., Huebner, E. S., Wedell, D. H., & Hills, K. J. (2012). Measuring school-related subjective well-being in adolescents. *American Journal of Orthopsychiatry*, 82(1), 50–60. <https://doi.org/10.1111/j.1939-0025.2011.01130.x>
- Markstrom-Adams, C. (1989). Androgyny and its relation to adolescent psychosocial well-being: A review of the literature. *Sex Roles: A Journal of Research*, 21(5-6), 325–340. <https://doi.org/10.1007/BF00289595>
- Massad, C. M. (1981). Sex role identity and adjustment during adolescence. *Child Development* 42, 1290-1298.
- Matud, M.P., López-Curbelo, M., & Fortes, D. (2019). Gender and Psychological Well-Being. *Int. J. Environ. Res. Public Health* 16, 3531.
- McKnight, C. G., Huebner, E. S., & Suldo, S. (2002). Relationships among stressful life events, temperament, problem behavior, and global life satisfaction in adolescents. *Psychology in the Schools*, 39(6), 677–687. <https://doi.org/10.1002/pits.10062>

- OECD. (2019). PISA 2018 Well-being Framework. In OECD, *PISA 2018 Assessment and Analytical Framework* (pp. 257–298). OECD.
<https://doi.org/10.1787/38a34353-en>
- Park, N. (2004). The Role of Subjective Well-Being in Positive Youth Development. *The ANNALS of the American Academy of Political and Social Science*, 591(1), 25–39. <https://doi.org/10.1177/0002716203260078>
- Pauletti, R. E., Menon, M., Cooper, P. J., Aults, C. D., & Perry, D. G. (2017). Psychological Androgyny and Children’s Mental Health: A New Look with New Measures. *Sex Roles*, 76(11–12), 705–718. <https://doi.org/10.1007/s11199-016-0627-9>
- Prakash, J., Ryali, V. S. S., Bhat, P., Kotwal, A. S., Srivastava, K., & Shashikumar, R. (2010). Does androgyny have psychoprotective attributes? A cross-sectional community-based study. *Industrial Psychiatry Journal*, 19(2), 119.
<https://doi.org/10.4103/0972-6748.90343>
- Priess, H. A., Lindberg, S. M., & Hyde, J. S. (2009). Adolescent Gender-Role Identity and Mental Health: Gender Intensification Revisited. *Child Development*, 80(5), 1531–1544. <https://doi.org/10.1111/j.1467-8624.2009.01349.x>
- Pyhältö, K., Soini, T., & Pietarinen, J. (2010). Pupils’ pedagogical well-being in comprehensive school—significant positive and negative school experiences of Finnish ninth graders. *European Journal of Psychology of Education*, 25(2), 207–221. <https://doi.org/10.1007/s10212-010-0013-x>
- Roos, P. E., & Cohen, L. H. (1987). Sex roles and social support as moderators of life stress adjustment. *Journal of Personality and Social Psychology*, 52(3), 576–585.
<https://doi.org/10.1037/0022-3514.52.3.576>
- Ryan, A. M. (2001). The Peer Group as a Context for the Development of Young Adolescent Motivation and Achievement. *Child Development*, 72(4), 1135–1150.
<https://doi.org/10.1111/1467-8624.00338>
- Ryan, R. M., & Deci, E. L. (2001). On Happiness and Human Potentials: A Review of Research on Hedonic and Eudaimonic Well-Being. *Annual Review of Psychology*, 52(1), 141–166. <https://doi.org/10.1146/annurev.psych.52.1.141>
- Sandstrom, G. M., & Dunn, E. W. (2014). Social Interactions and Well-Being: The Surprising Power of Weak Ties. *Personality and Social Psychology Bulletin*, 40(7), 910–922. <https://doi.org/10.1177/0146167214529799>

- Saragovi, C., Aubé, J., Koestner, R., & Zuroff, D. (2002). Traits, Motives, and Depressive Styles as Reflections of Agency and Communion. *Personality and Social Psychology Bulletin*, 28(5), 563–577. <https://doi.org/10.1177/0146167202288001>
- Saragovi, C., Koestner, R., Di Dio, L., & Aubé, J. (1997). Agency, communion, and well-being: Extending Helgeson's (1994) model. *Journal of Personality and Social Psychology*, 73(3), 593–609. <https://doi.org/10.1037/0022-3514.73.3.593>
- Seligman, M. E. P., & Csikszentmihalyi, M. (2000). Positive psychology: An introduction. *American Psychologist*, 55(1), 5–14. <https://doi.org/10.1037/0003-066X.55.1.5>
- Seligman, M. E. P. (2011). *Flourish: A visionary new understanding of happiness and well-being*. Free Press.
- Sheldon, K. M., & Cooper, M. L. (2008). Goal Striving Within Agentic and Communal Roles: Separate but Functionally Similar Pathways to Enhanced Well-Being. *Journal of Personality*, 76(3), 415–448. <https://doi.org/10.1111/j.1467-6494.2008.00491.x>
- Silvern, L. E., & Ryan, V. L. (1979). Self-rated adjustment and sex-typing on the Bem Sex-Role Inventory: Is masculinity the primary predictor of adjustment? *Sex Roles*, 5(6), 739–763. <https://doi.org/10.1007/BF00287936>
- Skinner, O. D., McHale, S. M., Wood, D., & Telfer, N. A. (2019). Gender-Typed Personality Qualities and African American Youth's School Functioning. *Journal of Youth and Adolescence*, 48(4), 680–691. <https://doi.org/10.1007/s10964-018-0919-1>
- Smith, T. E., & Leaper, C. (2006). Self-Perceived Gender Typicality and the Peer Context During Adolescence. *Journal of Research on Adolescence*, 16(1), 91–104. <https://doi.org/10.1111/j.1532-7795.2006.00123.x>
- Spence, J. T. (1991). Do The Bsri and Paq Measure the Same or Different Concepts? *Psychology of Women Quarterly*, 15(1), 141–165. <https://doi.org/10.1111/j.1471-6402.1991.tb00483.x>
- Spence, J. T., & Helmreich, R. L. (1979). Comparison of Masculine and Feminine Personality Attributes and Sex-Role Attitudes Across Age Groups. *Developmental Psychology*, 15(5), 583–584. <https://doi.org/10.1037/h0078091>

- Spence, J. T., Helmreich, R., & Stapp, J. (1975). Ratings of self and peers on sex role attributes and their relation to self-esteem and conceptions of masculinity and femininity. *Journal of Personality and Social Psychology*, 32(1), 29–39.
<https://doi.org/10.1037/h0076857>
- Spence, J.T. (1984). Gender identity and its implications for the concepts of masculinity and femininity. *Nebr Symp Motiv.*, 32, 59-95. PMID: 6398859.
- Suldo, S. M., & Huebner, E. S. (2004). Does life satisfaction moderate the effects of stressful life events on psychopathological behavior during adolescence? *School Psychology Quarterly*, 19(2), 93–105. <https://doi.org/10.1521/scpq.19.2.93.33313>
- Suldo, S. M., Riley, K. N., & Shaffer, E. J. (2006). Academic Correlates of Children and Adolescents' Life Satisfaction. *School Psychology International*, 27(5), 567–582. <https://doi.org/10.1177/0143034306073411>
- Tian, L., Chen, H., & Huebner, E. S. (2014). The Longitudinal Relationships Between Basic Psychological Needs Satisfaction at School and School-Related Subjective Well-Being in Adolescents. *Social Indicators Research*, 119(1), 353–372.
<https://doi.org/10.1007/s11205-013-0495-4>
- Verhoeven, M., Poorthuis, A. M. G., & Volman, M. (2019). The Role of School in Adolescents' Identity Development. A Literature Review. *Educational Psychology Review*, 31(1), 35–63. <https://doi.org/10.1007/s10648-018-9457-3>
- Viejo, C., Gómez-López, M., & Ortega-Ruiz, R. (2018). Adolescents' Psychological Well-Being: A Multidimensional Measure. *Int. J. Environ. Res. Public Health*, 15, 2325.
- Vonk, R., & Ashmore, R. D. (1993). The Multifaceted Self: Androgyny Reassessed by Open-Ended Self-Descriptions. *Social Psychology Quarterly*, 56(4), 278.
<https://doi.org/10.2307/2786664>
- Wells, K. (1980). Gender-role identity and psychological adjustment in adolescence. *Journal of Youth and Adolescence*, 9(1), 59–73.
<https://doi.org/10.1007/BF02088380>
- Whitley, B. E. (1983). Sex role orientation and self-esteem: A critical meta-analytic review. *Journal of Personality and Social Psychology*, 44(4), 765–778.
<https://doi.org/10.1037/0022-3514.44.4.765>
- Whitley, B. E. (1985). Sex-role orientation and psychological well-being: Two meta-analyses. *Sex Roles*, 12(1–2), 207–225. <https://doi.org/10.1007/BF00288048>

- Wichstrøm, L. (1999). The emergence of gender difference in depressed mood during adolescence: The role of intensified gender socialization. *Developmental Psychology*, 35(1), 232–245. <https://doi.org/10.1037/0012-1649.35.1.232>
- Wigfield, A., Eccles, J. S., Schiefele, U., Roeser, R. W., & Davis-Kean, P. (2006). Development of Achievement Motivation. In N. Eisenberg, W. Damon, and R. M. Lerner (Eds.), *Handbook of child psychology: Social, emotional, and personality development* (p. 933–1002). John Wiley and Sons, Inc.
- Woodhill, B. M., & Samuels, C. A. (2003). Positive and Negative Androgyny and Their Relationship with Psychological Health and Well-Being. *Sex Roles: A Journal of Research*, 48(11-12), 555–565. <https://doi.org/10.1023/A:1023531530272>
- Wolfram, H.-J., Mohr, G., & Borchert, J. (2009). Gender Role Self-concept, Gender-role Conflict, and Well-being in Male Primary School Teachers. *Sex Roles*, 60(1–2), 114–127. <https://doi.org/10.1007/s11199-008-9493-4>
- Yunger, J. L., Carver, P. R., & Perry, D. G. (2004). Does Gender Identity Influence Children's Psychological Well-Being? *Developmental Psychology*, 40(4), 572–582. <https://doi.org/10.1037/0012-1649.40.4.572>
- Žukauskienė, R. (2014). Adolescence and Well-Being. In A. Ben-Arieh, F. Casas, I. Frønes, and J. E. Korbin (Eds.), *Handbook of Child Well-Being* (pp. 1713–1738). Springer. https://heyder.org/10.1007/978-90-481-9063-8_67

Table 1

Means and standard deviations for overall school-related well-being by gender role self-concept and sex

Gender role self-concept	Sex	<i>N</i>	<i>M</i>	<i>SD</i>
Andogynous	boys	163	3.71	0.54
	girls	216	3.78	0.54
Masculine	boys	128	3.26	0.53
	girls	58	3.54	0.53
Feminine	boys	53	3.32	0.49
	girls	121	3.48	0.49
Undifferentiated	boys	133	3.11	0.59
	girls	124	3.22	0.55

Table 2

Correlations between EPOCH dimensions

	1	2	3	4	5
Engagement	1	.553**	.341**	.076*	.349**
Perseverance		1	.426**	.141**	.390**
Connectedness			1	.274**	.584**
Optimism				1	.425**
Happiness					1

Table 3

Means and standard deviations for EPOCH dimensions by gender role self-concept and sex

Gender role self-concept	Sex	Engagement			Perseverance		Optimism		Connectedness		Happiness	
		<i>N</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Androgynous	boys	163	3.07	.85	3.81	.74	3.72	.81	4.15	.72	3.77	.87
	girls	216	3.08	.80	3.93	.77	3.57	.79	4.34	.68	3.86	.86
Masculine	boys	128	2.61	.85	3.29	.85	3.25	.83	3.85	.68	3.32	.91
	girls	58	2.79	.74	3.67	.83	3.41	.88	4.19	.73	3.61	.80
Feminine	boys	53	2.64	.75	3.60	.78	3.37	.74	3.76	.90	3.25	.93
	girls	121	2.80	.77	3.62	.75	3.32	.82	4.15	.77	3.47	.84
Undifferentiated	boys	133	2.56	.89	3.49	.84	3.14	.88	3.51	.83	3.14	.89
	girls	124	2.76	.80	3.71	.80	2.91	.80	3.76	.86	3.18	.84

4th Publication: Korlat, S., Kollmayer, M., Holzer, J., Lüftenegger, M., Pelikan, E., Schober, B., & Spiel, C. (2021). Gender Differences in Digital Learning During COVID-19: Competence Beliefs, Intrinsic Value, Learning Engagement, and Perceived Teacher Support. *Frontiers in Psychology*, 12: 637776, 1-12. <https://doi.org/10.3389/fpsyg.2021.637776>

Selma Korlat prepared the data, conducted and interpreted data analyses and drafted the manuscript.

Marlene Kollmayer contributed to the final version of the manuscript.

Julia Holzer, Marko Lüftenegger and **Elisabeth Pelikan** participated in the design and coordination of the study and contributed to the final version of the manuscript.

Barbara Schober conceived the study design and contributed to the final version of the manuscript.

Christiane Spiel supervised the manuscript preparation and contributed to the final version of the manuscript.

All authors read and approved the final manuscript.



OPEN ACCESS

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Specialty section:

This article was submitted to
Educational Psychology,
a section of the journal
Frontiers in Psychology

Received: 04 December 2020

Accepted: 26 February 2021

Published: 30 March 2021

Citation:

Korlat S, Kollmayer M, Holzer J,
Lüftenegger M, Pelikan ER, Schober B
and Spiel C (2021) Gender Differences
in Digital Learning During COVID-19:
Competence Beliefs, Intrinsic Value,
Learning Engagement, and Perceived
Teacher Support.
Front. Psychol. 12:637776.
doi: 10.3389/fpsyg.2021.637776

Gender Differences in Digital Learning During COVID-19: Competence Beliefs, Intrinsic Value, Learning Engagement, and Perceived Teacher Support

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The spread of the COVID-19 pandemic quickly necessitated digital learning, which bore challenges for all pupils but especially for groups disadvantaged in a virtual classroom. As some studies indicate persistent differences between boys and girls in use of technologies and related skills, the aim of this study was to investigate gender differences in the digital learning environment students faced in spring 2020. Previous studies investigating gender differences in digital learning largely used biological sex as the only indicator of gender. This study includes both biological sex and gender role self-concept in order to investigate the role of gender in different components of this stereotyped domain in a more differentiated way. A total of 19,190 Austrian secondary school students (61.9% girls, $M_{age} = 14.55$, $SD_{age} = 2.49$, age range 10–21) participated in an online study in April 2020 and answered questions regarding their competence beliefs, intrinsic value, engagement, and perceived teacher support in digital learning during the pandemic-induced school closures. Results showed higher perceived teacher support, intrinsic value, and learning engagement among girls than boys, while no significant sex differences were found in competence beliefs regarding digital learning. Furthermore, our results indicated clear benefits of an androgynous gender role self-concept for all studied components of digital learning. Implications of the findings for theory and practice are discussed.

Keywords: gender differences, gender role self-concept, digital learning, COVID-19, adolescents

INTRODUCTION

Due to the spread of COVID-19, countries worldwide implemented unprecedented measures in various sectors of society to contain the pandemic (OECD, 2020). This situation affected the education sector as well, causing the largest disruption of education systems in history (UN, 2020). As of March 2020, a majority of countries had announced temporary school closures, preventing around 1.6 billion children and young people from physically attending school (UNICEF, 2020). As a response, most schools switched to digital learning, creating a unique situation for all actors in the education field (UN, 2020). While various European Union bodies and international

organizations had long called for technology adoption in education systems (OECD, 2001; European Commission, 2018), most European school systems had continued to employ face-to-face teaching as their main *modus operandi* before COVID-19 (Wahlmüller-Schiller, 2017; Schrenk, 2020). The urgent imperative to move online following the outbreak of the virus forced digital learning upon unprepared school systems (Hodges et al., 2020), putting at risk all pupils but especially groups that might be particularly disadvantaged in the virtual classroom. UNESCO and scholars have called for recognizing the gender dimension of school closures due to COVID-19, especially in light of the gender digital gap (IIEP-UNESCO, 2020; Nefesh-Clarke et al., 2020). As there are studies indicating that gender differences persist in use of technologies and related skills (Kayany and Yelsma, 2000; Colley and Comber, 2003; Li and Kirkup, 2007; Drabowicz, 2014), it is critical to investigate gender differences in important components of digital learning—a stereotyped domain that became a necessity in schoolchildren lives during COVID pandemic.

Gender Differences in Stereotyped Domains

In line with gender stereotypes associating technical and math-intensive fields with masculine qualities (Charles and Bradley, 2009), computers and technology use have been perceived as masculine and therefore more suitable for boys than girls (Cooper, 2006; Adamus et al., 2009). The “digital gender gap” begins in early childhood, as parents and teachers act in accordance with the perception that computers are a male domain (Young, 2000). From earliest infancy, boys’ activities and toys tend to relate to technology and action, whereas girls’ activities and toys relate to nurturance and beauty (Blakemore and Centers, 2005; Kollmayer et al., 2018). Similarly, it has been shown that parents provide boys with more opportunities to do computing and sports, whereas girls are enabled more to read and to interact socially with their peers (Eccles et al., 1993). Hence, these gendered experiences can undermine girls’ confidence in their abilities and interest in computing-related subjects (Eccles, 2009). Accordingly, by the time of adolescence, boys report higher frequency of computer use and greater self-confidence in dealing with computers (Colley and Comber, 2003; Mucherah, 2003), display greater digital skills (Kayany and Yelsma, 2000; Li and Kirkup, 2007), and in general are more attracted to computers than girls (Mumtaz, 2001; Volman and van Eck, 2001; Colley and Comber, 2003). Similarly, it has been found that boys describe themselves in relation to computers (e.g., “computer freak” or “I like computers”) significantly more often than girls (Korlat et al., 2021). Newer studies support the finding that computer use for both education and entertainment purposes is more frequent among boys (Drabowicz, 2014). Girls, on the other hand, seem to use computers and the internet more for communication and social networking (McSporran and Young, 2001). As boys’ and girls’ motivational beliefs and behaviors are shaped by their experiences and are a result of gendered socialization processes (Eccles, 1994; Meece et al., 2006), the gender digital gap corresponds to societal gender stereotypes

that portray boys as autonomous, independent, and good at technology-related domains and girls as gentle, sociable, and good at nurturing domains. Not only can this influence girls’ use of computers but it may also have far-reaching consequences for girls’ education and career selection (Van Grootel et al., 2018), thus contributing to the “leaky pipeline” in science, technology, engineering, and mathematics (STEM) as well as the continued gendered division of labor (Wood and Eagly, 2012).

Eccles-Parsons et al. (1983) developed a model to explain gender differences in adolescents’ achievement choices and lower proportion of girls and women in advanced high school math courses or math and science careers (Wigfield and Eccles, 2020). According to their *expectancy-value model* (Eccles-Parsons et al., 1983; Wigfield and Eccles, 2000), students are more likely to engage in academic activities within the range of their perceived ability to successfully perform them (competence beliefs) and which they consider valuable in terms of the enjoyment they will get from the task (subjective task value). Previous studies found both competence beliefs and values as important predictors for engagement and achievement in gender-stereotyped STEM subjects (Chow et al., 2012; Watt et al., 2012). However, there is evidence of gender differences in both ability-related and subjective task value-related beliefs in stereotyped domains (Eccles, 2009). For instance, girls reported lower competence beliefs in sports but higher competence beliefs in language arts compared to boys (Jacobs et al., 2002; Lupart et al., 2004). Similarly, some studies showed lower competence beliefs in mathematics for girls compared to boys (e.g., Lupart et al., 2004; Herbert and Stipek, 2005). In the similar vein, girls reported liking math and physics less than boys and rated math as less useful than boys (Eccles and Harold, 1991; Eccles, 2011). Persistent differences favoring boys has been found also for engagement in STEM fields (e.g., Moss-Racusin et al., 2018). To explain these sex differences in stereotyped domains, Eccles-Parsons et al. (1983) theorized that men and women acquire different patterns of competence beliefs and values, and consequently different levels of engagement across various activities, which are aligned with their gender role due to divergent gender-role socialization. In a longitudinal study of adolescent life transitions, they found that girls placed more value than boys on the importance of making occupational sacrifices for one’s family, whereas boys placed more value on seeking out challenging tasks and doing work that involves the use of math and computers (Eccles, 2007). The authors argued that, when investigating precursors of competence beliefs and values, focus should not be merely on sex differences but on gender roles and level of fitness of the task with one’s gender role self-concept developed through the socialization process (see Eccles, 2009).

The Role of Gender in Digital Learning

As girls seem to face specific barriers and difficulties in their experiences with computers and information and communication technologies (ICT) in general, concerns about equity in digital learning have been raised (Yates, 2001; Price, 2006). Specifically, it has been suggested that boys may have an advantage over girls in the online classroom solely based on their higher perceived ability, comfort, and engagement

with computers (Ashong and Commander, 2012). However, the results of studies investigating sex differences in this context are heterogeneous. While boys have a clear advantage over girls in confidence in their ICT abilities (Mumtaz, 2001; Durndell and Haag, 2002; Broos, 2005; Broos and Roe, 2006; Meelissen and Drent, 2007)—and this pattern seems to be quite consistent from elementary school to university (see Vekiri and Chronaki, 2008, for a review)—a more recent meta-analysis with university students revealed higher competence beliefs regarding learning in digital setting in young women compared to young men (Perkowski, 2013). This might be due to higher academic competence beliefs in girls and women (Britner and Pajares, 2001) that annuls the negative stereotyped effects in this digital context. When it comes to values toward ICT and digital learning, some research has shown that girls tend to have less positive beliefs about the value of ICT and about their own ICT skills compared to boys (Volman and van Eck, 2001), have less positive perceptions of digital learning (Ong and Lai, 2006), and have lower satisfaction with digital learning than male students (Lu and Chiou, 2010). On the other hand, there are studies suggesting that there are no differences between boys and girls in attitudes toward digital learning (Cuadrado-García et al., 2010; Hung et al., 2010) or in average ICT participation and motivation (Cuadrado-García et al., 2010). Other studies indicate advantages for girls when it comes to learning motivation in digital contexts (e.g., McSporrán and Young, 2001; Price, 2006). In general, some authors argue that sex differences in digital competence, attitudes, and motivation are becoming less prevalent, indicating a narrowing of the gender digital gap (e.g., Vekiri, 2013).

However, as ICT is perceived as a stereotypically masculine field, it seems plausible that gender differences in digital learning map onto students' gender role self-concepts rather than their biological sex. The recognition that individuals can describe themselves in terms of both stereotypically feminine and stereotypically masculine attributes regardless of their biological sex has led to an increased focus on gender role self-concept and its relationship with gendered domains (e.g., Athenstaedt, 2002; Kessels and Steinmayr, 2013; Wolter and Hannover, 2016). Previous studies have shown that adolescents who describe themselves using masculine qualities (e.g., independent, competitive, and brave) have higher perceived mathematics-related competence (Wolter and Hannover, 2016) and performance (Signorella and Jamison, 1986), whereas adolescents who describe themselves with feminine traits (e.g., gentle, kind, and sensitive) have better reading performance and motivation in reading—a stereotypically feminine domain (McGeown et al., 2012; Wolter and Hannover, 2016). Furthermore, it has been found that individuals high on both masculinity and femininity—androgynous individuals—are more flexible and adaptable to different situations, as they possess a broader repertoire of traits and behaviors (e.g., Bem, 1981; Pauletti et al., 2017). Conversely, individuals scoring low on both dimensions—undifferentiated individuals—exhibit the lowest levels of adaptability and functioning (Markstrom-Adams, 1989; Pauletti et al., 2017). Despite the significant role of gender role self-concept for adolescents' competence and value-related beliefs and engagement regarding gendered domains, studies

investigating gender differences in digital learning have so far concentrated on biological sex only, neglecting the role of gender role self-concept. Moreover, all previous studies on sex differences in digital learning were conducted pre-pandemic when pupils were not necessarily continuously exposed to it, especially not in the mandatory and exclusive form of learning as they are during the pandemic lockdowns. Therefore, the goal of this study was to include both biological sex and gender role self-concept in order to investigate gender differences in digital learning context during pandemic-induced school closures.

Perceived Support

Except for personal characteristics such as one's gender identity, learning achievement is influenced by a broad array of social factors, which include socializers' (especially parents' and teachers') beliefs and behaviors (Eccles, 2009). Although parental beliefs are significant predictors of youths' motivational beliefs and behavior (Eccles et al., 1993; Simpkins et al., 2012), studies have indicated that support from teachers most accurately predicts school-related variables (Ryan et al., 1994; Demaray et al., 2005). Indeed, it has been shown that teachers' support is positively related to competence beliefs regarding academic skills (Patrick et al., 2007), intrinsic motivation (Ryan et al., 1994), and achievement. Some studies report higher levels of perceived teacher affective support among girls (e.g., Reddy et al., 2003), whereas other studies indicate that boys and girls perceive similar levels of teacher support (Malecki and Demaray, 2003; De Wit et al., 2010). Teachers' ability expectations are influenced by their domain-specific gender stereotypes (Chalabaev et al., 2009), which can influence boys' and girls' competence beliefs about ICT through differences in communication patterns or pedagogical practices (Crombie et al., 2002). However, research investigating teacher support for boys' and girls' digital learning are scarce. Vekiri (2010), for instance, found no differences between boys and girls in perceived teacher expectations and support but a stronger association between teacher support and girls' competence beliefs. Nevertheless, perceived teacher support is even more important in digital learning setting, particularly in a situation such as the COVID-19 pandemic, in which students' motivation may begin to degrade if they lack the motivational regulation needed to succeed in this learning setting (Fryer and Bovee, 2016).

Present Study

The primary goal of the current study is to test gender differences within the expectancy-value model (Eccles-Parsons et al., 1983; Eccles, 2005) in components of digital learning relevant for learning process during pandemic-induced school closures. As the model posits different patterns of competence and value-related beliefs and engagement across various activities associated with gender roles in boys and girls (Eccles, 2009), this study encompasses both biological sex as well as gender role self-concept in investigating gender differences in digital learning during COVID-19 pandemic. Although Eccles and colleagues have suggested gender roles as a factor influencing attainment value as an aspect of subjective task value that is most related to broader identity issues (cf., Eccles, 2009), a recent

study showed that components of students' task values (intrinsic, attainment, and utility values) relate to one another, with the correlations being quite high, in the context of stereotyped STEM classes (Perez et al., 2019). Moreover, in stereotypical domains such as math and reading, the relations of intrinsic value to their competence belief were stronger than the relations of a combined usefulness–importance variable to competence beliefs among children (Wigfield and Eccles, 2020). Therefore, in this study, we focus on gender differences in intrinsic value in digital learning context. Moreover, Eccles-Parsons et al. (1983) posited that individuals' competence value-related beliefs are the most proximal psychological determinants of engagement in the chosen activities. Specifically, when children place high intrinsic value on an activity, they often become deeply engaged in it and can persist at it for a long time (Eccles, 2005). As concentrating and staying focused on a learning activity in digital learning setting during COVID might be particularly challenging due to the lack of the motivational regulation in digital learning setting (Fryer and Bovee, 2016), especially for groups that might be at risk in virtual classroom, we decided to test gender differences in this component of digital learning as well. In addition, perceived teacher support is included as a contextual factor important for learning.

The first research objective focuses on differences between boys and girls in these four components of digital learning—competence beliefs, intrinsic value, learning engagement, and perceived teacher support—while the second research objective addresses differences between adolescents with different gender role self-concept—masculine, feminine, androgynous, and undifferentiated—in those components of digital learning during pandemic-induced school closures. Interaction between two gender dimensions is also tested.

In line with studies that found clear dominance of boys over girls when it comes to competence beliefs in this domain among high school students and adolescents (Mumtaz, 2001; Broos and Roe, 2006; Meelissen and Drent, 2007), we expect higher competence beliefs among boys compared to girls. Regarding the intrinsic value of digital learning, there was no directed hypothesis posed due to inconsistent results yielded from previous studies on sex differences in values toward ICT and digital learning (e.g., Ong and Lai, 2006; Price, 2006; Cuadrado-García et al., 2010; Lu and Chiou, 2010). Based on studies reporting higher engagement with computers in education purposes in boys (e.g., Drabowicz, 2014), we expect higher learning engagement in boys compared to girls in digital learning setting during COVID. As ICTs are still a gender-stereotyped domain and perceived as a masculine field, we expect students who ascribe masculine characteristics to themselves to a high degree (masculine and androgynous individuals) to show the highest levels of both competence and intrinsic value beliefs as well as engagement within the digital learning context.

Regarding the perceived teacher support, aligning with the previous study on perceived teacher support (Vekiri, 2012), we expect insignificant differences between boys and girls in perceived teacher support during pandemic-induced digital learning. However, as the orientation toward social support and social relationships is a stereotypically feminine quality,

we expected the highest levels of perceived teacher support in feminine and androgynous students. For undifferentiated adolescents, the lowest levels of competence beliefs, perceived values, engagement, and perceived teacher support during digital learning are expected compared to the other three types. As competence and value-related beliefs show a decline through school years (Jacobs et al., 2002; Cimpian, 2017), as well as learning engagement (Fredricks et al., 2004) and perception of social support (Ryan et al., 1994), we controlled for age in all analyses.

METHOD

Participants, Procedure, and Context of Data Collection

The data was collected in April 2020 in Vienna, Austria, as part of a larger project investigating learning under the conditions of the COVID-19. For the purposes of this study, a subsample consisting of boys and girls only was selected, excluding 0.6% of students that declared their gender as diversified. In total, the selected study sample comprised 19,190 secondary school students (61.9% girls, $M_{\text{age}} = 14.55$, $SD_{\text{age}} = 2.49$, age range 10–21) from all types of Austrian secondary schools (general secondary school, technical and vocational secondary schools, and apprenticeship). Data was collected with online questionnaires. To recruit participants, we distributed the link to the online questionnaire by contacting manifold stakeholders such as school boards, educational networks, and school principals with the help of the Austrian Federal Ministry for Education, Science, and Research. Participation was voluntarily and anonymous. Only students who gave active consent were included in the dataset. In Austria, schools stopped providing onsite learning on March 16. Throughout the entire data collection period, schools were obliged to ensure that education continued in the form of digital learning. Teachers and schools were given autonomy in the organization and design of remote instruction. While there was no on-site teaching, schools remained open to provide childcare to individual students where necessary (Federal Ministry of Education, 2020b). However, this option was taken up by ~2% of the student population only (Federal Ministry of Education, 2020a).

Measures

Due to the novelty of the COVID-19 situation, it was necessary to adapt existing scales or develop new items for scales that served as dependent variables in order to address the current circumstances. To ensure the content validity of the adapted or newly formulated items, we revised them based on expert judgments. The measures were then piloted with cognitive testing among adolescents of different ages. For details on the measures and the complete set of items, see Schober et al. (2020). All items were rated on a five-point scale ranging from 1 (strongly agree) to 5 (strongly disagree). Participants were instructed to answer the items with respect to their current digital learning activities. Analyses were conducted with recoded items so that higher values reflected higher agreement with the statements.

Competence Beliefs

To assess competence beliefs in digital learning, three newly developed items were used (sample item: “Overall, I am managing e-learning pretty well”), $\alpha = 0.711$.

Intrinsic Value

Intrinsic value was assessed with three items adapted from the Scales for the Measurement of Motivational Regulation for Learning in University Students (SMR-LS; Thomas et al., 2018; sample item: “Currently, I really enjoy studying and working for school”), $\alpha = 0.916$.

Learning Engagement

Learning engagement was measured with three slightly adapted items from the engagement subscale of the EPOCH Measure (Kern et al., 2016; sample item: “Currently when I am working on my schoolwork, I get completely absorbed in what I am doing”), $\alpha = 0.732$.

Perceived Teacher Support

To measure the social component of digital learning, three additional items concerning interaction with teachers were used (sample item: “Currently, my teachers help me with e-learning”), $\alpha = 0.745$.

Gender Role Self-Concept

To assess self-perceived femininity and masculinity, positive traits from the Inventory for Measuring Adolescents' Gender Role Self-Concept (GRI-JUG) were used (Krahé et al., 2007). Participants were presented with five masculine attributes (humorous, courageous, sporty, companionable, and strong; $\alpha = 0.676$) and five feminine attributes (emotional, romantic, industrious, sympathetic, and empathic; $\alpha = 0.651$) and were asked to rate to what extent each attribute is characteristic of them. Separate scores were calculated for masculinity and femininity. The median split procedure adopted by Spence et al. (1975) and Bem (1977) was used to determine the four types of gender role self-concepts. Participants were classified into a 2×2 table according to whether they fell above or below the median score on the masculinity and femininity scales. Scores falling exactly on the median were classified as “high” scores (Carver

et al., 2013). In the present sample, the median masculinity score was 4.2 and the median femininity score was 4.0.

RESULTS

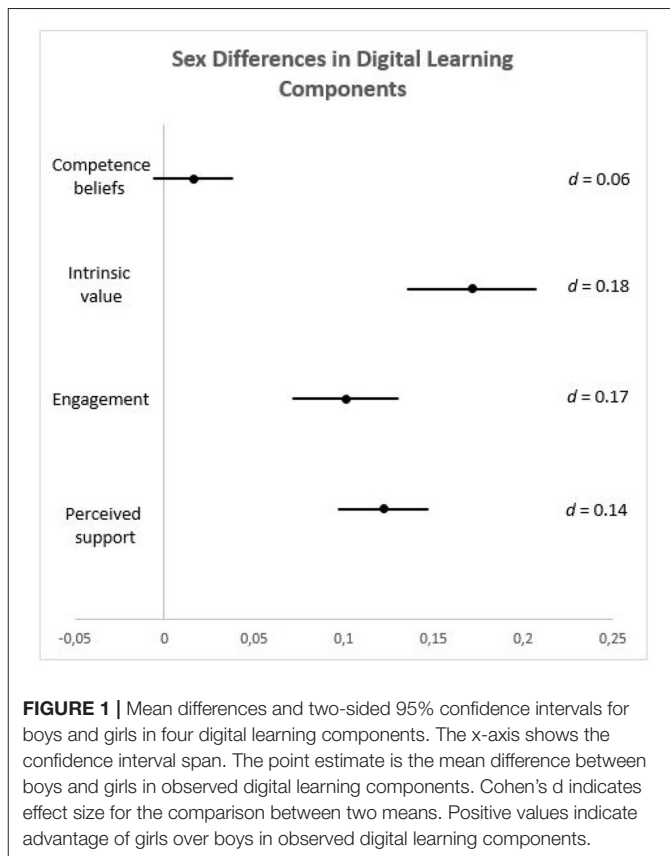
In order to examine differences in digital learning components among adolescents, four separate analyses of covariance (ANCOVAs) were conducted with sex (male/female) and gender role self-concept (androgynous/masculine/feminine/undifferentiated) as between-subject factors and age as a covariate. The mean scores for digital learning competence beliefs, intrinsic value, engagement, and perceived support in digital learning served as the dependent variables. Higher values reflect higher scores on these observed digital learning components. When interpreting the results, we focused on the effect sizes of the group differences alongside statistical significance, following Cohen's (1988) recommendations, with values around 0.10 representing small effects, values around 0.30 representing medium effects, and values > 0.50 representing large effects. Means and standard deviations for all dependent variables by sex and gender role self-concept are presented in **Table 1**. Effect sizes and confidence intervals for main effects of gender dimensions on four digital learning components are presented in **Figure 1** (biological sex) and **Figure 2** (gender role self-concept).

Competence Beliefs in Digital Learning

The results showed a statistically significant effect of age, $F_{(1,19157)} = 67.75, p = 0.000, \eta^2_p = 0.004$, indicating a negative relationship between age and competence beliefs in digital learning, $r_{(19,181)} = -0.063, p = 0.000$. The main effect of sex was not significant, $F_{(1,19157)} = 2.06, p = 0.151, \eta^2_p = 0.000$. There was a statistically significant main effect of gender role self-concept after controlling for adolescents' age, $F_{(3,19157)} = 147.07, p = 0.000, \eta^2_p = 0.023$. A Bonferroni *post hoc* test showed that androgynous adolescents reported significantly higher competence beliefs in digital learning than masculine, feminine, and undifferentiated adolescents. Feminine adolescents exhibited a slightly higher level of competence beliefs in digital learning compared to masculine adolescents. Undifferentiated adolescents had statistically significantly lower levels of competence beliefs

TABLE 1 | Means and standard deviations of digital learning components by gender role self-concept and sex.

Gender role self-concept	Sex	N	Competence beliefs		Intrinsic value		Learning engagement		Perceived teacher support	
			M	SD	M	SD	M	SD	M	SD
Androgynous	Boys	2,175	4.22	0.751	2.95	1.184	3.40	0.945	4.20	0.841
	Girls	3,878	4.29	0.648	3.21	1.149	3.53	0.890	4.32	0.734
Masculine	Boys	2,089	4.11	0.713	2.59	1.074	3.06	0.920	4.06	0.843
	Girls	1,486	4.10	0.697	2.84	1.153	3.20	0.919	4.15	0.797
Feminine	Boys	825	4.13	0.706	2.88	1.129	3.27	0.960	4.04	0.835
	Girls	3,771	4.12	0.661	2.88	1.133	3.31	0.885	4.12	0.765
Undifferentiated	Boys	2,217	3.98	0.724	2.52	1.074	2.95	0.908	3.92	0.850
	Girls	2,733	3.96	0.704	2.61	1.109	3.05	0.906	4.01	0.788



in digital learning than adolescents with other gender role self-concepts. The interaction between gender role self-concept and sex was statistically significant, $F_{(3,19157)} = 5.60$, $p = 0.001$, $\eta^2_p = 0.001$, indicating higher levels of competence beliefs in digital learning among androgynous girls compared to androgynous boys and all other groups. Feminine boys and girls, masculine boys and girls, and undifferentiated boys and girls achieved similar scores.

Intrinsic Value

The results showed a statistically significant effect of age, $F_{(1,19157)} = 209.64$, $p = 0.000$, $\eta^2_p = 0.011$, indicating a negative relationship between age and intrinsic value, $r_{(19,179)} = -0.094$, $p = 0.000$. The main effect of sex was statistically significant after controlling for adolescents' age, $F_{(1,19157)} = 89.50$, $p = 0.000$, $\eta^2_p = 0.005$, with girls reporting higher intrinsic value of digital learning compared to boys. There was also a statistically significant main effect of gender role self-concept after controlling for adolescents' age, $F_{(3,19157)} = 194.91$, $p = 0.000$, $\eta^2_p = 0.030$. A Bonferroni *post hoc* test showed that androgynous adolescents reported significantly higher intrinsic value than masculine, feminine, and undifferentiated adolescents. Feminine adolescents showed higher levels of intrinsic value compared to masculine adolescents. Undifferentiated adolescents had statistically significantly lower intrinsic value than adolescents with other gender role self-concepts. The interaction between gender role self-concept and sex was also statistically significant,

$F_{(3,19157)} = 12.04$, $p = 0.000$, $\eta^2_p = 0.002$, indicating higher levels of intrinsic value in androgynous girls compared to androgynous boys and all other groups, as well as in masculine girls compared to masculine boys. Feminine girls and boys achieved similar results, as did undifferentiated boys and girls.

Learning Engagement

The results showed a statistically non-significant effect of age, $F_{(1,19157)} = 0.46$, $p = 0.500$, $\eta^2_p = 0.000$. The main effect of sex was statistically significant, $F_{(1,19157)} = 47.21$, $p = 0.000$, $\eta^2_p = 0.002$, with girls scoring higher on learning engagement compared to boys. The main effect of gender role self-concept after controlling for adolescents' age was also statistically significant, $F_{(3,19157)} = 247.44$, $p = 0.000$, $\eta^2_p = 0.037$. A Bonferroni *post hoc* test showed that androgynous adolescents reported statistically significantly higher levels of learning engagement than masculine, feminine, and undifferentiated adolescents. Feminine adolescents showed a higher level of learning engagement compared to masculine adolescents. Undifferentiated adolescents had lower levels of learning engagement than adolescents with other gender role self-concepts. The interaction between gender role self-concept and sex was not statistically significant, $F_{(3,19157)} = 1.72$, $p = 0.161$, $\eta^2_p = 0.000$.

Perceived Teacher Support in Digital Learning

The results showed a statistically significant effect of age, $F_{(1,19157)} = 602.61$, $p = 0.000$, $\eta^2_p = 0.030$, indicating a negative relationship between age and perceived teacher support in digital learning, $r_{(19,181)} = -0.170$, $p = 0.000$. The main effect of sex was also statistically significant after controlling for adolescents' age, $F_{(1,19157)} = 92.47$, $p = 0.000$, $\eta^2_p = 0.005$, with girls reporting higher perceived teacher support in digital learning compared to boys. There was also a statistically significant main effect of gender role self-concept after controlling for adolescents' age, $F_{(3,19157)} = 110.70$, $p = 0.000$, $\eta^2_p = 0.017$. A Bonferroni *post hoc* test showed that androgynous adolescents reported statistically significantly higher levels of perceived teacher support in digital learning than masculine, feminine, and undifferentiated adolescents. Feminine adolescents reported higher perceived teacher support in digital learning compared to masculine adolescents. Undifferentiated adolescents reported statistically significantly lower perceived teacher support in digital learning than adolescents with other gender role self-concepts. The interaction between gender role self-concept and sex was not statistically significant, $F_{(3,19157)} = 0.76$, $p = 0.515$.

DISCUSSION

The main goal of this study was to investigate the gender differences in a digital learning context during a period of pandemic-induced school closures, including both biological sex and gender role self-concept in tackling the differences in this stereotyped domain. The study encompassed four components of digital learning identified as not only important for learning success but also susceptible for stereotyped gender gap:

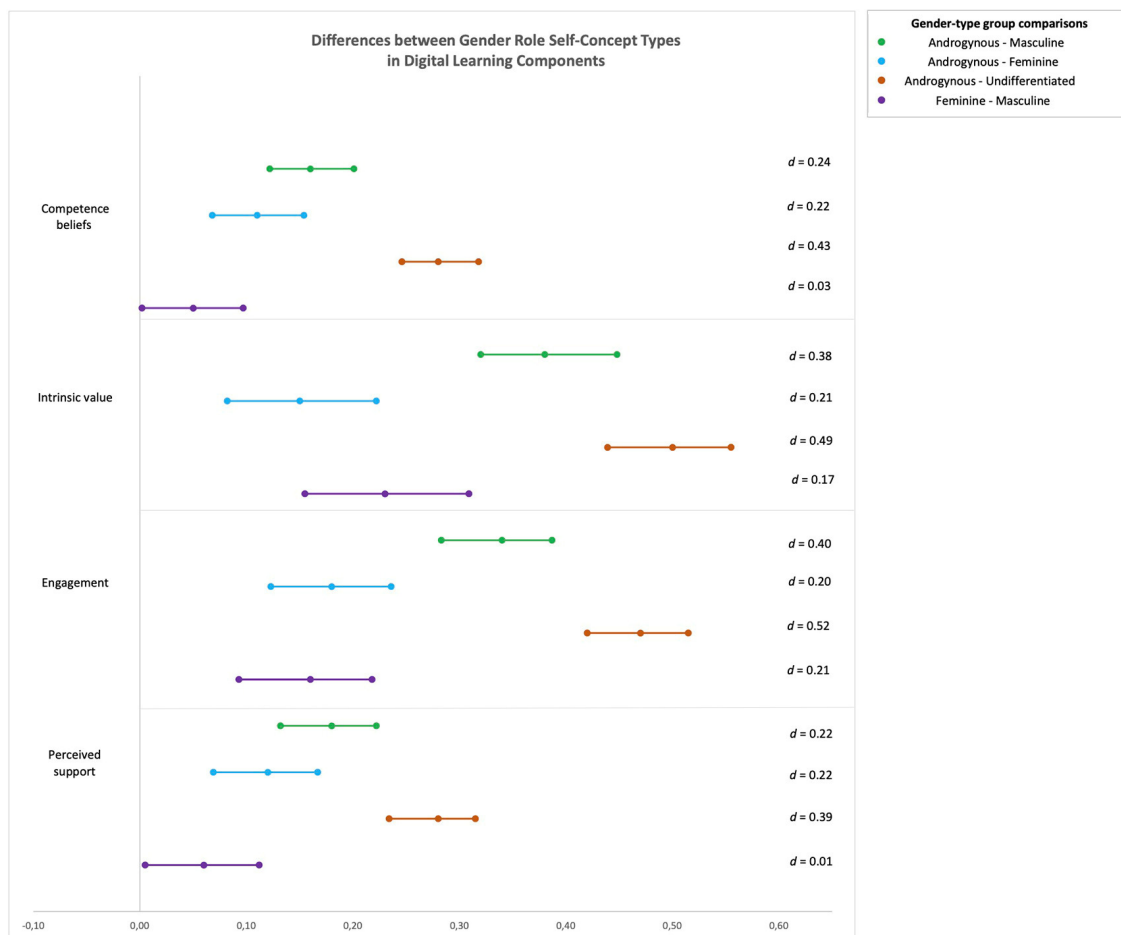


FIGURE 2 | Mean differences and two-sided 95% confidence intervals for the gender role self-concept group comparisons in four digital learning components. The x-axis shows the confidence interval span. The point estimate is the mean difference between gender role self-concept types (gender-type groups) in observed digital learning components. Cohen's d indicates effect size for the comparison between two means. Positive values indicate advantage of androgynous over masculine, feminine, and undifferentiated adolescents in observed digital learning components, and advantage of feminine over masculine adolescents in observed digital learning components.

competence beliefs, intrinsic value, engagement, and perceived teacher support. The first objective of the study focused on sex differences in the examined components of digital learning.

Our results showed no differences between boys and girls in competence beliefs in digital learning, indicating that girls and boys had equal levels of perceived abilities in digital learning. Although previous studies have revealed higher levels of competence beliefs related to computers and technologies in general among adolescent boys (see Vekiri and Chronaki, 2008), our results showed equality between boys and girls with respect to managing digital learning, using technologies and technical equipment to complete their school tasks and comprehension of tasks performed in a digital learning format. This finding is inconsistent with our assumption, but it can be explained with girls' general higher academic competence beliefs in adolescence (Britner and Pajares, 2001), which potentially translated into digital learning setting leveling thus the sex differences in this context. On the other hand, while studies have continuously showed higher engagement with computers in general among

boys (Colley and Comber, 2003; Drabowicz, 2014), girls exhibited higher digital learning engagement in our study. This is not surprising given girls' higher levels of engagement in school-related tasks in general (Lam et al., 2012). It has been shown that even though boys are perceived as more skilled than girls (Bian et al., 2017), girls are more engaged with learning activities and more study oriented (Van Houtte, 2004). Thus, it might be that girls transferred their established learning practices into new learning context when schools switched to digital learning. This seems especially plausible given the unpreparedness of schools and teachers for this new teaching context (Hodges et al., 2020), which could have caused them to apply usual didactic techniques from face-to-face teaching, without fully adapting to the digital context. Thus, stereotypical aspects of digital context potentially were not pronounced enough to threaten girls' engagement. In differently organized digital learning setting where typically masculine technical skills would be more required, results might show stereotypical results of boys' dominance in engagement with technology even in a learning context.

Our results showed the same non-stereotypical pattern for intrinsic value of digital learning, which corresponds to the results of some previous studies finding higher intrinsic motivation in digital learning contexts among girls (e.g., McSparran and Young, 2001; Price, 2006). Various studies have shown that boys are less motivated than girls and have less positive attitudes toward school in general (Cox, 2000; Francis, 2000), which potentially overflowed into digital learning context during this pandemic. This is especially plausible given that data was collected soon after schools in Austria switched to online learning. Results might be different now after a year of digital learning practice when both boys and girls are more habituated to it.

Regarding the contextual factor in learning, our results have shown higher perceived teacher support among girls than among boys. While previous studies on ICT did not find differences between boys and girls in perceived teacher expectations and support (Vekiri, 2010), this finding is not surprising given the stronger orientation toward social relationships and social support in the feminine gender role associated with girls compared to the masculine gender role associated with boys in Western societies (Helgeson, 1994; Korlat et al., 2021). In line with gender stereotypes, previous studies showed that girls rely more upon social support, especially in difficult or stressful situations (Helsen et al., 2000; Tamres et al., 2002), which might have been the case for digital learning during COVID-19. In addition, it has been shown that girls value student-teacher interaction more than boys do (e.g., Frymier and Houser, 2000). Thus, girls might be more proactive than boys in reaching out to teachers, thus establishing better relationships with them. On the other hand, teachers might provide more support to girls due to stereotypes about ICT and girls' potential disadvantages in the virtual classroom. Learning heavily relies on interactions between students and teachers (Taylor et al., 2007), so the potentially lower social support perceived by boys could affect their learning processes, particularly in light of the fact that the digital context in pandemic-induced learning might require more active interaction with the teacher than in-person instruction.

Taken together, our results challenge the notion of girls' potential disadvantages in the virtual classroom and reveal their relatively higher levels of perceived social support from teachers, intrinsic value, and engagement for digital learning. This calls attention to the challenges boys might face in the digital learning context, which could potentially intensify boys' existing underperformance in terms of overall academic achievement (Duckworth and Seligman, 2006; Hartley and Sutton, 2013). It is important to note that the effect sizes of the sex differences found in our study are small (Cohen's d ranging from 0.14 to 0.18), supporting the gender similarity hypothesis (Hyde, 2005), according to which gender differences on most psychological variables are small or close to zero. Nevertheless, boys' potential disadvantages regarding interaction with teachers, intrinsic value, and learning engagement during the pandemic-induced period of mandatory digital learning should not be easily discarded. Given the possibility that learning during pandemic might be organized in a way that resembles face-to-face learning—where boys lack

engagement and study-oriented culture (Van Houtte, 2004)—but in a distance form when students are forced to organize their learning autonomously without external regulation as in face-to-face learning (Huber et al., 2020), schooling during COVID could create an even higher risk for boys' academic achievement compared to pre-pandemic conditions. Moreover, boys' higher engagement with computers for entertainment purposes such as video games (Terlecki et al., 2011; Drabowicz, 2014) might have a negative influence for their self-regulated learning, posing great challenge to their focus and learning process in this context. Hence, schools and teachers should take into account all potential threats to both boys' and girls' learning process when organizing teaching in digital context during pandemic.

As ICTs are still a gender-stereotyped domain and perceived as a masculine field, it could be that gender differences in digital learning map onto students' gender role self-concept rather than their biological sex. Thus, the second objective of our study was to investigate differences between boys and girls with different gender role self-concepts in the studied components of digital learning during the pandemic-induced school closures. As expected, feminine adolescents reported higher levels of perceived social support than masculine and undifferentiated adolescents. This finding supports the notion of the compatibility between gender roles and gendered activities proposed by Eccles-Parsons et al. (1983) and Eccles (2009), as social support and social relationships represent the core of stereotypical femininity. Surprisingly, and contrary to our expectations, femininity was a contributing factor to higher levels of *stereotypically masculine* components of digital learning as well: feminine students exhibited higher levels of competence beliefs, intrinsic value, and engagement in digital learning compared to masculine and undifferentiated students. One explanation for this could be the higher relevance of femininity compared to masculinity for adolescents in the school context. Studies have found stronger school-related self-esteem and stronger feelings of belonging at school among feminine adolescents (Skinner et al., 2019). Moreover, feminine students are often more liked by teachers (Heyder and Kessels, 2013), which, alongside higher perceived teacher support, could contribute to higher intrinsic value and engagement in digital learning in girls, even in the digital context. However, the effect sizes for the differences between adolescents with feminine and masculine gender role self-concepts on all variables were small or close to zero (Cohen's d ranging from 0.01 for perceived support to 0.21 for learning engagement). Importantly, our results showed clear advantages of androgyny over both femininity and masculinity for digital learning with medium to large effect sizes, indicating the higher value of possessing both feminine and masculine characteristics than one sort only. Although Eccles (2009) assumed educational benefits in case of fitness between the stereotypicality of a task and one's gender role self-concept, this finding is not surprising given the broader repertoire of traits and behaviors (e.g., Pauletti et al., 2017) in androgynous individuals compared to others. This finding confirms better coping in different life situations related to androgyny suggested by Bem (1981), applied to altered learning setting in a pandemic era. Interestingly, it seems

that girls with androgynous characteristics have the clearest advantage over boys and girls with different gender role self-concept in competence and value-related beliefs regarding digital learning. As both ability and value beliefs are important for learning achievement (Wigfield and Eccles, 2000), androgynous girls might benefit the most from the pandemic-induced digital learning situation. Similarly, masculine girls showed higher levels of intrinsic value in the digital learning context compared to masculine boys. This is in line with the general advantage of girls over boys found in this study, however only with the small magnitude. As expected, undifferentiated adolescents achieved lower scores in all digital learning components under study, due to a lack of beneficial attributes and behaviors for coping.

In line with previous studies showing a decline in competence and value-related beliefs throughout adolescence (Jacobs et al., 2002; Cimpian, 2017), our results showed lower competence beliefs and intrinsic value for digital learning with increasing age. One reason for that might be an over-optimistic assessment in young children about their competencies in different areas and consequent high placed value (see Cimpian, 2017 for discussion). In addition, scholars argue that learning becomes more and more decontextualized and performance-oriented in adolescence, which undermines intrinsic motivation (Gnambs and Hanfstingl, 2016). At the same time, adolescence is a period where social relations and peers increase in importance (Simons-Morton and Chen, 2009; LaFontana and Cillessen, 2010), which might take adolescents' focus off learning. Accordingly, younger students were found to report higher perceived teacher support in this study. While the effect sizes are very small, it could be that teachers provide more assistance to younger students in digital learning, taking into account their lower experience with ICT and potentially longer adaptation period to this new learning setting. As the results indicate older students, along with boys, might particularly struggle with digital learning, teachers and schools should offer more support to them and pay particular attention to their management of school-related tasks in this new learning context. In addition, developing curricular activities and a virtual classroom environment that enhance both feminine and masculine traits and behaviors in both boys and girls may enhance their digital learning in the COVID-19 era.

Limitations and Future Directions

While this study has several strengths, including a large sample size, some limitations must be considered. First, even though pandemic-induced school closure provides a good opportunity to

investigate digital learning in a large sample of students, schools employed different digital platforms and teaching methods (e.g., synchronous and asynchronous) to support their teaching during the school closures. Future studies should investigate the role of gender in terms of both biological sex and gender role self-concept in digital learning settings with more uniform teaching and learning practices. Second, the data was collected online, which led to a self-selected sample. Third, future studies should include other value components (utility, importance, and cost) of the expectancy-value model, other contextual variables such as parental beliefs, and variables regarding the digital learning environment such as access to ICT. Finally, this study only takes into account positive aspects of gender role self-concept. Future studies should include both positive and negative aspects in order to more fully investigate the role of gender and stereotyped components of digital learning.

DATA AVAILABILITY STATEMENT

The datasets presented in this study can be found in online repositories. The names of the repository/repositories and accession number(s) can be found at: <https://doi.org/10.11587/VRQL3B>.

ETHICS STATEMENT

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Written informed consent for participation was not provided by the participants' legal guardians/next of kin because data was collected online due to circumstances of the COVID-19 and only consent from students was collected. Only students who gave active consent were included in the data set.

AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

FUNDING

The present study has been funded by the Vienna Science and Technology Fund (WWTF), the MEGA Bildungstiftung, and the City of Vienna through project COV20-025.

REFERENCES

- Adamus, T., Kerres, M., Getto, B., and Engelhardt, N. (2009). "Gender and E-tutoring – a concept for gender sensitive E-tutor training programs," in *5th European Symposium on Gender & ICT Digital Cultures: Participation – Empowerment – Diversity* (University of Bremen: Center for Gender Studies).
- Ashong, C. Y., and Commander, N. E. (2012). Ethnicity, gender, and perceptions of online learning in higher education. *J. Online Teach. Educ.* 8:98.
- Athenstaedt, U. (2002). Gender role self-concept, gender role attitudes and the participation in gender-typed vocational and leisure sport courses. *Psychol. Beiträge* 44, 585–595.
- Bem, S. L. (1977). On the utility of alternative procedures for assessing psychological androgyny. *J. Consult. Clin. Psychol.* 45, 196–205. doi: 10.1037/0022-006X.45.2.196
- Bem, S. L. (1981). Gender schema theory: a cognitive account of sex typing. *Psychol. Rev.* 88, 354–364. doi: 10.1037/0033-295X.88.4.354
- Bian, L., Leslie, S.-J., and Cimpian, A. (2017). Gender stereotypes about intellectual ability emerge early and influence children's interests. *Science* 355, 389–391. doi: 10.1126/science.aah6524
- Blakemore, J. E. O., and Centers, R. E. (2005). Characteristics of boys' and girls' toys. *Sex Roles* 53, 619–633. doi: 10.1007/s11199-005-7729-0

- Britner, S. L., and Pajares, F. (2001). Self-efficacy beliefs, motivation, race, and gender in middle school science. *J. Women Minor. Sci. Eng.* 7, 271–285. doi: 10.1615/JWomenMinorSciEng.v7.i4.10
- Broos, A., and Roe, K. (2006). The digital divide in the playstation generation: self-efficacy, locus of control and ICT adoption among adolescents. *Poetics* 34, 306–317. doi: 10.1016/j.poetic.2006.05.002
- Broos, A. R. (2005). Gender and information and communication technologies (ICT) anxiety: male self-assurance and female hesitation. *Cyber Psychol. Behav.* 8, 21–32. doi: 10.1089/cpb.2005.8.21
- Carver, L. F., Vafaei, A., Guerra, R., Freire, A., and Phillips, S. P. (2013). Gender differences: examination of the 12-item Bem sex role inventory (BSRI-12) in an older Brazilian population. *PLoS ONE* 8:e76356. doi: 10.1371/journal.pone.0076356
- Chalabaev, A., Sarrazin, P., Trouilloud, D., and Jussim, L. (2009). Can sex-undifferentiated teacher expectations mask an influence of sex stereotypes? Alternative forms of sex bias in teacher expectations. *J. Appl. Soc. Psychol.* 39, 2469–2498. doi: 10.1111/j.1559-1816.2009.00534.x
- Charles, M., and Bradley, K. (2009). Indulging our gendered selves? sex segregation by field of study in 44 countries. *Am. J. Sociol.* 114:924–976. doi: 10.1086/595942
- Chow, A., Eccles, J. S., and Salmela-Aro, K. (2012). Task value profiles across subjects and aspirations to physical and IT-related sciences in the United States and Finland. *Dev. Psychol.* 48, 1612–1628. doi: 10.1037/a0030194
- Cimpian, A. (2017). “Early reasoning about competence is not irrationally optimistic, nor does it stem from inadequate cognitive representations,” in *Handbook of Competence and Motivation: Theory and Application*, 2nd Edn., eds A. Elliott, C. S. Dweck, and D. Yeager (New York, NY: Guilford), 387–407.
- Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences*, 2nd Edn. Hillsdale, NJ: Lawrence Erlbaum Associates Publishers.
- Colley, A., and Comber, C. (2003). Age and gender differences in computer use and attitudes among secondary school students: what has changed? *Educ. Res.* 45, 155–165. doi: 10.1080/0013188032000103235
- Cooper, J. (2006). The digital divide: the special case of gender. *J. Comp. Assist. Learn.* 22, 320–334. doi: 10.1111/j.1365-2729.2006.00185.x
- Cox, T. (2000). “Pupils’ perspectives on their education,” in *Combating Educational Disadvantage. Meeting the Needs of Vulnerable Children*. ed T. Cox (London: Falmer Press), 136–155.
- Crombie, G., Abarbanel, T., and Trinneer, A. (2002). All-female classes in high school computer science: positive effects in three years of data. *J. Educ. Comp. Res.* 27, 385–409. doi: 10.2190/VRD4-69AF-WPQ6-P734
- Cuadrado-García, M., Ruiz-Molina, M. E., and Montoro-Pons, J. D. (2010). Are there gender differences in e-learning use and assessment? Evidence from an interuniversity online project in Europe. *Proc. Soc. Behav. Sci.* 2, 367–371. doi: 10.1016/j.sbspro.2010.03.027
- De Wit, D., Karioja, K., and Rye, B. (2010). Student perceptions of diminished teacher and classmate support following the transition to high school: are they related to declining attendance? *School Effect. School Improve.* 21, 451–472. doi: 10.1080/09243453.2010.532010
- Demaray, M. K., Malecki, C. K., Davidson, L. M., Hodgson, K. K., and Rebus, P. J. (2005). The relationship between social support and student adjustment: a longitudinal analysis. *Psychol. Schools* 42, 691–706. doi: 10.1002/pits.20120
- Drabowicz, T. (2014). Gender and digital usage inequality among adolescents: a comparative study of 39 countries. *Comput. Educ.* 74, 98–111. doi: 10.1016/j.compedu.2014.01.016
- Duckworth, A. L., and Seligman, M. E. P. (2006). Self-discipline gives girls the edge: gender in self-discipline, grades, and achievement test scores. *J. Educ. Psychol.* 98, 198–208. doi: 10.1037/0022-0663.98.1.198
- Durndell, A., and Haag, Z. (2002). Computer self-efficacy, computer anxiety, attitudes towards the internet and reported experience with the internet, by gender, in an East European sample. *Comput. Human Behav.* 18, 521–535. doi: 10.1016/S0747-5632(02)00006-7
- Eccles, J. (2011). Gendered educational and occupational choices: applying the Eccles et al. model of achievement-related choices. *Int. J. Behav. Dev.* 35, 195–201. doi: 10.1177/0165025411398185
- Eccles, J. S. (1994). Understanding women’s educational and occupational choices. *Psychol. Women Q.* 18, 585–609. doi: 10.1111/j.1471-6402.1994.tb01049.x
- Eccles, J. S. (2005). “Subjective task values and the Eccles et al. model of achievement related choices,” in *Handbook of Competence and Motivation*. eds A. J. Elliot and C. S. Dweck (New York, NY: Guilford), 105–121.
- Eccles, J. S. (2007). “Where are all the women? Gender differences in participation in physical science and engineering,” in *Why Aren’t More Women in Science? Top Researchers Debate the Evidence*, eds S. J. Ceci, and W. M. Williams (Washington, DC: American Psychological Association), 199–210.
- Eccles, J. S. (2009). Who am I and what am I going to do with my life? Personal and collective identities as motivators of action. *Educ. Psychol.* 44, 78–89. doi: 10.1080/00461520902832368
- Eccles, J. S., and Harold, R. D. (1991). Gender differences in sport involvement: applying the Eccles’ expectancy-value model. *J. Appl. Sport Psychol.* 3, 7–35. doi: 10.1080/10413209108406432
- Eccles, J. S., Wigfield, A., Harold, R., and Blumenfeld, P. B. (1993). Age and gender differences in children’s self- and task perceptions during elementary school. *Child Dev.* 64, 830–847. doi: 10.2307/1131221
- Eccles-Parsons, J. S., Adler, T. F., Futterman, R., Goff, S. B., Kaczala, C. M., Meece, J. L., et al. (1983). “Expectancies, values, and academic behaviors,” in *Achievement and Achievement Motivation*. ed J. T. Spence (W. H. Freeman).
- European Commission (2018). *Study on Supporting School Innovation Across Europe*. Final report. Luxembourg: Publications Office. doi: 10.2766/466312
- Federal Ministry of Education (2020a). *BMBWF: Mehr als Sechsmal so Viele Kinder in Schulischer Betreuung als vor Ostern*. Retrieved from: <https://www.bmbwf.gv.at/Ministerium/Presse/20200423.html> (accessed February 24, 2021).
- Federal Ministry of Education (2020b). *Coronavirus (COVID-19)*. Retrieved from: <https://www.bmbwf.gv.at/Ministerium/Informationspflicht/corona.html> (accessed February 24, 2021).
- Francis, B. (2000). *Boys, Girls and Achievement. Addressing the Classroom Issues*. London; New York, NY: Routledge/Falmer.
- Fredricks, J. A., Blumenfeld, P. C., and Paris, A. H. (2004). School engagement: potential of the concept, state of the evidence. *Rev. Educ. Res.* 74, 59–109. doi: 10.3102/00346543074001059
- Fryer, L. K., and Bovee, H. N. (2016). Supporting students’ motivation for e-learning: teachers matter on and offline. *Internet Higher Educ.* 30, 21–29. doi: 10.1016/j.iheduc.2016.03.003
- Frymier, A. B. and Houser, M. L. (2000). The teacher student relationship as an interpersonal relationship. *Commun. Educ.* 49, 207–219. doi: 10.1080/03634520009379209
- Gnamb, T., and Hanfstingl, B. (2016). The decline of academic motivation during adolescence: an accelerated longitudinal cohort analysis on the effect of psychological need satisfaction. *Educ. Psychol.* 36, 1698–1712. doi: 10.1080/01443410.2015.1113236
- Hartley, B. L., and Sutton, R. M. (2013). A stereotype threat account of boys’ academic underachievement. *Child Dev.* 84, 1716–1733. doi: 10.1111/cdev.12079
- Helgeson, V. S. (1994). Relation of agency and communion to well-being: evidence and potential explanations. *Psychol. Bull.* 116, 412–428. doi: 10.1037/0033-2909.116.3.412
- Helsen, M., Vollebergh, W., and Meeus, W. (2000). Social support from parents and friends and emotional problems in adolescence. *J. Youth Adolesc.* 29, 319–335. doi: 10.1023/A:1005147708827
- Herbert, J., and Stipek, D. (2005). The emergence of gender differences in children’s perceptions of their academic competence. *J. Appl. Dev. Psychol.* 26, 276–295. doi: 10.1016/j.appdev.2005.02.007
- Heyder, A., and Kessels, U. (2013). Is school feminine? Implicit gender stereotyping of school as a predictor of academic achievement. *Sex Roles* 69, 605–617. doi: 10.1007/s11199-013-0309-9
- Hodges, C., Moore, S., Locker, B., Trust, T., and Bond, A. (2020). The difference between emergency remote teaching and online learning. *Educ. Rev.* Retrieved from: <https://er.educause.edu/articles/2020/3/the-difference-between-emergency-remote-teaching-and-online-learning> (accessed February 24, 2021).
- Huber, S. G., Günther, P. S., Schneider, N., Helm, C., Schwander, M., Schneider, J., et al. (2020). *COVID-19 und Aktuelle Herausforderungen in Schule und Bildung*. Münster: Waxmann. doi: 10.31244/9783830942160
- Hung, M. L., Chou, C., Chen, C. H., and Own, Z. Y. (2010). Learner readiness for online learning: scale development and student perceptions. *Comput. Educ.* 55, 1080–1090. doi: 10.1016/j.compedu.2010.05.004
- Hyde, J. S. (2005). The gender similarities hypothesis. *Am. Psychol.* 60, 581–592. doi: 10.1037/0003-066X.60.6.581

- IIEP-UNESCO (2020). *COVID-19 School Closures: Why Girls Are More at Risk*. Available online at: <http://www.iiep.unesco.org/en/covid-19-school-closures-why-girls-are-more-risk-13406> (accessed February 24, 2021).
- Jacobs, J. E., Lanza, S., Osgood, D. W., Eccles, J. S., and Wigfield, A. (2002). Changes in children's self-competence and values: gender and domain differences across grades one through twelve. *Child Dev.* 73, 509–527. doi: 10.1111/1467-8624.00421
- Kayany, J. M., and Yelsma, P. (2000). Displacement effects of online media in the socio-technical contexts of households. *J. Broadcast. Electron. Media* 44, 215–229. doi: 10.1207/s15506878jebem4402_4
- Kern, M. L., Benson, L., Steinberg, E. A., and Steinberg, L. (2016). The EPOCH measure of adolescent well-being. *Psychol. Assess.* 28, 586–597. doi: 10.1037/pas0000201
- Kessels, U., and Steinmayr, R. (2013). Macho-man in school: toward the role of gender role self-concepts and help seeking in school performance. *Learn. Individ. Differ.* 23, 234–240. doi: 10.1016/j.lindif.2012.09.013
- Kollmayer, M., Schultes, M.-T., Schober, B., Hodosi, T., and Spiel, C. (2018). Parents' judgments about the desirability of toys for their children: associations with gender role attitudes, gender-typing of toys, and demographics. *Sex Roles* 79, 329–341. doi: 10.1007/s11199-017-0882-4
- Korlat, S., Foerst, N. M., Schultes, M.-T., Schober, B., Spiel, C., and Kollmayer, M. (2021). Gender role identity and gender intensification: agency and communion in adolescents' spontaneous self-descriptions. *Eur. J. Dev. Psychol.* doi: 10.1080/17405629.2020.1865143
- Krahé, B., Berger, A., and Möller, I. (2007). Entwicklung und validierung eines inventars zur erfassung des geschlechtsrollen-selbstkonzepts im jugendalter [Development and Validation of an Inventory for Measuring Gender Role Self-Concept in Adolescence]. *Zeitschrift Sozialpsychol.* 38, 195–208. doi: 10.1024/0044-3514.38.3.195
- LaFontana, K. M., and Cillessen, A. H. N. (2010). Developmental changes in the priority of perceived status in childhood and adolescence. *Soc. Dev.* 19, 130–147. doi: 10.1111/j.1467-9507.2008.00522.x
- Lam, S. F., Jimerson, S., Kikas, E., Cefai, C., Veiga, F. H., Nelson, B., et al. (2012). Do girls and boys perceive themselves as equally engaged in school? The results of an international study from 12 countries. *J. School Psychol.* 50, 77–94. doi: 10.1016/j.jsp.2011.07.004
- Li, N., and Kirkup, G. (2007). Gender and cultural differences in Internet use: a study of China and the UK. *Comput. Educ.* 48, 301–317. doi: 10.1016/j.compedu.2005.01.007
- Lu, H., and Chiou, M. (2010). The impact of individual differences on e-learning system satisfaction: a contingency approach. *Brit. J. Educ. Technol.* 41, 307–323. doi: 10.1111/j.1467-8535.2009.00937.x
- Lupart, J. L., Cannon, E., and Telfer, J. A. (2004). Gender differences in adolescent academic achievement, interests, values and life-role expectations. *High Ability Stud.* 15, 25–42. doi: 10.1080/1359813042000225320
- Malecki, C. K., and Demaray, M. K. (2003). What type of support do they need? Investigating student adjustment as related to emotional, informational, appraisal, and instrumental support. *School Psychol. Q.* 18, 231–252. doi: 10.1521/scpq.18.3.231.22576
- Markstrom-Adams, C. (1989). Androgyny and its relation to adolescent psychosocial well-being: a review of the literature. *Sex Roles* 21, 325–340. doi: 10.1007/BF00289595
- McGeown, S., Goodwin, H., Henderson, N., and Wright, P. (2012). Gender differences in reading motivation: does sex or gender identity provide a better account? *J. Res. Read.* 35, 328–336. doi: 10.1111/j.1467-9817.2010.01481.x
- McSparran, M., and Young, S. (2001). Does gender matter in online learning? *Res. Learn. Technol.* 9, 3–15. doi: 10.1080/0968776010090202
- Meece, J. L., Glienke, B. B., and Burg, S. (2006). Gender and motivation. *J. Sch. Psychol.* 44, 351–373. doi: 10.1016/j.jsp.2006.04.004
- Meelissen, M. R. M., and Drent, M. (2007). Gender differences in computer attitudes: does the school matter? *Comput. Human Behav.* 24, 969–985. doi: 10.1016/j.chb.2007.03.001
- Moss-Racusin, C. A., Sanzari, C., Caluori, N., and Rabasco, H. (2018). Gender bias produces gender gaps in STEM engagement. *Sex Roles* 79, 651–670. doi: 10.1007/s11199-018-0902-z
- Mucherah, W. M. (2003). The influence of technology on the classroom climate of social studies classrooms: a multidimensional approach. *Learn. Environ. Res.* 6, 37–57. doi: 10.1023/A:1022903609290
- Mumtaz, S. (2001). Children's enjoyment and perception of computer use in the home and the school. *Comput. Educ.* 36, 347–362. doi: 10.1016/S0360-1315(01)00023-9
- Nefesh-Clarke, L., Orser, B., and Thomas, M. (2020). *COVID-19 Response Strategies, Addressing Digital Gender Divides*. Available online at: https://www.g20-insights.org/policy_briefs/covid-19-response-strategies-addressing-digital-gender-divides/ (accessed February 24, 2021).
- OECD (2001). *E-learning: The Partnership Challenge*. Paris: OECD Publishing. doi: 10.1787/9789264193161-en
- OECD (2020). *Education Responses to Covid-19: Embracing Digital Learning and Online Collaboration*. Retrieved from: https://read.oecd-ilibrary.org/view/?ref=120_120544-8ksud7oaj2&title=Education_responses_to_Covid-19_Embracing_digital_learning_and_online_collaboration (accessed February 24, 2021).
- Ong, C. S., and Lai, J. Y. (2006). Gender differences in perceptions and relationships among dominants of e-learning acceptance. *Comput. Human Behav.* 22, 816–829. doi: 10.1016/j.chb.2004.03.006
- Patrick, H., Ryan, A. M., and Kaplan, A. (2007). Early adolescents' perceptions of the classroom social environment, motivational beliefs, and engagement. *J. Educ. Psychol.* 99, 83–98. doi: 10.1037/0022-0663.99.1.83
- Pauletti, R. E., Menon, M., Cooper, P. J., Aults, C. D., and Perry, D. G. (2017). Psychological androgyny and children's mental health: a new look with new measures. *Sex Roles* 76, 705–718. doi: 10.1007/s11199-016-0627-9
- Perez, T., Wormington, S. V., Barger, M. M., Schwartz-Bloom, R. D., Lee, Y., and Linnenbrink-Garcia, L. (2019). Science expectancy, value, and cost profiles and their proximal and distal relations to undergraduate science, technology, engineering, and math persistence. *Sci. Educ.* 103, 264–286. doi: 10.1002/sce.21490
- Perkowski, J. (2013). The role of gender in distance learning: a meta-analytic review of gender differences in academic performance and self-efficacy in distance learning. *J. Educ. Technol. Syst.* 41, 267–278. doi: 10.2190/ET.41.3.e
- Price, L. (2006). Gender differences and similarities in online courses: challenging stereotypical views of women. *J. Comp. Assist. Learn.* 22, 349–359. doi: 10.1111/j.1365-2729.2006.00181.x
- Reddy, R., Rhodes, J. E., and Mulhall, P. (2003). The influence of teacher support on student adjustment in the middle school years: a latent growth curve study. *Dev. Psychopathol.* 15, 119–138. doi: 10.1017/S0954579403000075
- Ryan, R. M., Stiller, J. D., and Lynch, J. H. (1994). Representations of relationships to teachers, parents, and friends as predictors of academic motivation and self-esteem. *J. Early Adolesc.* 14, 226–249. doi: 10.1177/027243169401400207
- Schober, B., Lüftenegger, M., and Spiel, C. (2020). *Learning Conditions During COVID-19 Pupils*. AUSSDA.
- Schrenk, R. (2020). Distance learning mit moodle—aktuelles aus österreichs schulen. *GW Unterricht*. 158, 51–56. doi: 10.1553/gw-unterricht158s51
- Signorella, M. L., and Jamison, W. (1986). Masculinity, femininity, androgyny, and cognitive performance: a meta-analysis. *Psychol. Bull.* 100, 207–228. doi: 10.1037/0033-2909.100.2.207
- Simons-Morton, B., and Chen, R. (2009). Peer and parent influences on school engagement among early adolescents. *Youth Soc.* 41, 3–25. doi: 10.1177/0044118X09334861
- Simpkins, S. D., Fredricks, J. A., and Eccles, J. S. (2012). Charting the Eccles' expectancy-value model from mothers' beliefs in childhood to youths' activities in adolescence. *Dev. Psychol.* 48, 1019–1032. doi: 10.1037/a0027468
- Skinner, O. D., McHale, S. M., Wood, D., and Telfer, N. A. (2019). Gender-typed personality qualities and African American youth's school functioning. *J. Youth Adolesc.* 48, 680–691. doi: 10.1007/s10964-018-0919-1
- Spence, J. T., Helmreich, R., and Stapp, J. (1975). Ratings of self and peers on sex role attributes and their relation to self-esteem and conceptions of masculinity and femininity. *J. Pers. Soc. Psychol.* 32, 29–39. doi: 10.1037/h0076857
- Tamres, L. K., Janicki, D., and Helgeson, V. S. (2002). Sex differences in coping behavior: a meta-analytic review and an examination of relative coping. *Personal. Soc. Psychol. Rev.* 6, 2–30. doi: 10.1207/S15327957PSPR0601_1
- Taylor, A., Bailey, A., L., Cooper, P., Dwyer, C., Kramarae, C., et al. (2007). "Gender equity in communication skill," in *Handbook for Achieving Gender Equity Through Education*. ed S. Klein (New York, NY: Lawrence Erlbaum Associates), 281–303.
- Terlecki, M., Brown, J., Harner-Steciw, L., Irvin-Hannum, J., Marchetto-Ryan, N., Ruhl, L., et al. (2011). Sex differences and similarities in video game

- experience, preferences, and self-efficacy: implications for the gaming industry. *Curr. Psychol.* 30, 22–33. doi: 10.1007/s12144-010-9095-5
- Thomas, A. E., Müller, F. H., and Bieg, S. (2018). Entwicklung und validierung der skalen zur motivationalen regulation beim lernen im studium (SMR-LS) [Development and validation of scales for the measurement of motivational regulation for learning in university students (SMR-LS)]. *Diagnostica* 64, 145–155. doi: 10.1026/0012-1924/a000201
- UN (2020). *Education During COVID-19 and Beyond*. Available online at: https://www.un.org/development/desa/dspd/wp-content/uploads/sites/22/2020/08/sg_policy_brief_covid-19_and_education_august_2020.pdf (accessed February 24, 2021).
- UNICEF (2020). *Keeping the World's Children Learning Through COVID-19*. Available online at: <https://www.unicef.org/coronavirus/keeping-worlds-children-learning-through-covid-19> (accessed February 24, 2021).
- Van Grootel, S., Van Laar, C., Meeussen, L., Schmader, T., and Sczesny, S. (2018). Uncovering pluralistic ignorance to change men's communal self-descriptions, attitudes, and behavioral intentions. *Front. Psychol.* 9:1344. doi: 10.3389/fpsyg.2018.01344
- Van Houtte, M. (2004). Why boys achieve less at school than girls: The difference between boys' and girls' academic culture. *Educ. Stud.* 30, 159–173. doi: 10.1080/0305569032000159804
- Vekiri, I. (2010). Boys' and girls' ICT beliefs: do teachers matter? *Comput. Educ.* 55, 16–23. doi: 10.1016/j.compedu.2009.11.013
- Vekiri, I. (2012). Information science instruction and changes in girls' and boys' expectancy and value beliefs: in search of gender-equitable pedagogical practices. *Comput. Educ.* 64, 104–115.
- Vekiri, I. (2013). Information science instruction and changes in girls' and boy's expectancy and value beliefs: in search of gender-equitable pedagogical practices. *Comp. Educ.* 64, 104–115. doi: 10.1016/j.compedu.2013.01.011
- Vekiri, I., and Chronaki, A. (2008). Gender issues in technology use: perceived social support, computer self-efficacy and value beliefs, and computer use beyond school. *Comput. Educ.* 51, 1392–1404. doi: 10.1016/j.compedu.2008.01.003
- Volman, M., and van Eck, E. (2001). Gender equity and information technology in education: the second decade. *Rev. Educ. Res.* 71, 613–634. doi: 10.3102/00346543071004613
- Wahlmüller-Schiller, C. (2017). Bildung 4.0 – der Weg in die zukunft. *Elektrotech. Information.* 134, 382–385. doi: 10.1007/s00502-017-0527-x
- Watt, H. M. G., Shapka, J. D., Morris, Z. A., Durik, A. M., Keating, D. P., and Eccles, J. S. (2012). Gendered motivational processes affecting high school mathematics participation, educational aspirations, and career plans: a comparison of samples from Australia, Canada, and the United States. *Dev. Psychol.* 48, 1594–1611. doi: 10.1037/a0027838
- Wigfield, A., and Eccles, J. S. (2000). Expectancy-value theory of achievement motivation. *Contemp. Educ. Psychol.* 25, 68–81. doi: 10.1006/ceps.1999.1015
- Wigfield, A., and Eccles, J. S. (2020). 35 years of research on students' subjective task values and motivation: a look back and a look forward. *Adv. Motiv. Sci.* 7, 161–198. doi: 10.1016/bs.adms.2019.05.002
- Wolter, B. I., and Hannover, B. (2016). Gender role self-concept at school start and its impact on academic self-concept and performance in mathematics and reading. *Eur. J. Dev. Psychol.* 13, 681–703. doi: 10.1080/17405629.2016.1175343
- Wood, W., and Eagly, A. (2012). Biosocial construction of sex differences and similarities in behavior. *Adv. Exp. Soc. Psychol.* 46, 55–123. doi: 10.1016/B978-0-12-394281-4.00002-7
- Yates, S. J. (2001). Gender, language and CMC for education. *Learn. Instruct.* 11, 21–34. doi: 10.1016/S0959-4752(00)00012-8
- Young, B. J. (2000). Gender differences in student attitudes toward computers. *J. Res. Comput. Educ.* 33, 204–216. doi: 10.1080/08886504.2000.10782310

Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Abstract

Gender stereotypes set expectations in a society on what men and women could and should be like, what they could and should do and how successful they will be in a given role. These expectations are based on an assumed fit of women's communion in human-centered fields and supportive roles and men's agency in impersonal and tech-intensive fields and roles of power. With the goal of cognitive consistency and avoidance of incongruity between social expectations and self (Bem, 1981; Tajfel & Turner, 1986), individuals adopt stereotypical roles and behavior in their self-concept during early adolescence when preparation for approaching adult roles begins (Hill & Lynch, 1983). This has far-reaching consequences on boys and girls in different aspects of life – from mental health to educational engagement and career options. Therefore, the aim of the present dissertation was to examine 1) whether adolescents still gender self-stereotype themselves nowadays and whether their gendered identity intensifies during early adolescence, assessing their self-stereotyping with a more valid method than previous studies, and 2) how self-stereotyping affects their psychological functioning in terms of occupational aspirations, school-related well-being and digital learning especially relevant during the COVID-19 pandemic. Study 1 showed stereotypical but small gender differences in agency and communion, and no evidence for gender intensification. Moreover, significant gender differences were found in only 17% of the named attributes. The results thus indicate greater gender similarities than gender differences in adolescents' self-descriptions. Study 2 showed significant gender differences in gender typicality of occupational aspirations, with boys expressing a clear preference for typically masculine occupations and girls for typically feminine occupations. Conversely, the results revealed higher aspirations among girls regarding occupational prestige and insignificant differences in leadership desire. Communion was found to be a significant moderator between gender and aspiration to typically feminine occupations, while agency mediated the relationship between gender and the prestige of occupational aspirations. Study 3 expands the focus of the dissertation and covers the role of self-stereotyping regarding agency and communion in school-related well-being. The results supported the androgyny model of well-being, but indicated the stronger importance of communion in adolescence and the school context than later in life. Study 4 investigates the *digital gender gap* in digital learning during pandemic-induced school closures, taking both biological sex as well as gender self-stereotyping

into account in order to investigate the role of gender in different components of this stereotyped domain. Contrary to expectations, the results challenge the notion of girls' potential disadvantages in the virtual classroom and reveal their relatively higher levels of perceived social support from teachers, intrinsic value and engagement in digital learning. No significant sex differences were found in competence beliefs regarding digital learning. Furthermore, the results indicated clear benefits of an androgynous gender role self-concept for all studied components of digital learning. The contribution of this dissertation is manifold. First, it shows that core traits in adolescent boys' and girls' self-concept are shifting away from stereotypical toward more neutral and balanced patterns. Second, it highlights the importance of communion in adolescence and in school context. Third, it underlines benefits of an androgynous self-concept for optimal school functioning in terms of engagement and enjoyment in learning – in both onsite and digital setting, social relatedness and positive affect. Fourth, it provides guidelines for designing curricula and interventions to improve and maximize boys' and girls' learning and psychological adjustment in school. Finally, it discusses factors that foster and impede gender inequalities in work and life opportunities for men and women. Thus, the findings of the four studies contribute to the literature on gender self-stereotyping regarding agency and communion, providing directions and opportunities for further research.

Zusammenfassung

In einer Gesellschaft bestimmen Geschlechterstereotype die Erwartungen darüber, wie Männer und Frauen sein können und sollen, was sie tun können und sollen und wie erfolgreich sie in einer bestimmten Rolle sind. Diese Erwartungen basieren auf einer angenommenen Passung der Expressivität der Frauen in menschenzentrierten Bereichen und unterstützenden Rollen, sowie der Instrumentalität von Männern in unpersönlichen und technikintensiven Bereichen und Machtrollen. In der frühen Adoleszenz, in welcher die Vorbereitung auf die Annäherung an die Erwachsenenrollen beginnt (Hill & Lynch, 1983), übernehmen Individuen stereotype Rollen und Verhaltensweisen in ihr Selbstkonzept. Das Ziel dabei ist, kognitive Konsistenz zu erreichen und der Inkongruenz zwischen sozialen Erwartungen und dem Selbst zu vermeiden (Bem, 1981; Tajfel & Turner, 1986). Das hat weitreichende Konsequenzen für Buben und Mädchen in den verschiedensten Lebensbereichen - von der psychischen Gesundheit bis hin zu Bildungsbeteiligung und Karriereoptionen. Ziel der vorliegenden Dissertation war es daher zu untersuchen, 1) ob sich Jugendliche heutzutage nach wie vor Geschlechterstereotypen zuschreiben und ob sich ihre geschlechtsspezifische Identität während der frühen Adoleszenz verstärkt, wobei die Selbst-Stereotypisierung mit einer valideren Methode gemessen wurde, als in früheren Studien und 2) wie die Selbst-Stereotypisierung sich auf ihre psychische Funktion in Hinblick auf Berufswünsche, schulisches Wohlbefinden und digitales Lernen, welches vor allem während der COVID-19 Pandemie relevant ist, auswirkt. Studie 1 zeigte zwar stereotype, aber nur kleine Geschlechtsunterschiede in Bezug auf Instrumentalität und Expressivität und fand keine Belege für eine geschlechtsspezifische Intensivierung. Darüber hinaus wurden in nur 17% der genannten Attribute signifikante Geschlechtsunterschiede gefunden. Die Ergebnisse weisen somit auf größere Geschlechtergleichheiten als Geschlechtsunterschiede in der Selbstbeschreibung von Jugendlichen hin. In Studie 2 wurden signifikante Geschlechtsunterschiede in der Geschlechtstypizität der Berufswünsche gefunden, wobei Jungen eine klare Präferenz für typisch männliche Berufe und Mädchen für typisch weibliche Berufe äußerten. Jedoch zeigten die Ergebnisse höhere Aspirationen in Bezug auf berufliches Prestige bei Mädchen und keine signifikanten Unterschiede bezüglich des Wunsches auf Führung. Expressivität erwies sich als ein signifikanter Moderator von Geschlecht und dem Streben nach typisch weiblichen Berufen, während Instrumentalität die Beziehung zwischen Geschlecht und

dem Prestige des Berufswunsches mediierte. Studie 3 erweiterte den Fokus der Dissertation auf die Rolle von Selbst-Stereotypisierung bezüglich Instrumentalität und Expressivität in Hinblick auf schulisches Wohlbefinden. Die Ergebnisse unterstützen zwar das Androgynitätsmodell des Wohlbefindens, zeigten aber auch die höhere Wichtigkeit von Expressivität im Jugendalter und Schulkontext, als im späteren Leben auf. Studie 4 untersuchte den *digital gender gap* beim digitalen Lernen während den pandemiebedingten Schulschließungen, wobei sowohl das biologische Geschlecht als auch die geschlechtsspezifische Selbst-Stereotypisierung berücksichtigt wurden, um die Rolle des Geschlechts in verschiedenen Komponenten dieser stereotypisierten Domäne zu untersuchen. Entgegen den Erwartungen widerlegen unsere Ergebnisse die Vorstellung von einer möglichen Benachteiligung von Mädchen im virtuellen Klassenzimmer und zeigen deren verstärkt wahrgenommene soziale Unterstützung durch Lehrer*innen sowie höhere intrinsische Motivation und Engagement beim digitalen Lernen. In Bezug auf Kompetenzüberzeugungen hinsichtlich digitalen Lernens wurden keine signifikanten Geschlechterunterschiede gefunden. Die Ergebnisse zeigten auch klare Vorteile der androgynen Geschlechterrolle bezüglich aller untersuchten Komponenten von digitalem Lernen auf. Der wissenschaftliche Beitrag dieser Dissertation ist vielfältig. Erstens zeigt sie, dass sich Kernmerkmale des Selbstkonzepts von adoleszenten Buben und Mädchen weg von stereotypen, hin zu neutraleren und ausgewogeneren Mustern bewegen. Zweitens betont sie die Wichtigkeit von Expressivität in der Adoleszenz und im schulischen Kontext. Drittens unterstreicht sie die Vorteile eines androgynen Selbstkonzeptes für ein optimales Zurechtkommen in der Schule in Bezug auf die Teilnahme an und der Freude am Lernen – sowohl vor Ort und im digitalen Setting als auch bezüglich sozialer Eingebundenheit und positivem Affekt. Viertens bietet sie Richtlinien zur Gestaltung von Lehrplänen und Interventionen, um das Lernen und die psychologische Anpassung von Jungen und Mädchen in der Schule zu verbessern. Schließlich werden Faktoren erörtert, welche die geschlechtsspezifischen Ungleichheiten in Bezug auf Arbeits- und Zukunftschancen von Männern und Frauen fördern oder behindern. Somit tragen die Ergebnisse der vier Studien zur Literatur über geschlechtsspezifische Selbst-Stereotypisierung bezüglich Instrumentalität und Expressivität bei und zeigen Richtungen sowie Möglichkeiten für weitere Forschung auf.

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EDUCATION

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Sep 2018 – present **University Assistant (praedoc)** at the Faculty of Psychology, University of Vienna
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SCIENTIFIC ARTICLES

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CONFERENCES

Oral presentations

- **Korlat, S.**, Holzer, J., Pelikan, E., Lüftenegger, M., Schober, B., & Spiel, C. (2021, February). *Learning under COVID-19: Challenges for Self-regulation*. Keynote speech at World Education Leadership Symposium (Online Conferences; Zug, Switzerland)
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- | | |
|------|--|
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