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With a Little Help from My Friends: Profiles of Perceived Social Support and Their Associations with Adolescent Mental Health

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Abstract

This study investigated profiles of perceived social support and their associations with mental health indicators for male and female adolescents. The sample was a nationally representative group of Danish adolescents age 13–16 years (Male $N = 1114$; Female $N = 1065$). Latent profile analysis was used to identify profiles of perceived social support from different sources (classmate, teacher, family, friend). Three distinct profiles of perceived social support were identified for both genders: ‘High’ support from all sources (54.4% of males; 55.5% of females), ‘Moderate’ support from all sources (31.6% of males; 28.8% of females) and ‘Low friend’ support with moderate support from other sources (13.9% of males; 15.7% of females). The ‘high’ perceived support profile was associated with optimal mental health; the ‘moderate’ perceived support profile was associated with lower wellbeing and more frequent emotional symptoms; and the ‘low friend’ perceived support profile was associated with the lowest levels of wellbeing and, specifically for females, higher frequency of emotional symptoms. Results highlight typical profiles of perceived social support among adolescents, and demonstrate nuanced associations between perceived social support and mental health indicators, with notable gender differences.

Keywords Social support · Mental health · Psychological wellbeing · Latent profile analysis · Adolescents

Highlights

- Three distinct profiles of perceived social support were identified among a large, representative sample of adolescents.
- Perceived social support profiles were associated with levels of psychological wellbeing and emotional symptoms.
- For females especially, the profile characterised by low support from friends was associated with poor mental health.
- Results have implications for identifying young people at risk of mental health difficulties.

Social support refers to the social resources that are available, or provided, to an individual through support groups or informal helping relationships (Gottlieb & Bergen, 2010). Adolescence confers a vulnerability to developing mental health difficulties (Blakemore, 2019), but social support may offer some protection and moreover, enable adolescents to flourish (Feeney & Collins, 2015; Rueger et al., 2016). Perceived social support (i.e., an individual’s beliefs about the support that is available to them) has been

consistently associated with high wellbeing and low levels of emotional symptoms, more so than other measures of support such as social networks, which are characterised by the number and type of social relations (Chu et al., 2010; Heerde & Hemphill, 2018; Rueger et al., 2016). However, there are nuances in that relationship that require further exploration.

First, perceived social support is complex because perceptions can relate to different kinds of support offered by various people in an individual’s life (Bokhorst et al., 2010). Despite that, traditional variable-oriented methods of studying those constructs (e.g., regression analyses) fail to capture diverse patterns of social support experienced by adolescents (Lanza & Cooper, 2016). To better understand the complexity of perceived social support and how it relates to mental health, it is necessary to investigate profiles of perceived social support so that multiple indicators of support from different sources

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(e.g., family, friends, teachers and classmates) can be simultaneously considered (Ciarrochi et al., 2017; Schwartz-Mette et al., 2020). Latent profile analysis (LPA) can be used for this purpose as it analyses individual response patterns across many items and identifies common profiles in the population. The profiles can differ both quantitatively (i.e., level of support) and qualitatively (i.e., type or source of support) thereby providing a more complex and comprehensive representation of social support (Lanza & Cooper, 2016). Those profiles are of substantive interest because they can reveal prevalent patterns of perceived social support among adolescents, and allow the relationship between *specific* patterns of social support and mental health to be investigated (Scholte et al., 2001).

Another aspect that requires further investigation is how those relationships differ for male and female adolescents. Biological differences, gender-roles and gender expectations can affect mental health, social support, and the relationship between them (Van Droogenbroeck et al., 2018). Gender socialisation theory offers a useful theoretical framework, positing that a range of inter-related processes (e.g., social learning, schematic and cognitive development) and socialisation agents (e.g., parents, peers, media) socialise girls and boys to think, feel, and behave differently, according to societal expectations of gender roles and norms (Kretchmar, 2011). For example, gender socialisation encourages girls be more emotionally sensitive and expressive, place a strong emphasis on academic performance, and to have different expectations about friendships than boys (Van Droogenbroeck et al., 2018). Further, Rudolph and Dodson's (2022) study of friendship values found that girls prioritise intimacy and support, while boys emphasize companionship and enjoyment. Gender intensification theory indicates that these gender differences are particularly salient in adolescence, as pressure to conform to gender roles increases (Sravanti & Kommu, 2020). Yet many studies do not investigate those relationships separately for males and female adolescents (Chu et al., 2010). Understanding gender differences in how social support relates to mental health is important for selecting appropriate strategies for mental health promotion.

To date, few studies have investigated profiles of perceived social support among adolescents. Those that do have not examined whether there are different profile structures for males and females (e.g., Ciarrochi et al., 2017). Therefore, we need research that examines gender differences in perceived social support profiles and how they relate to mental health. This can improve our understanding of those developmental phenomena, which in turn can inform the development and selection of preventive interventions, and help to find ways to address gender inequalities in mental health. In order to address those gaps in the literature, the current study: (1) used latent profile analysis (LPA) to identify underlying (latent) profiles of

perceived social support among a large and representative sample of Danish adolescents (aged 13–16), and (2) investigated the relationship between those profiles and aspects of mental health. Consistent with contemporary 'dual-factor' or 'dual-continua' perspectives on mental health (e.g., Iasiello & Van Agteren, 2020; Wang et al., 2011), which consider both psychopathology and mental wellbeing to be important and distinct aspects of mental health, we investigated how perceived social support profiles were associated with aspects of mental distress (specifically, emotional symptoms) and psychological wellbeing.

Heterogeneous Profiles of Social Support

Social support is multi-faceted and is provided by different people in an individual's life. Key sources of social support during adolescence include family (Rothon et al., 2012), friends (Rigby, 2000), classmates (Auerbach et al., 2011), and teachers (Suldo et al., 2009). However, adolescence is a time of biological and social change, meaning that those relationships are evolving and can be precarious at times (Choudhury et al., 2006). During adolescence there is a shift from primary relationships being with parents, to more diverse and interlinked social networks (Collins & Laursen, 2004). Furthermore, adolescents become more aware of their social environment (Blakemore & Mills, 2014). Consequently, relationships with important adults may change and peer relationships take on a new importance in adolescence, meaning that friendships may intensify and offer greater support than before. However, relationships will not develop in the same way for all adolescents. Rather than developing closer, supportive friendships, some youths may experience rejection from peers, the impact of that being intensified due to sensitivity to their social environment (Sebastian et al., 2010). It is clear that the social world of adolescents is multifarious, changing and likely to be experienced in different ways. Consequently, perceived social support from those relationships may also differ considerably from person to person.

To date, most studies examining relations between perceived social support and mental health have used *variable-oriented* methods, which aggregate scores from all adolescents and find general relationships between variables (see Chu et al., 2010; Rueger et al., 2016). That approach is useful for teasing apart aspects of social support and identifying correlates. However, it does not capture the complexity of different profiles of support, or heterogeneity within the population (Bergman & Andersson, 2015; Lanza & Cooper, 2016).

In recognition of this, a small number of extant studies have taken a *person-oriented* approach to investigate social

support among adolescents. These approaches aim to identify subgroups of adolescents with distinct patterns/profiles of social support. Social support profiles have been identified using a range of methods including, configural frequency analysis (Laursen et al., 2006; Laursen & Mooney, 2008; Rosenfeld et al., 2000), cluster analysis (Scholte et al., 2001) and latent profile analysis (Ciarrochi et al., 2017; Jager, 2011). Not all studies focused on perceived social support, for example, Jager (2011) used information about the size and quality of social networks to create profiles, and studies have focussed on different sources of support, so the resultant profiles are not directly comparable. However, all studies identified some profiles that indicated convergent social support (i.e., similar levels of social support from all sources), and some profiles that indicated divergent social support (i.e., differing levels of support from those around them). For example, Ciarrochi et al. (2017) investigated perceived support from parents, peers, and teachers, and identified four convergent profiles of perceived social support distinguished by levels of support, and two divergent profiles; one indicating high parent and peer support, and the other indicating high peer support only. In addition, Scholte et al. (2001) investigated father, mother, special sibling, and friend perceived support, and identified three convergent profiles (i.e., high, average, and low overall support) and two divergent profiles (i.e., ‘mixed support’ and ‘non-friend’). This suggests that social support can differ both quantitatively (i.e., high versus low) and qualitatively (i.e., different patterns of support). Person-oriented studies have also indicated that social support profiles are associated with distinct mental health and developmental outcomes (Ciarrochi et al., 2017; Laursen et al., 2006; Laursen & Mooney, 2008; Rosenfeld et al., 2000; Scholte et al., 2001), which further suggests the importance of investigating profiles rather than overall levels of perceived support.

The person-centred approach for investigating social support among adolescents is important for uncovering common profiles of perceived social support and associations with mental health and wellbeing. However, further research is required because existing studies sometimes omit key sources of support for adolescents (e.g. from teachers or classmates), meaning that potentially important profiles remain unexplored. Close friends and family are important sources of support, but because adolescents spend a substantial amount of their time in school, the support received from teachers may be pivotal in shaping adolescents’ overall sense of wellbeing (Tennant et al., 2015). Likewise, the impact of supportive relationships among classmates on adolescents’ wellbeing, and the potential negative consequences of unsupportive relationships has been consistently demonstrated (Bi et al., 2021; Coyle et al., 2021). A further important gap in the literature is the lack of

investigation into gender differences in profiles of support, despite evidence suggesting that social support may be perceived and used differently by males and females, serving distinct functions in social and emotional development (Taylor, 2011; Van Droogenbroeck et al., 2018). Understanding these gender-specific dynamics can provide valuable insights into which areas of support are crucial for promoting good mental health, and for identifying those who may benefit the most from specific forms of support. By expanding the scope of research to include key sources of support such as teachers and classmates, and by considering gender differences in the perception and impact of perceived social support, the current study provides a more comprehensive understanding of the intricate relationships between social support, mental health, and adolescent development.

Social Support and Gender

Theory suggests that females may appraise social support differently to males because they value relationships and intimacy differently and put more emphasis on developing social relationships (Gilligan, 1982; Kretchmar, 2011). Further, key differences in social relationships and support have been identified between male and female adolescents. For example, females tend to form close personal attachments with friends, whereas males typically form friendships based on shared interests, so while they may have more friends, relationships may offer less emotional support (Taylor, 2011). Furthermore, studies have consistently found that females perceive more social support from close friends, and classmates, yet, males and females perceive similar levels of parental support (Bokhorst et al., 2010; Rueger et al., 2008; 2010). The evidence is mixed regarding perceived teacher support: some studies found that females perceived higher support from teachers (Bokhorst et al., 2010; Rueger et al., 2010), while others found no significant difference (e.g., Rueger et al., 2008). This suggests that perceptions of social support vary systematically for male and female adolescents. Therefore, it is necessary to carry out separate analyses for males and females so that any differences in perceived social support profiles can be identified, as well as any variations in how those profiles relate to mental health.

Associations between Social Support and Mental Health

Several systematic reviews have indicated that social support is associated with positive indicators of mental health (i.e., psychological wellbeing) and mental health difficulties, such

as depression (Chu et al., 2010; Gariépy et al., 2016; Rueger et al., 2016; Schwartz-Mette et al., 2020). In particular, it is perceived social support that is most closely associated with improved mental health over other measures of support, such as the number and quality of social connections or enacted support (i.e., actual support received; Chu et al., 2010; Turner & Brown, 2010). There are several possible reasons for this, for example the number of social connections may not necessarily translate into support as some connections may be unsupportive or even damaging, and support received may not be the support that was needed (Chu et al., 2010). On the other hand, perceived social support may be beneficial because feeling like others are on your side during difficult times really makes a difference (Uchino et al., 2018).

Longitudinal studies indicate that high social support predicts better mental health outcomes over time (Rueger et al., 2016). It has been proposed that social support acts both indirectly and directly to improve mental health (Cohen & Wills, 1985). Directly, social support improves mental health by increasing positive affect and self-worth (Cohen & Wills, 1985) and by regulating mood, thought, and behaviour through everyday interactions (Lakey & Orehek, 2011). It also provides individuals with a secure base from which they can develop and grow (Feeney & Collins, 2015). Indirectly, social support acts as a buffer against the negative effects of stressful situations, weakening the link between stress and adverse outcomes, including mental distress (Rueger et al., 2016; Uchino et al., 2018). Indeed, social support has been identified as an important coping mechanism for adolescents, moderating the relationship between stress and mental distress (Cicognani, 2011). Moreover, having supportive relationships through times of adversity may even allow an individual to grow stronger than before (Feeney & Collins, 2015).

In addition to the aforementioned gender differences in mental health, and perceptions of support, there are gender differences in how social support relates to mental health. It has been suggested that social support is more important for ensuring good mental health among females (Gilligan, 1982), possibly because females are more likely to seek social support as a means to cope with stress (Eschenbeck et al., 2007). Furthermore, some sources of support seem more important for promoting good mental health for either males or females. For example, Rueger et al. (2010) found classmate support predicted lower rates of depression for males but not females. Further, qualitative research indicates that males prioritise support that helps them forget about their problems (e.g., being around people that keep them busy and help them forget their worries), whereas females prioritise support that helps them understand their problems (e.g., talking to close friends), therefore, social support from different sources may serve different functions in terms of how they help

males and female manage distress (Martínez-Hernández et al., 2016). Despite those differences, many studies investigate the relationship between social support and mental health for combined samples of males and females (Chu et al., 2010) and this may obscure distinct gender-specific relations.

The Current Study

The first aim of the current study was to identify perceived social support profiles among a large and nationally representative sample of Danish adolescents. This was important to better understand young people's perceptions of the social resources available to them during a critical developmental phase in which the nature and importance of different relationships is evolving. Our second aim was to investigate the nuanced relationship between perceived social support profiles and aspects of mental health for males and females. This was important in order to understand those developmental phenomena better, and to gain insights regarding who could benefit most from mental health interventions that aim to improve social support.

Building on the extant literature outlined above, the current study provides several advancements. First, in contrast to the predominant variable-focused approach taken in much prior research, we use a person-oriented method that is better equipped to capture the complexity of different profiles of support and heterogeneity within the population (Bergman & Andersson, 2015; Lanza & Cooper, 2016). Second, rather than assuming, as most prior literature has done, that gender does not moderate mental health, social support, and the relationship between them, we purposefully examine its role. Third, we include oft-omitted sources (e.g., teachers and classmates) in order to offer a more comprehensive profile of social support than has been possible in previous work. Fourth, we focus on adolescence, a critical period in terms of the development of mental health and also one in which the nature and importance of relationships with others are changing.

To achieve our aims, we used LPA to identify and determine the prevalence of family, friend, teacher, and classmate social support profiles, and subsequently examined associations between those profiles and indicators of psychological wellbeing and emotional distress. LPA is a data-driven, model-based, clustering approach. It confers some advantages over other person-oriented methods, such as cluster analysis or configural frequency analysis as it does not require the use of artificial cut-offs and, as it is model-based, it can account for measurement error and can be extended to include covariates and outcome variables (Berlin et al., 2013; Vermunt & Magidson, 2002).

There are three research questions under investigation:

What are the key underlying profiles of perceived social support among adolescent males and females, and how prevalent are they?

Are different perceived social support profiles in adolescence associated with (a) levels of psychological wellbeing, and/or (b) frequency of emotional symptoms? Are relations between perceived social support profiles and mental health indicators comparable for male and female adolescents?

The study was necessarily exploratory as the number and type of social profiles that would be identified for male and female adolescents was not known a priori. However, based on extant theory and research, we made the following general predictions: (1) In relation to research question one, we predicted that LPA would identify a profile or profiles that indicated convergent perceived social support from all sources. Such profiles would indicate overall quantitative differences in perceived social support (e.g., high, medium or low perceived social support from all sources). We also predicted that we would find a profile or profiles that indicated divergent perceived social support from key figures in an adolescents' life (e.g., high support from one source but not another), which would indicate qualitative differences in perceived social support. In terms of research question two, based on variable-oriented research showing a positive relationship between perceived social support and good mental health, we predicted that those with profiles indicating high levels of perceived support would have high psychological wellbeing and low frequency of emotional symptoms. Further, nuanced relationships may be indicated between distinct profiles of perceived social support and mental health. Finally, in relation to research question three, owing to gender differences in how social support is experienced and mobilised, it was our expectation that different relationships between perceived social support profiles and mental health outcomes may be observed for males and females, although the exact nature of those differences was to be explored.

Method

Sample and Dataset

We used the 2018 wave of Danish data collected as part of the Health Behaviour in School-aged Children (HBSC) study (Inchley et al., 2020). The HBSC is a cross-national project that collects data about adolescents' wellbeing, health behaviour, and social context in more than 56 countries worldwide every four years. To ensure a representative sample of adolescents in Denmark, sampling of the participating

schoolchildren was based on a random selection of schools from complete lists of public and private schools in Denmark. The sample was further stratified into six geographical regions in Denmark to accomplish the same relative representativeness in those regions. Within each selected school, data was collected from all schoolchildren in the fifth, seventh, and ninth grade, corresponding to 11-, 13- and 15-year-olds. Every school that declined participation was replaced by another school drawn from the same list of random schools. The participation rate at school level was 20%. The most common reason for school level non-participation was time pressure or that the school had recently participated in a similar health survey. Denmark is one of the few countries in the HBSC project that collect data on psychological wellbeing using the Shorter Warwick and Edinburgh Mental Well-Being Survey (SWEMWBS). Only data from adolescents in Grades 7 and 9 were used in the present study because SWEMWBS was not validated for use with Grade 5 children (Clarke et al., 2011). Across Grades 7 and 9, there were 1114 males and 1065 females, of which 1082 males and 1054 females responded to one or more perceived social support items, meaning that they could be included in the analysis (table of sample characteristics presented as Table 1).

Measures

Perceived Social Support

Fourteen self-reported items were used as indicators for the latent social support profiles. They measured perceived social support from: classmates (three items), teachers (three items), family (four items), and friends (four items). Each item was included separately in the analysis so that profiles represented qualitative and quantitative differences in social support. Essentially, including individual items as indicators meant that profiles were free to vary on specific aspects of support. Item responses for classmate, teacher, and family perceived social support were on a 5-point Likert scale. Item responses for perceived social support from friends were on a 7-point Likert scale. LPA is able to incorporate profile indicators that have different response scales, so rescaling was not required (Vermunt & Magidson, 2002). For the analysis it was necessary to treat items as continuous because treating them as categorical led to a model that was too complex to converge on a final solution in Mplus. When Likert responses contain more than five response options there is an argument that they can be adequately treated as continuous variables (Rhemtulla et al., 2012), thus, the model was simplified in this way.

Classmate Support Items These were taken from the Teacher and Classmate Support Scale, (Torsheim et al.,

Table 1 Table of Sample Characteristics and Mean Responses

Sociodemographics	n	Male N = 1114		Female N = 1065	
		n	%	n	%
Grade					
Grade 7 (age 13–14 years)	620		55.7	603	56.6
Grade 9 (age 15–16 years)	494		44.3	462	43.4
Occupational socio-economic class					
High	410		38.7	392	37.5
Medium	395		37.3	414	39.7
Low	106		10.0	116	11.1
Unclassified	149		14.1	122	11.7
Ethnicity					
Ethnic Dane	968		88.0	935	88.9
Non-ethnic Dane	132		12.0	117	11.1
Social support items					
	M (SD)			M(SD)	
Classmate support					
enjoy being together	4.05 (0.84)			3.85 (0.86)	
kind/helpful	4.01 (0.86)			3.91 (0.86)	
accept me	4.10 (0.91)			3.80 (0.95)	
Teacher support					
accept me	4.15 (0.91)			4.04 (0.87)	
care about me	3.90 (0.95)			3.72 (0.94)	
trust	3.82 (1.08)			3.53 (1.11)	
Family support					
tries to help	4.55 (0.69)			4.46 (0.75)	
get emotional help	4.46 (0.78)			4.35 (0.87)	
talk about problems	4.28 (0.91)			4.15 (0.97)	
help make decisions	4.43 (0.75)			4.36 (0.79)	
Friend support					
try to help	5.88 (1.42)			5.95 (1.39)	
count on	5.99 (1.43)			5.99 (1.39)	
share sorrow/joy with	6.01 (1.46)			6.16 (1.38)	
talk about problems	5.83 (1.58)			5.97 (1.48)	
Mental health outcomes					
		M (SD)		M (SD)	
Psychological wellbeing (SWEMWBS DK)		25.53 (4.94)		23.28 (4.52)	
Sad: frequency		1.54 (0.90)		2.34 (1.25)	
Irritable/bad mood: frequency		2.24 (1.13)		2.74 (1.23)	
Nervous: frequency		2.00 (1.04)		2.46 (1.24)	

M mean, *SD* standard deviation, *SWEMWBS* Short Warwick-Edinburgh Mental

Wellbeing Scale- Danish Version. Classmate, teacher, and family support items are on a scale of 1–5; friend support items are on a scale of 1–7; SWEMWBS-DK is on a scale of 7–35; emotional symptoms (sad, irritable/bad mood, nervous) are on a scale of 1–5

2012). Items were ‘Classmates enjoy being together’, ‘Classmates are kind/helpful’, and ‘Classmates accept me as I am’. Responses were on a 5-point Likert where 1 = ‘strongly disagree’, 2 = ‘disagree’, 3 = ‘neither agree nor disagree’, 4 = ‘agree’, and 5 = ‘strongly agree’.

Teacher Support Items These were developed specifically for the HBSC. Items were: ‘I feel that my teachers accept me as I am’, ‘I feel that my teachers care about me’, and ‘I feel that I can trust my teachers’. Responses were on a 5-point Likert where 1 = ‘strongly disagree’, 2 = ‘disagree’, 3 = ‘neither agree nor disagree’, 4 = ‘agree’, and 5 = ‘strongly agree’.

Family Support Items These were taken from the family subscale of the Multidimensional Scale of Perceived Social Support (MSPSS; Zimet et al., 1988). Items were: ‘My family really tries to help me’, ‘I get the emotional help and support I need from my family’, ‘I can talk to my family about my problems’ and ‘My family would like to help me make decisions’. Responses were on a 5-point Likert where 1 = ‘strongly disagree’, 2 = ‘disagree’, 3 = ‘neither agree nor disagree’, 4 = ‘agree’, and 5 = ‘strongly agree’.

Friend Support Items These were taken from a subscale of the MSPSS (Zimet et al., 1988) Items were: ‘My friends really try to help me’, ‘I can count on my friends when there is something that goes wrong’, ‘I have friends that I can share my sorrow and joy with’, ‘I can talk with my friends about my problems’. Responses were on a 7-point Likert where 1 = ‘strongly disagree’ and 7 = ‘strongly agree’¹.

Mental Health

Psychological Wellbeing This was measured using an adapted Danish version of the SWEMWBS (Stewart-Brown et al., 2009). The original (S)WEMWBS has been translated into Danish and validated in a Danish adult population (Koushede et al., 2019), but the Danish HBSC team tested and used a slightly different translation for use among adolescents. The scale consisted of 7-items asking how often participants: ‘feel that things will go well in the future’, ‘feel useful’, ‘feel relaxed’, ‘solve problems well’, ‘think clearly’, ‘feel close to other people’, ‘have your own opinions’. In the HBSC questionnaire, responses were on 5-point scale. The original questionnaire responses were reversed so that higher scores indicated higher wellbeing, therefore, 1 = never, 2 = rarely, 3 = sometimes, 4 = mostly, 5 = always. Summed scores ranged from 7–35. The 7-item SWEMWBS was originally developed from the 14-item WEMWBS by means of Rasch analysis, providing a raw score to interval scale transformation (Stewart-Brown et al., 2009). Rather than using the original conversion table that was developed using an adult Scottish sample, here we report results which scored the SWEMWBS using a conversion table that had been developed from the Danish HBSC data by Rasch analysis (Damsgaard et al., in

¹ LPA can accommodate indicator variables with different response scales so standardisation was not necessary.

prep.). Multiple sensitivity analyses were conducted with the SWEMWBS scores converted using, (a) the original developers' conversion table, (b) the 7-item raw scores, and (c) the raw scores with the item 'feeling closely attached to someone' removed, as this may be considered closely related to perceived social support. Those sensitivity analyses are presented as Online Resource 2.

Emotional Symptoms These were measured using three separate items measuring the frequency of feeling: (1) sad, (2) irritable/in a bad mood, and (3) nervous. The items were from the HSBC symptoms checklist (Hetland et al., 2002). The original scoring was reversed so that higher scores indicated more frequent symptoms, therefore in the analysis, 1 = rarely/never, 2 = monthly, 3 = weekly, 4 = more than once a week, 5 = daily.

Sociodemographic Variables

The following sociodemographic variables were included as covariates in the analysis to control for their association with both perceived social support and mental health: (1) Grade (7 or 9), (2) ethnicity (ethnic Dane or non-ethnic Dane), (3) socio-economic status (SES) using a Danish measure of family occupational social class. Based on the highest-ranking parent, schoolchildren were grouped into family occupational class I (highest) to class V by the research group (Christensen et al., 2014). Family occupational class VI was added to include economically inactive parents who received benefits, and the category 'unclassifiable' was used to describe parents for whom there was insufficient information for coding of social class. Family occupational class was finally categorised into 'high' (family occupational class I-II), 'middle' (family occupational class III-IV), 'low' (family occupational class V-VI), and 'unclassifiable/missing'. In the analysis presented in the present paper, 'unclassified' has been treated as missing data and imputed using full information maximum likelihood (FIML) imputation. Sensitivity analyses were conducted where, (a) this group was treated as a group in its own right, and (b) missing data were deleted list-wise (see Online Resource 2 for sensitivity analyses).

Statistical Analyses

Latent Profile Analysis

For each gender, exploratory LPA, using perceived social support items as indicators, was conducted in Mplus v8.2. In the Danish education system, children remain in the same class and have the same teachers over a number of years. Therefore, clustering in the data due to classroom membership was accounted for using a sandwich estimator (in Mplus 'type = complex'). In order to select the model with the

optimal number of latent profiles, models with a consecutive number of profiles were estimated until convergence problems were encountered. The best-fitting model was selected using a range of fit statistics including Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC), and sample size adjusted BIC (ssaBIC), where smaller values indicate better model fit, and the Lo-Mendell-Rubin Likelihood Ratio Test (LMR-LRT), which indicates whether a model is a significantly better fit compared to a model with one profile fewer. Other substantive criteria were considered, such as parsimony (i.e., models with fewer profiles were preferred as we aimed to parsimoniously capture heterogeneity in the population, rather than all profiles), interpretability (i.e., profiles should be interpretable and distinct), and smallest class size (i.e., classes with less than 10% of the sample were discounted as they could be unstable; Masyn, 2013).

Latent Profile Regression Analysis

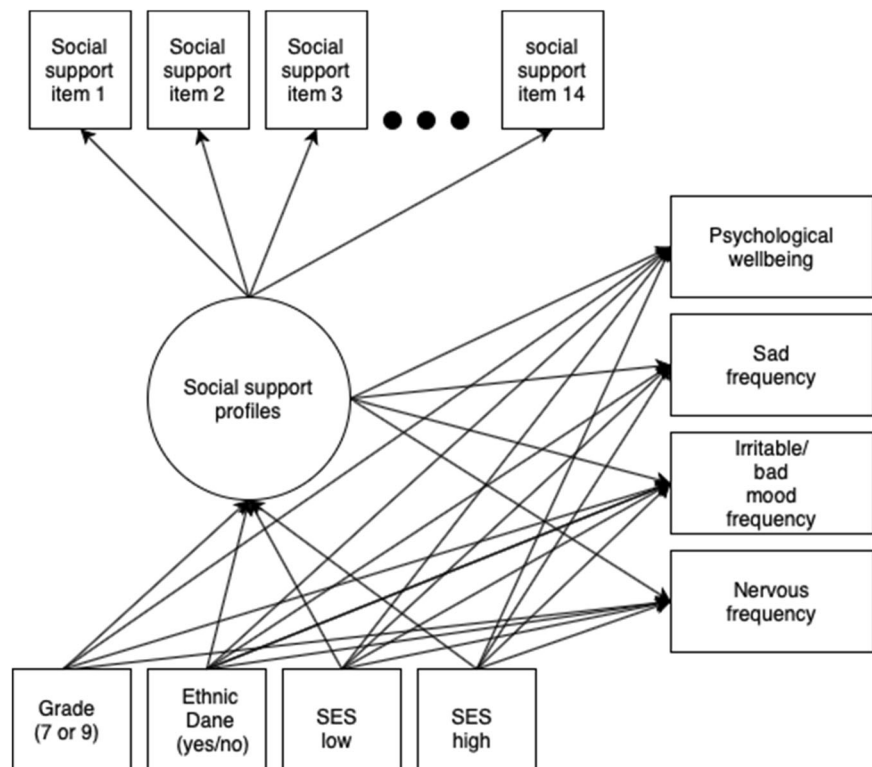
Once the best fitting model was selected, a latent profile regression analysis was performed to indicate the cross-sectional relationship between perceived social support profiles and different mental health outcomes. Grade, ethnicity, and occupational social class were included as covariates to control for their associations with social support and mental health (see Fig. 1).

The three-step procedure for including covariates (Vermunt, 2010) was used. Incorporating covariates and/or distal variables in the latent profile model in a single step is problematic because the covariates influence the formation of profiles, therefore, the original meaning of profiles is changed (Asparouhov & Muthén, 2014). The three-step method overcomes this issue by: (1) identifying the optimal number of latent profiles, (2) saving the most likely profile to which each individual belongs, along with classification error, and (3) carrying out regression analyses with the saved profiles and other variables, whilst taking misclassification into consideration (Asparouhov & Muthén, 2014). In our analyses, the optimal number of social support profiles were identified for males and females separately. The most likely social support profile and the probability of being assigned to that profile, for each participant was saved, and, in the final step, the covariates were included as predictor variables, with mental health outcomes included as outcome variables. Wald's tests were used to compare mean differences in mental health scores between classes. A conservative Alpha value of $p < 0.01$ was used to adjust for increased Type 1 error due to multiple testing.

Missing Data

Missing data on the social support items ranged from 3.3 to 6.4% for the male sample and from 1.0 to 2.5% for the female sample. Missing data on covariates and mental

Fig. 1 Conceptual Diagram Showing the Final Latent Class Model with Covariates and Distal Variables. Note. Latent social support profiles have 14 observed social support items as indicators covering classmate support (3-items), teacher support (3-items), family support (4-items) and friend support (4-items). Mental health variables (psychological wellbeing, frequency of feeling sad, irritable/in a bad mood and nervous) are included as distal variables. Grade, ethnicity, and socioeconomic status (SES) are included as covariates to control for associations with both social support profiles and mental health outcomes



health outcomes was below 5% except for total SWEMWBS score, which was missing for 14.2 and 7.5% of male and female samples respectively. For the SES variable, data were missing for 18.2% of the male and 13.4% of the female sample. Little's Missing Completely at Random (MCAR; Little, 1988) test indicated that data were MCAR for females (Chi-Square = 392.178, $df = 352$, $p = 0.069$), but not for males (Chi-Square = 723.569, $df = 562$, $p < 0.001$). However, because missingness was predicted by variables included in the model, the missing at random assumption (MAR; Enders, 2013) was considered reasonable. Missing data were imputed using Full Information Maximum Likelihood (FIML), which is a model-based method of imputation (Enders, 2010)².

Results

Perceived Social Support Profiles

Males

Exploratory LPA indicated that, although increasing the number of profiles resulted in better model fit (as indicated by smaller information criteria values), according to the

LMR-LRT, a 4-profile model was not a significantly better fit compared to a 3-profile model (see Table 2). In addition, the fourth profile represented only 4% of the sample, suggesting that it could be unstable (Masyn, 2013). Profiles were distinct and interpretable in the 3-profile model; thus, this model was selected. Entropy was greater than 0.8, indicating good classification accuracy.

The three profiles were: (1) a convergent high perceived social support profile, characterised by average responses between 'agree' and 'strongly agree' for all four support items. 54.4% of males had this profile, named 'high', (2) a convergent moderate perceived social support profile characterised by average responses between 'neither agree nor disagree' and 'agree' for all four social support items. 31.6% of males had this profile, named 'moderate', and (3) a divergent profile characterised by a unique pattern of moderate social support across teacher, classmate, and family support items (average responses between neither 'agree nor disagree' and 'agree') and lower perceived social support from friends than the other profiles. 13.9% of males had this profile, named 'low friend' (see Fig. 2 for a plot of mean responses for each perceived social support profile).

Females

For female adolescents, the same pattern emerged regarding the fit statistics and interpretability of profiles (see Table 2), and the 3-profile solution was selected. The three perceived social support profiles resembled the overall patterns of support found

² Sensitivity analysis was carried out where missing data on covariates was deleted list-wise producing similar results (see Online Resource 2).

Table 2 Fit Statistics, Classification Quality (Entropy), and Profile Size for Each Latent Profile Model

k	LL	AIC	BIC	ssaBIC	LMR-LRT (<i>p</i> -value)	Entropy	Profile size (model based)
Male sample							
1	-21077.6	42211.26	42350.88	42261.95	n/a	n/a	1082
2	-19276.4	38638.77	38853.19	38716.61	0.0000	0.95	212/ 870
3	-18539.2	37194.31	37483.53	37299.31	0.0117	0.87	151/ 342/ 589
4	-18122.1	36390.14	36754.16	36522.30	0.1477	0.92	47/ 295/ 621/ 1119
5	-17806.7	35789.34	36228.15	35948.65	0.4808	0.90	44/ 115/ 127/ 256/ 540
6	-17571.5	35349.09	35862.70	35535.56	0.1270	0.88	42/ 52/ 111/ 234/ 295/ 348
7	-17380.1	34996.20	35584.61	35209.82	0.6479	0.89	19/ 48/ 50/ 100/ 232/ 288/ 346
8	-17202.8	34671.60	35334.81	34912.38	0.3685	0.90	20/ 22/ 55/ 62/ 98/ 236/ 267/ 323
Female sample							
1	-20986.7	42029.41	42168.30	42079.36	n/a	n/a	1054
2	-18973.9	38033.87	38247.16	38110.59	0.0000	0.97	191/ 863
3	-18285.8	36687.60	36975.30	36791.08	0.0202	0.91	165/ 303/ 585
4	-17788.0	35722.06	36084.16	35852.30	0.2906	0.94	69/ 140/ 279/ 567
5	-17470.4	35116.70	35553.22	35273.71	0.0670	0.90	65/ 137/ 148/ 264/ 441
6	-17220.4	34646.72	35157.64	34830.50	0.1347	0.92	30/ 59/ 146/ 152/ 234/ 432
7	-16989.2	34214.50	34799.82	34425.03	0.2699	0.92	30/ 42/ 52/ 144/ 145/ 226/ 415
8	-16805.9	33877.74	34537.46	34115.03	0.4206	0.93	21/ 27/ 39/ 64/ 125/ 143/ 226/ 409
9	-16555.1	33406.17	34140.30	33670.23	0.5918	0.95	21/ 22/ 59/ 63/ 79/ 88/ 123/ 220/ 378

AIC Akaike information criteria, *BIC* Bayesian information criteria, *k* number of profiles specified in the model, *LL* loglikelihood, *LMR-LRT* Lo-Mendell-Rubin adjusted likelihood ratio test, *ssaBIC* sample size adjusted BIC. The selected model is shown in bold

among males and were labelled in the same way (i.e., ‘high’, ‘moderate’, ‘low friend’ support). The percentage of the population represented by each profile was similar to that found for males, with 55.5% with the ‘high’, 28.8% with the ‘moderate’ and 15.7% with the ‘low friend’ social support profile

Association with Mental Health Outcomes

Males

Males with a convergent ‘high’ perceived social support profile had the highest levels of mental wellbeing and lowest frequency of emotional symptoms (sad, irritable/bad mood, and nervous), compared to males with ‘moderate’ and ‘low friend’ perceived social support profiles.

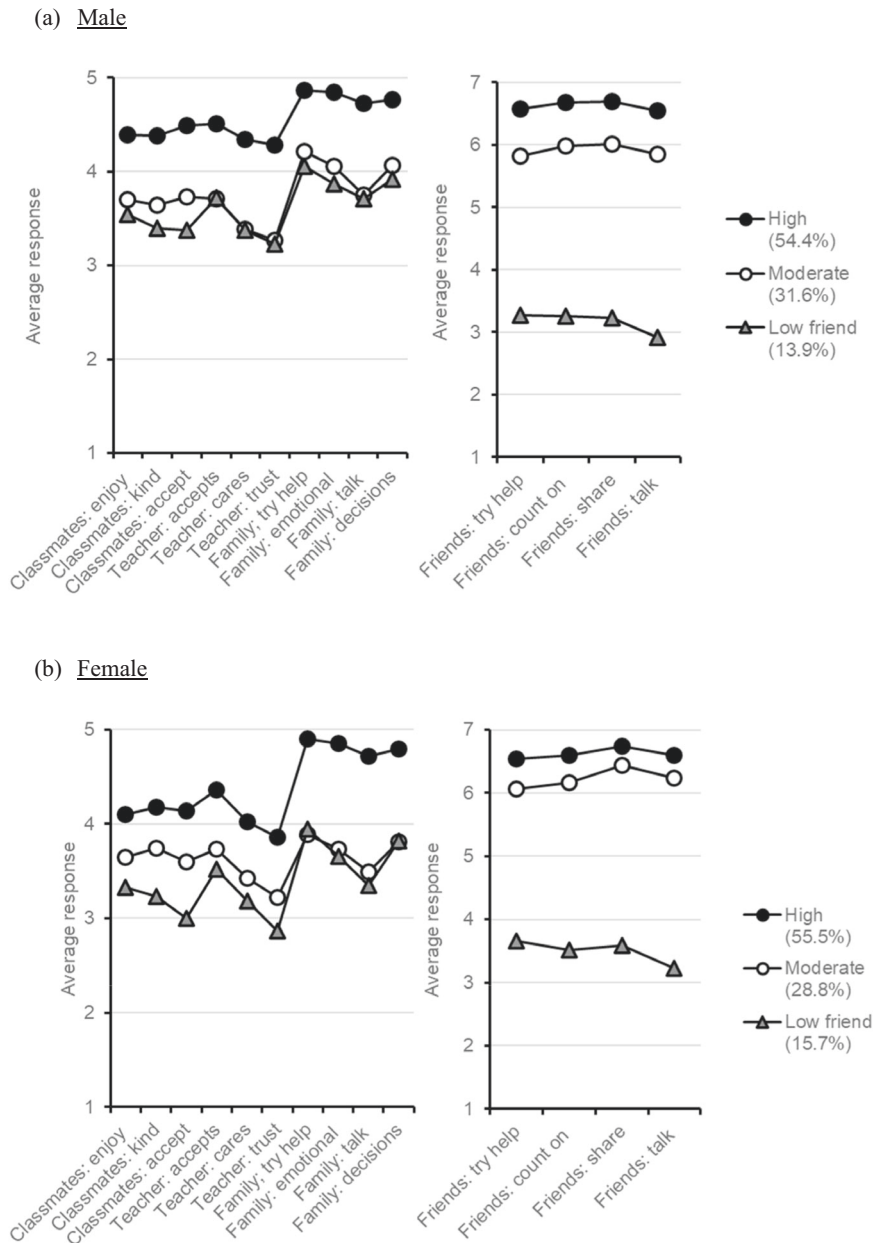
Psychological wellbeing was significantly lower for males with the ‘low friend’ profile compared to those with ‘moderate’ and ‘high’ profiles. In all sensitivity analyses, the lowest wellbeing scores were found for those with a ‘low friend’ support profile. However, in some sensitivity analyses the difference in psychological wellbeing for the ‘moderate’ and ‘low friend’ profile was not statistically significant (see Online Resource 2). This suggests that although wellbeing tends to be lower for males with ‘low friend’ perceived social support, compared to those with ‘moderate’ perceived social support, this difference may not be robust because it is sensitive to changes in modelling parameters. Frequency of emotional

symptoms were similar for males with ‘moderate’ and ‘low friend’ perceived social support profiles and there was no significant difference between the two groups (see Table 3 and Fig. 3). Overall, for male adolescents, perceiving high social support from all sources was associated with the best mental health outcomes, and having the ‘low friend’ perceived support profile was associated with lower psychological wellbeing, but not more frequent emotional symptoms, compared to those in the ‘moderate’ perceived social support group.

Females

For females, as for males, having a convergent ‘high’ perceived social support profile was associated with the highest levels of mental wellbeing and lowest frequency of emotional symptoms. Females with the ‘low friend’ perceived social support profile had the lowest levels of psychological wellbeing compared to those with ‘high’ and ‘moderate’ perceived social support profiles (see Table 3 and Fig. 3). This finding was statistically significant across all sensitivity analyses, attesting to its robustness (Online resource 2). In addition, the ‘low friend’ group experienced more frequent emotional symptoms. This pattern was observed for all symptoms across sensitivity analyses, however, in some cases the *p*-values for difference in irritability and, in one case, nervousness, fell just short of the *p* < 0.01 threshold. A significant difference in the frequency of feeling sad was

Fig. 2 Line Plot Showing Average Responses for Each Social Support Profile. Friend support items are shown on a separate scale because responses for those items were on a 7-point scale whereas other item responses were on a 5-point scale. Panel (a) shows the results for males and panel (b) shows the results for females



consistently found between the ‘moderate’ and ‘low friend’ groups. Overall, for female adolescents, perceiving high levels of support from all sources was associated with optimal mental health outcomes, and having a ‘low friend’ perceived social support profile was associated with low psychological wellbeing and higher frequency of emotional symptoms, compared to those with ‘high’ and ‘moderate’ perceived social support profiles.

Discussion

This study indicates that, when four important sources of perceived social support (i.e., classmates, teachers, family, and

friends) are simultaneously considered, three distinct profiles of perceived social support can be identified for male and female adolescents. The profiles indicate key patterns of perceived social support, which contribute to our understanding of young people’s perceived social resources. Typically, young people experience converging levels of perceived support from classmates, teachers, family and friends, whether that be high or moderate support from all sources. However, we also identified a smaller, yet still substantial, group that had a divergent profile of perceived social support, where they perceived very little support from friends whilst still perceiving moderate support from other sources. Furthermore, the profiles had distinct associations with mental health outcomes. By investigating those relationships separately for males and

Table 3 Mental Health Outcomes by Social Support Profile

	High social support (a)	Moderate social support (b)	Low friend social support (c)
Male sample			
SWEMWBS DK	27.60 ^{bc}	23.74 ^{ac}	21.83 ^{ab}
Sad frequency	1.18 ^{bc}	1.97 ^a	1.86 ^a
Irritable/bad mood frequency	1.79 ^{bc}	2.75 ^a	2.75 ^a
Nervous frequency	1.66 ^{bc}	2.40 ^a	2.28 ^a
Female sample			
SWEMWBS DK	25.08 ^{bc}	21.67 ^{ac}	19.15 ^{ab}
Sad frequency	1.94 ^{bc}	2.67 ^{ac}	3.11 ^{ab}
Irritable/bad mood frequency	2.40 ^{bc}	3.05 ^a	3.38 ^a
Nervous frequency	2.20 ^{bc}	2.65 ^{ac}	3.04 ^{ab}

Superscript letters indicate a significant difference ($p < 0.01$) when compared to the lettered profile

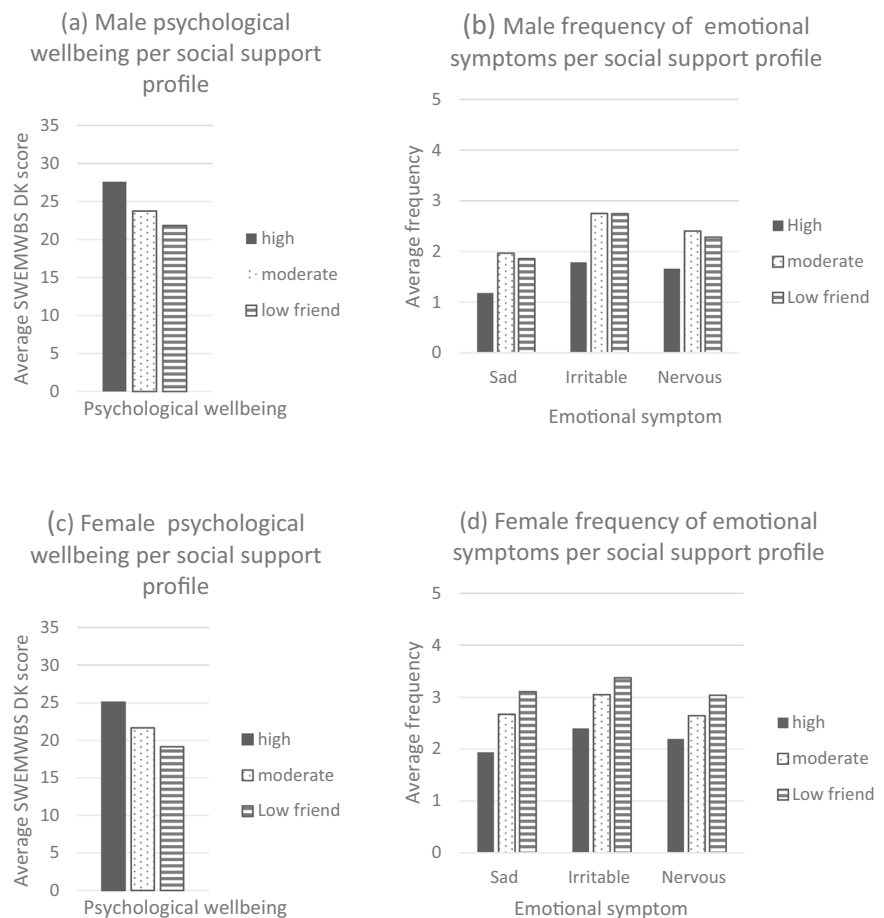
SWEMWBS DK = Danish version of the Shorter Warwick-Edinburgh Mental Wellbeing Scale

females, we demonstrated that similar patterns of perceived social support were identified for both genders, but not all profiles related to mental health in the same way. Optimal social support, indicated by the ‘high’ perceived social profile, was associated with the highest levels of psychological wellbeing and lowest frequency of symptoms for males and females, and the divergent ‘low friend’ support profile was associated with the lowest levels of psychological wellbeing for both. However, females experienced significantly higher frequency of emotional symptoms when they had ‘low friend’ support profiles compared to those with both ‘moderate’ and ‘high’ perceived social support profiles. Conversely, there was no difference in emotional symptoms between the ‘low friend’ and ‘moderate’ groups among males. These new findings suggest nuanced, gender-specific relations between perceived social support and mental health in adolescence, which may have implications for preventive intervention.

Profiles of Perceived Social Support among Male and Female Adolescents

A key aim of our study was to investigate profiles of perceived social support for males and females separately. We

Fig. 3 Bar Charts Indicating the Mean Psychological Wellbeing Scores and Frequency of Emotional Symptoms, for Males and Females by Social Support Profile. Wellbeing was measured using the Short Warwick-Edinburgh Mental Wellbeing Scale-Danish version. Charts indicate males and females with high social support profiles had the highest levels of psychological wellbeing and lowest frequency of emotional symptoms (sad, irritable, and nervous). Males and females with a ‘low friend’ support profile had the lowest levels of psychological wellbeing. Females (but not males) with this profile also had the highest frequency of emotional symptoms



identified three empirically derived and distinct profiles for each gender. The same number of profiles was identified for males and females and the *pattern* of responses for comparable perceived social support profiles was similar, therefore they were labelled in the same way; (1) ‘high’ perceived social support from all sources, (2) ‘moderate’ perceived social support from all sources and, (3) ‘low friend’ perceived social support with moderate support from others. Despite indications in the literature that males and females perceive social support to different degrees (Bokhorst et al., 2010 ; Rueger et al., 2008; 2010) the underlying perceived social support profiles were in fact very similar. Close inspection of the plots (Fig. 2) and item means for each profile (Online Resource 1) suggests some subtle differences between male and female responses although these remain observations rather than formal tests. For example, females had higher scores on the friend support items, particularly in the ‘moderate’ and ‘low friend’ profiles, when compared to males. This is consistent with previous research (e.g., Bokhorst et al., 2010) and can be explained by females typically forming closer friendships that are perceived as greater sources of support (Rudolf & Dodson, 2022; Taylor, 2011). However, in our study, males perceived higher classmate support, which was most apparent in the ‘high’ and ‘low friend’ profiles. This is in contrast to previous research that indicated that females perceive more support from classmates (Rueger et al., 2010). Disparate findings may reflect cultural or methodological differences that would require further investigation and more formal testing of those differences is required. The prevalence of the support profiles was comparable between males and females with slightly more females having ‘high’ convergent perceived support (55.5 vs 54.4% for males), fewer females having convergent ‘moderate’ perceived support (28.8 vs 31.6% for males), and more females having the ‘low friend’ support profile (15.7 vs 13.9% for males). Ciarrochi et al. (2017) found that a much higher proportion of females were classified into the high perceived social support profile compared to males, in their study of perceived social support profiles among a mixed gender sample. Relatively small difference may have been observed in the present study because gender differences were accounted for at an earlier stage by producing separate profiles for males and females.

Although the analyses were largely exploratory, we made a general prediction that both convergent and divergent profiles of perceived social support would be identified. As predicted, and in line with other person-oriented studies (e.g., Ciarrochi et al., 2017), we identified ‘high’ and ‘moderate’ perceived social support that indicated convergence in levels perceived social support from different sources. The majority of adolescents (86% males and 84% females) showed convergent profiles of support, suggesting

it is typical for young people to perceive similar levels of support from key figures in their lives. This is consistent with findings from correlational studies, which demonstrate having support from one source is often associated with support from other sources (e.g., Laursen et al., 2006). Convergence of perceived support can be explained in several ways. For example, individuals may have characteristics that enable or prevent them from developing supportive relationships. Modes of attachment, temperament, personality characteristics, and social and emotional competence may all influence an individual’s ability to develop relationships with different people (van Aken & Semon Dubas, 2004; Zimmermann, 2004). However, a young person’s environment is also important. For example, an early nurturing family environment can lead individuals to develop social competencies that enable them to access social support from others later in life. Conversely, growing up in a maladaptive environment could lead to difficulties developing and using supportive social networks (Taylor, 2011). Additional research into factors that lead to convergent profiles of perceived social support are warranted to understand those processes further.

We also found a less prevalent, divergent profile that represented similar levels of support from teachers, classmates, and family as in the moderate profile, but much lower perceived support from friends. Using cluster analysis, Scholte et al. (2001) also identified a group of adolescents with a profile that indicated high parental support, but very low friend support. Young people with this profile did not feel adequately supported by friends, which could indicate difficulty forming close friendships, rejection from peers, or a perception that support is not as good as it should be. A worthwhile area for future research would be to investigate why young people with this profile felt such low support from friends. Such research could yield useful insights to inform targeted interventions.

Other person-oriented studies have identified divergent profiles of social support that were not identified in the current study. For example, Ciarrochi et al. (2017) identified 6-profiles of perceived social support among Australian adolescents, two of which were divergent: ‘parent-peer supported’ (i.e., higher than average teacher support but very high parent and peer support) and ‘peer supported’ (i.e., low parent and teacher support but higher than average peer support). There are different possible explanations for the discrepancy. First, different sources of perceived social support were examined in the studies. For example, Ciarrochi et al. (2017) focussed on parents rather than family and did not differentiate peer support into friends and classmates. Second, Ciarrochi et al. (2017) used different criteria to select the best model. For example, in their study, the LMR-LRT indicated a 3-profile model best fit the data (as in the present study), but they selected the 6-class model

because they perceived a levelling of BIC for the 6 and 7 profile models. Further, we excluded models with profiles containing a small proportion of the sample because it was our aim to parsimoniously capture heterogeneity in perceived social support profiles. Both divergent profiles in the Ciarrochi et al. (2017) study contained less than 10% of the overall sample which could indicate unstable or sample specific profiles (Masyn, 2013) and may explain why they were not identified here, however, further work would be needed to establish the reliability of those profiles and the ones found in the present study.

Perceived Social Support Profiles and Mental Health

Another aim of our study was to investigate the relationship between perceived social support profiles and a range of mental health outcomes spanning wellbeing and symptoms of distress. In line with our prediction and previous research (Chu et al., 2010; Gariépy et al., 2016; Rueger et al. 2016), those with an optimal social support profile (indicating high perceived social support from all sources) had significantly higher psychological wellbeing and significantly lower frequency of mental health symptoms, compared to the other profiles. High perceived social support may be linked to good mental health because supportive relationships promote self-esteem and a sense of belonging, which enhances young people's psychological wellbeing (Thoits, 2011). They also provide a secure base from which individuals can explore the world therefore encouraging personal growth and allowing the individual to flourish (Feeney & Collins, 2015). Further, it is a resource young people may draw upon to cope with the stresses of adolescence, thus preventing the occurrence of mental health difficulties (Cicognani, 2011). An important next step is longitudinal research to confirm whether perceived social support profiles predict mental health over time.

The 'low friend' perceived social support profile was associated with the lowest levels of psychological wellbeing for males and females. However, in the sensitivity analyses this difference did not always reach significance for males, suggesting that this finding was more robust for females than males. Nonetheless, social support from friends appears to be important for psychological wellbeing during adolescence, even when adequate social support is available from other sources. This fits with the theory that support from friends has a promotive effect on young people's wellbeing (Keefe & Berndt, 1996; Feeney & Collins, 2015). However, when differences in emotional symptoms were examined, the 'low friend' group only differed from the 'moderate' group for females but not males. Psychopathology (i.e., symptoms) and psychological wellbeing represent distinct aspects of mental health (Iasiello & Van Ageren, 2020) and, therefore, the 'low friend' support

profile was associated with one aspect of mental health for males (i.e., reduced psychological wellbeing but not increased psychopathology), when compared to those with the 'moderate' perceived social support profile. Yet, for females, having the 'low friend' support profile was associated with both reduced wellbeing *and* increased psychopathology compared to the 'moderate' perceived social support profile, suggesting that this profile is more damaging to females' overall mental health. Research has indicated that females are more likely than males to rely on friendships for social support (Rueger et al., 2008) and to use social support as a coping mechanism (Tamres et al., 2002), suggesting that the link between social support from friends and mental distress is stronger. Further, females appear to be particularly sensitive to peer relationships, and the lack thereof, as they are more apt to worry about social approval and the status of friendships (Rose & Rudolf, 2006). Consequently, perceived lack of friendship may lead to greater emotional difficulties. In the social support literature, there have been equivocal reports regarding the importance of support from friends for adolescent mental health (Rueger et al., 2016). This may be, in part, due to the tendency to study males and females as one group, or to conflate friendship and other peer relationships. Our results suggest that lack of support from friends may be particularly detrimental for female mental health.

Owing to gender differences in mental health and perceptions of social support, and evidence that social support functions differently in males and females (Heerde & Hemphill, 2018), we predicted that different relationships between social support profiles and mental health outcomes might be indicated. Our findings suggest that optimal perceived support is associated with the best mental health outcomes for both males and females, however profiles of support indicating moderate support from teachers, classmates and family, but low support from friends, is associated with more emotional symptoms in females. This indicates a complexity in the relationship between perceived social support and mental health that would not be identified if data from males and females were aggregated, nor if perceived social support was conceptualised as a single continuous variable.

Strengths, Limitations, and Areas for Further Study

This study used a large, current, and nationally representative dataset that means the results can be generalised to the wider Danish adolescent population. Future research should test whether the same common profiles are found in different populations, and whether the same associations with mental health are identified.

By taking a person-oriented perspective, this study has been able to investigate different configurations of

perceived social support from a range of important figures in a young person's life. However, there are other possible providers of social support, for example, support from community groups, neighbours, or online communities. Future studies may wish to include a broader range of support indicators to examine whether different profiles are identified and whether they have differential relations with mental health. In addition, we examined relations between perceived social support profiles and a range of mental health indicators, covering both mental distress and well-being. This could be extended further by also investigating relations between perceived social support profiles and externalising problems. Males are more likely to express mental distress as behavioural problems rather than emotional symptoms (Deighton et al., 2019), thus further gender differences may be identified.

A limitation of this study was that analyses were necessarily cross-sectional, meaning that causal relations cannot be inferred from these results alone. Further research is required to investigate those relations longitudinally in order to understand whether perceived social support profiles predict later mental health outcomes and to examine the extent to which relations are reciprocal; good mental health may also help individuals to develop more supportive relationships in the future.

There were also some measurement limitations worth noting. First, all measures were self-reported which could lead to reporting biases. Because adolescents are particularly sensitive to their social environment and judgement from others, they may be more likely to respond in a socially desirable way and overstate their social relationships and mental health. Self-report measures were appropriate for collecting information about perceived social support, psychological wellbeing and emotional symptoms as these are internal states (De Los Reyes et al., 2015) but alternative measures could be considered in future studies in order to test whether those relationships hold when more objective measures are used, for example by using parent or teacher reports of mental health in addition to self-reports (De Los Reyes et al., 2015). Social networks could be used as a more objective measure of social support. Although the number of relationships may not necessarily translate into support, that information could be combined with information about perceptions of support in order to provide a more detailed, and less subjective account. A benefit of LPA is that multiple indicators can be included in the same analysis so different indicators (objective and subjective) could be used to form profiles. Indeed, researchers have used LPA to incorporate information about social support networks (e.g., number and quality of same and opposite sex relationships) to create social support profiles (Jager, 2011) and this could be refined further to include more detailed perceived support information. Second, the psychometric

validity of the items included in the LPA is not clear because psychometric testing is typically completed at the scale level rather than the item level. Psychometric studies that look at the validity and reliability of single items is needed. Third, this was a secondary data analysis, so we were constrained to use the social support items that were available. Items indicating social support from different sources varied and response scales were not harmonised, therefore, this could have potentially biased the way in which participants responded. However, as LPA can incorporate different indicator variables with different response scales (Muthen & Muthen, 1998–2017) and because we were interested in comparing relative differences in item-level responses across profiles (not scales), the use of unharmonised measure does not compromise the analysis. Finally, due to software limitations, some ordinal variables had to be treated as continuous to simplify the model. Where possible, future studies should try to replicate the results when responses are in their original metric.

Conclusion

Few extant studies have investigated the complex patterns of social support perceived by male and female adolescents, and their relations with mental health. This study has empirically identified profiles of perceived social support and their cross-sectional associations with mental health indicators, while controlling for grade, social class, and ethnicity. Profiles of perceived support are important because they capture heterogeneity in both the level and source of perceived social support. Furthermore, they show differential relations with mental health. The results showed that high social support profiles were most common and associated with optimal mental health for males and females. Even when moderate social support was perceived from different sources, mental health was significantly worse. When, in addition to this, support from friends was low, psychological wellbeing was significantly lower for males and females, and females experience more emotional symptoms.

These findings add to a growing body of person-oriented research that indicates that adolescents tend to perceive similar levels of support from those around them (e.g., Ciarrochi et al., 2017). Processes that lead to converging social support have been suggested, such as individual characteristics and competencies (van Aken & Semon Dubas, 2004; Zimmermann, 2004) and early experiences (Taylor, 2011). Focussing on those mechanisms may prove important for helping young people to develop supportive relationships with key figures in their life. Findings are in line with variable-oriented research, and the coping and resilience literature, which suggests that strong social

support can improve and protect adolescent mental health (Taylor, 2011). Therefore, interventions that effectively improve social support may have a positive influence on young people's mental health.

This study also highlighted a significant minority of young people who perceived low support from friends, despite observing moderate support from others. Considering the prevalence of this group and links with poor mental health, further work is needed to find out more about those young people; why they perceive such low levels of support from friends, whether this is a persistent or transient state, and how they can be helped. Having a 'low friend' support profile was associated with more emotional difficulties for females but not males. We know that the prevalence of emotional symptoms in adolescence is higher in females than males (Deighton et al., 2019) and that problems often persist into adulthood (Kim-Cohen et al., 2003). Therefore, it is particularly important to identify females without the social resources to prevent symptoms from developing in order to enable effective targeted intervention efforts and reduce the gender gap in emotional symptoms.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s10826-023-02677-y>.

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Compliance with Ethical Standards

Conflict of Interest The authors declare no competing interests.

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