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Published in:
Journal of Sex Research

DOI:
10.1080/00224499.2024.2319245

Publication date:
2024

The Journal of Sex Research

ISSN: (Print) (Online) Journal homepage: www.tandfonline.com/journals/hjsr20

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To cite this article: Wouter J. Kiekens, Tessa M. L. Kaufman, Laura Baams, Jennifer de Lange, Margreet E. de Looze, Gonneke W. J. M. Stevens & H. M. W. Bos (26 Feb 2024): A Latent Profile Analysis of Social Support, Online Contacts, and Preference for Online Communication Among Same- and Both-Sex Attracted and Other-Sex Attracted Adolescents, The Journal of Sex Research, DOI: 10.1080/00224499.2024.2319245

To link to this article: https://doi.org/10.1080/00224499.2024.2319245

Published online: 26 Feb 2024.

THE JOURNAL OF SEX RESEARCH
https://doi.org/10.1080/00224499.2024.2319245

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A Latent Profile Analysis of Social Support, Online Contacts, and Preference for Online Communication Among Same- and Both-Sex Attracted and Other-Sex Attracted Adolescents

Wouter J. Kiekens[a], Tessa M. L. Kaufman[b], Laura Baams[c], Jennifer de Lange[c], Margreet E. de Looze[d], Gonneke W. J. M. Stevens[d], and H. M. W. Bos[e]

[a]Department of Sociology/Interuniversity Center for Social Science Theory and Methodology (ICS), University of Groningen; [b]Department of Education and Pedagogy, Utrecht University; [c]Department of Pedagogy and Educational Sciences, University of Groningen; [d]Department of Interdisciplinary Social Science, Utrecht University; [e]Department of Child Development and Education, University of Amsterdam

ABSTRACT

This study aimed to assess differences between other-sex attracted and same- and both-sex attracted adolescents in profiles of peer and family social support, online contacts, and preferences for online communication. Data stem from the 2017 Dutch "Health and Behavior in School-Aged Children" (HBSC) survey ($N = 6{,}823$; 4.0% same- and both-sex attracted; M age=14.73, $SD = 1.59$, range = 12–18). We conducted latent profile analyses to estimate profiles in peer and family social support, online contacts, and preferences for online communication. Then we assessed the association between sexual attraction and profile membership. A five-profile solution fitted the data best. Profiles were characterized as *high support, online contact, and average online communication preference* (35.6%); *high support, low online contact, and weak online communication preference* (42.9%); *average support, high online contact, and strong online communication preference* (9.9%); *low support, low online contact, and average online communication preference* (6.9%); and *low support, average online contact, and average online communication preference* (5.0%). Same- and both-sex attracted adolescents had higher odds than other-sex attracted adolescents of being in the latter three profiles than in the first profile. Thus, same- and both-sex attracted adolescents were more likely to report average to low rates of peer and family social support, high to low frequency of online contact, and an average to strong preference for online communication than other-sex attracted adolescents. The average to low levels of support especially influenced these sexual orientation-based differences in profile membership.

Introduction

Research often finds that same- and both-sex attracted adolescents report poorer relationship quality with peers and parents than other-sex attracted adolescents (Diamond & Lucas, 2004; Hatzenbuehler et al., 2012; Kiekens et al., 2020). As a result, they might receive less social support in their immediate social environment. Following the diversification hypothesis, marginalized groups are more likely to use online resources or contacts to access resources to compensate for their lack of offline social capital (Mesch, 2012). From this perspective, one would expect that same- and both-sex attracted adolescents are more likely to use online resources or contacts than their other-sex attracted peers. More specifically, same- and both-sex attracted adolescents may substitute the lack of support from peers and parents with online contacts (Baams et al., 2011; Hillier et al., 2012; Martin-Storey et al., 2021). Because same- and both-sex attracted adolescents may be more likely to seek social support online, they might also have more contact with friends online than their other-sex attracted peers and have stronger preferences for online communication than their other-sex attracted peers.

Remarkably, however, little is known about how same- and both-sex attracted adolescents combine peer and family support, online contacts, and preferences for online communication and to what extent this differs from other-sex attracted adolescents. Studying profiles in peer and family support, online contacts, and preferences for online communication provides a better understanding of how same- and both-sex attracted adolescents adapt to potentially adverse social climates. This knowledge could inform whether and how (i.e., online or offline) interventions should reach out to same- and both-sex attracted adolescents. Therefore, the aim of the present study was to assess differences between other-sex attracted and same- and both-sex attracted adolescents in profiles of peer and family social support, online contacts, and preferences for online communication.

Family and Peer Social Support

In general, research has pointed to differences in social support between same- and both-sex attracted and other-sex attracted adolescents. For instance, same- and both-sex attracted youth reported lower mean levels of parental support (Watson et al.,

CONTACT Wouter J. Kiekens w.j.kiekens@rug.nl Department of Sociology/Interuniversity Center for Social Science Theory and Methodology (ICS), University of Groningen, Grote Rozenstraat 31, Groningen 9712 TG, The Netherlands

2016) and peer support (Perales & Campbell, 2020) than other-sex attracted youth. These differences in reported social support might stem from same- and both-sex attracted adolescents not receiving sexuality-specific support. This can be understood as supportive behaviors toward a same- and both-sex attracted person after learning about their non-normative identity or after becoming aware of nonnormative behaviors that could be attributed to someone's sexual orientation (Abreu et al., 2022). Sexuality-specific support might not always be available in one's immediate environment from peers or family, for instance, when family or friends have difficulties accepting the adolescent's (presumed) sexual orientation. This might lead to same- and both-sex attracted adolescents reporting lower levels of overall social support than other-sex attracted adolescents. Additionally, a different reason for different rates of support is that same- and both-sex attracted adolescents report more adverse childhood experiences (Clements-Nolle et al., 2018) and peer victimization (Kaufman et al., 2020) from family and straight peers, which could result in less support.

When appropriate support is not available in their immediate social environment, same- and both-sex attracted adolescents might turn to *online* sources of support. In general, research among college students suggests that online environments are an important source of social support, especially for those who receive less offline support (Cole et al., 2017), which might be the case for same- and both-sex attracted adolescents. Indeed, in a qualitative study, sexual and gender minority adolescents in rural areas indicated that they utilized social media to access sexual orientation or gender identity-related support (Paceley et al., 2022). Further, same- and both-sex attracted adolescents were more likely to have met a friend online than their other-sex attracted peers and online friends provided more relevant support than offline friends for same- and both-sex attracted adolescents (Ybarra et al., 2015). Among same- and both-sex attracted youth, online environments were identified as especially important spaces for building community and were perceived as more supportive than offline environments (McInroy et al., 2019). One could, therefore, suggest that same- and both-sex attracted adolescents might not always have access to offline peer and family social support and, consequently, are more likely to seek contacts online and receive support from online contacts. These contacts might substitute offline peer support, leading to less pronounced differences in peer support between same- and both-sex attracted and other-sex attracted adolescents.

Frequency of Online Contact and Preferences for Online Communication

Because same- and both-sex attracted adolescents might be more likely to seek social support online, they might also have more contact with friends online than their other-sex attracted peers. In line with this, same- and both-sex attracted US youth more often use social networking sites for social communication than their other-sex attracted peers (Ceglarek & Ward, 2016). Further, research found that same- and both-sex attracted adolescents are more likely to have met friends online than other-sex attracted adolescents (Ybarra et al., 2015) and report more contact with people they met online (Huijnk & van Beusekom, 2021). A qualitative study found that same- and both-sex attracted youth were more open to meeting people online than other-sex attracted youth (Hillier et al., 2012). Notably, however, one study found no sexual orientation-based differences in being friends online with people that adolescents had never met (Charmaraman et al., 2021), although same- and both-sex attracted adolescents more often joined groups online to feel less alone than their other-sex attracted peers.

The higher frequency of online contact might also come with a stronger preference for online communication among same- and both-sex attracted adolescents, especially considering that online environments can, compared to offline environments, provide a (safer) place for identity exploration and expression and can be a source for finding partners (Ceglarek & Ward, 2016). In line with this, Dutch same- and both-sex attracted adolescents prefer online communication more when talking about their feelings, secrets, or worries online than other-sex attracted adolescents (Huijnk & van Beusekom, 2021). We are unaware of research directly assessing with whom same- and both-sex attracted adolescents have frequent contact or their preferences for online contact, especially in combination with peer and family social support. Doing so would provide insight into how same- and both-sex attracted adolescents adapt to an adverse social climate and could inform intervention programs on how to support same- and both-sex attracted adolescents better.

The Present Study

This study examined differences between other-sex attracted and same- and both-sex attracted adolescents in profiles of peer and family social support, online contacts, and preferences for online communication. To assess combined patterns in peer and family social support, online contacts, and preferences for online communication, we estimated profiles of these characteristics. We expected to find several profiles but, based on previous research (e.g., Baams et al., 2011; Cole et al., 2017; Hillier et al., 2012; Huijnk & van Beusekom, 2021), at least one with average levels of peer social support, low levels of family social support, more contact with friends met online, and a stronger preference for online communication. We hypothesized that same- and both-sex attracted adolescents were more likely to be part of such a profile than other-sex attracted adolescents.

Method

Procedure

Data stem from the 2017 Dutch "Health and Behavior in School-Aged Children" (HBSC) survey. The Dutch HBSC survey is a nationally representative cross-sectional study conducted every four years since 2001. A two-stage random sampling procedure was used (Stevens et al., 2018). First, a random sample of Dutch schools providing primary and secondary education in the Netherlands was obtained, excluding special education schools. The selection of schools was stratified based

on urbanization level. For the current study, only data from secondary school students were used ($n = 6,823$). Secondly, each participating school provided a list of all classes, of which three to five classes were randomly selected (the number of classes depended on school size). All students were drawn as a single cluster within the selected classes. The response rate among schools was 37%, and the response rate among adolescents was 92%. Participants were informed of their anonymity and provided active consent, while their parents gave passive consent. Ethics approval was gained from the Ethics Assessment Committee of the Faculty of Social Sciences at Utrecht University (FETC17–079 in 2017). Some participants were younger than 12 and older than 18, the typical age range during which Dutch adolescents attend secondary education. Therefore, participants were omitted ($n = 128$) if they were younger than 12 years old or 19 years and older (we chose 19 as the cut off to include participants who turned 18 during the last year of secondary education). Some participants ($n = 440$) were unsure about their sexual attraction. This indicates either that participants had not felt sexual attraction yet, or that they were questioning their current attraction. Because of this heterogeneity, participants who were unsure about their sexual attraction were omitted from analyses as well. The final sample comprised $N = 6,823$ participants.

Variables

Sexual Attraction

To determine participants' sexual attraction, questions on gender/sex and sexual attraction were used. For gender/sex, participants were asked "Are you a boy or a girl?" with answer options 0 = *Boy* and 1 = *Girl*. For sexual attraction, participants were asked "Are you attracted to boys, girls, or both?" with answer categories 1 = *I am attracted to boys*, 2 = *I am attracted to girls*, 3 = *I am attracted to boys and girls*, and 4 = *I am not sure yet*. Participants who reported other-sex attraction were coded as 0 = *Other-sex attracted* and those who reported same-sex attraction or both-sex attraction were coded as 1 = *Same- and both-sex attracted*. Data from those who were unsure about their sexual attraction were omitted from the analyses.

Peer and Family Support

To measure peer and family support, we used the family and friend subscales of the Multidimensional Scale of Perceived Social Support (MSPSS; Zimet et al., 1988). The MSPSS is a valid and reliable scale to measure social support among adolescents (Canty-Mitchell & Zimet, 2000). Both peer support (e.g., "My friends really try to help me") and family support (e.g., "Family members really try their best to help me") were measured using four questions with answer options ranging from 1 = *Totally disagree* to 7 = *Totally agree*. The mean score of these four questions was calculated for both peers and family, where higher scores reflected more support (α peers = .93; α parents = .93).

Online Contact

Participants first read an introductory text in which they were informed that the following questions were about online contact and communication, and they were given some examples of such contact and communication. Then, they were asked "How often do you have online contact with the following people?" They had to indicate for their close friends, friends from a larger friend group, friends met through the internet, and people other than friends (e.g., siblings, classmates, and teachers) how frequently they had online contact with them. Answer options were 0 = *I don't know/does not apply*, 1 = *(almost) Never*, 2 = *At least every week*, 3 = *(almost) Every day*, 4 = *Several times a day*, and 5 = *During the entire day*. *I don't know/does not apply* was coded as missing (n close friends = 126; n friends from a larger friend group = 409; n friends met through the internet = 3,195; n other = 454). The questions on close friends and friends met through the internet have been previously validated (Mascheroni & Ólafsson, 2014).

Preference for Online Communication

We used three items from the Perceived Depth of Online Communication Scale to measure participants' preferences for online communication (Peter & Valkenburg, 2006). Depth of communication refers to the extent that people experience online communication as more effective than offline communication when disclosing intimate or personal information. Participants were asked "It is easier to talk about secrets on the internet than in real life", "It is easier to talk about my feelings on the internet than in real life", and "It is easier to talk about my worries on the internet than in real life". Answer options ranged from 1 = *Totally disagree* to 5 = *Totally agree*. The mean score of these three questions was calculated, where higher scores reflected a stronger preference for online communication (α = .92).

Covariates

Participants' age was assessed, as well as their gender/sex. Participants were considered 0 = *Native* when both participants' parents were born in the Netherlands and 1 = *Non-native* when at least one of their parents was born outside of the Netherlands. The Dutch secondary education system differentiates between several educational levels (Nuffic, n.d.), where lower levels have a duration of 4 years and prepare students for secondary vocational education and higher levels have a duration of 5 to 6 years and prepare students for higher professional education or university. An education variable was created and coded as 0 = *Lower pre-vocational education*, 2 = *Higher pre-vocational education*, 3 = *Higher general education*, and 4 = *Pre-scientific education*. Last, we assessed family affluence using the Family Affluence Scale (Currie et al., 1997). Participants were asked to answer six questions on affluence in their family (e.g., "Does your family own a car, van, or truck?"). A sum score was calculated and recoded as 0 = *Low*, 1 = *Middle*, and 2 = *High* FAS based on scoring procedures from HBSC (Torsheim et al., 2016).

Analytic Strategy

We used a latent profile analysis (LPA) to estimate profiles in peer and family social support, online contacts, and preferences for online communication in Mplus version 8.3 to fit one-through-ten profile models to the data (Muthén &

Muthén, 2017). Several fit indices were used to assess the model fit and to choose the best-fitting model. First, the log-likelihood, Akaike's Information Criterion (AIC), and sample size adjusted Bayesian Information Criterion (Adj BIC) were inspected, where lower values indicated a better fit to the data. Second, the Vuong-Lo-Mendell-Rubin likelihood ratio test (VLMR) and the Lo-Mendell-Rubin likelihood ratio test (LMR) were inspected. Here, significant *p*-values indicate that the current model better fit the data compared to a k-1 profile model. Third, the interpretability of the profiles was considered. Last, the Entropy, where a value closer to one reflects a better classification of participants, was used as well.

Then, using the best-fitting LPA solution, we assessed the association between sexual attraction and profile membership using a 3-step LPA procedure (Asparouhov & Muthén, 2014; Feingold et al., 2014). This approach uses a multinomial logistic regression framework to assess the associations between variables of interest (sexual attraction) and profile membership compared to a reference profile while accounting for measurement error when introducing covariates to the model. To account for missing variables, we used the IMPUTATION function in Mplus. Only sexual attraction, age, gender/sex, immigration status, educational background, and family affluence were imputed. For the variables involved in estimating the latent profiles, full information maximum likelihood (FIML) was used.

Despite the nested structure of the data (students nested in classrooms nested in schools), we did not perform multilevel analyses. The intraclass correlation (ICC), referring to the percentage of variance at the individual level that can be explained by the classroom or school level, was low for all outcome variables. At the classroom level, the ICC of peer and family social support, online contacts, and preferences for online communication ranged from .01 to .02 and at the school level the ICC ranged from .003 to .03. The design effect, understood as the misestimation of the standard errors when the clustering would be ignored (Stapleton & Kang, 2018), was relatively low as well. At the classroom level, the design effect based on the average cluster size ranged from 1.14 to 1.46; at the school level, it ranged from 1.24 to 2.98. Clustering is suggested to be ignored when the ICC < .10 (Vajargah & Nikbakht, 2015) and the design effect < 2 (Lai & Kwok, 2015). Considering this, and that outcomes of LPAs were similar in analyses where we did not adjust for clustering, we chose a more parsimonious model by not considering the clustering in our analyses.

Results

Differences by Sexual Attraction

Table 1 portrays differences in variables under study by sexual attraction. Same- and both-sex attracted participants reported significantly less peer and family support than other-sex attracted participants. Further, same- and both-sex attracted adolescents reported more online contact with friends met through the internet, less online contact with people other than friends, and stronger preferences for online communication than other-sex attracted participants.

Outcomes of Latent Profile Analyses

We tested for one-through-ten profile solutions (see Table 2). The log-likelihood, AIC, and Adj BIC decreased for every profile solution and they were lowest for the 10-profile solution. Until the fourth-profile solution, the change in log-likelihood,

Table 1. Descriptive statistics ($N = 6{,}823$).

Variables	Complete sample *M* (*SD*)/%	Other-sex attracted *M* (*SD*)/%	Same- and both-sex attracted *M* (*SD*)/%	*p*	Min – Max	% missing
Sexual attraction						2.9
Other-sex attracted	93.1%					
Same-sex attraction	1.6%					
Both sex attraction	2.4%					
Peer support	5.78 (1.33)	5.79 (1.32)	5.54 (1.45)	.002	1.00—7.00	0.2
Family support	6.02 (1.34)	6.05 (1.32)	5.37 (1.66)	<.001	1.00—7.00	0.2
Online contact						
Close friends	3.73 (1.06)	3.73 (1.05)	3.70 (1.16)	.569	1.00—5.00	1.8
Friends from a larger friend group	2.84 (1.21)	2.84 (1.21)	2.78 (1.22)	.420	1.00—5.00	6.0
Friends met through the internet	2.03 (1.27)	1.99 (1.24)	2.58 (1.47)	<.001	1.00—5.00	46.8
People other than friends	2.90 (1.22)	2.91 (1.22)	2.71 (1.25)	.007	1.00—5.00	6.7
Preference for online communication	2.10 (1.13)	2.07 (1.12)	2.66 (1.26)	<.001	1.00—5.00	1.2
Age	14.73 (1.59)	14.74 (1.60)	15.22 (1.58)	<.001	12.00—18.98	0.0
Gender/sex				<.001		0.0
Boy	49.3%	49.5%	38.9%			
Girl	5.7%	50.5%	61.1%			
Migration background				.140		0.01
Native	78.8%	79.9%	75.3%			
Non-native	21.2%	21.0%	24.7%			
Education level				.166		0.0
Lower pre-vocational education	15.8%	15.5%	14.2%			
Higher pre-vocational education	27.9%	27.7%	27.3%			
Higher general education	26.5%	26.7%	22.5%			
Pre-scientific education	29.9%	30.1%	36.0%			
Family affluence				.002		2.5
Low	9.1%	9.1%	14.9%			
Middle	47.7%	48.9%	50.2%			
High	4.7%	42.1%	34.9%			

Table 2. Fit statistics for latent profile analyses.

	LL	Change in LL[a]	AIC	Change in AIC[a]	Adj BIC	Change in Adj AIC[a]	VLMR	LMR	Entropy	Min-Max *n*
1 profile	−70,210.27		140,448.54	–	140,499.64	–	–	–	–	–
2 profiles	−68,127.40	−2,082.87	136,298.80	4,149.74	136,379.10	4,120.54	<.001	<.001	.95	688–6,135
3 profiles	−66,772.59	−1,354.81	133,605.18	2,693.62	133,714.68	2,664.42	<.001	<.001	.76	625–3,966
4 profiles	−66,079.25	−693.34	132,234.51	1,370.67	132,373.22	1,341.46	<.001	<.001	.78	350–2,671
5 profiles	**-65613.68**	**−465.57**	**131,319.35**	**915.16**	**131,487.27**	**885.95**	**<.001**	**<.001**	.81	**343–2,924**
6 profiles	−65,168.58	−445.10	130,445.15	874.20	130,642.27	845.00	<.001	<.001	.80	189–2,861
7 profiles	−64,778.28	−390.30	129,680.56	764.59	129,906.88	735.39	<.001	<.001	.82	165–2,755
8 profiles	−64,485.50	−292.78	129,111.01	569.55	129,366.53	540.35	<.001	<.001	.79	169–2,845
9 profiles	−64,245.50	−240.00	128,647.01	464.00	128,931.73	434.80	.02	.03	.79	124–2,537
10 profiles	−64014.96	−230.54	128201.91	445.10	128,515.84	415.89	.03	.03	.80	132–2,612

LL, Log Likelihood; AIC, Akaike's Information Criterion; Adj BIC, adjusted Bayesian Information Criterion; VLMR Vuong-Lo-Mendell-Rubin likelihood ratio test; LMR, Lo-Mendell-Rubin likelihood ratio test.
[a]Change compared to the k-1 class.

AIC, and Adj BIC halved for every additional profile. Thus, from the fifth profile onwards improvements in the log-likelihood, AIC, and Adj BIC leveled off, pointing to the 5-profile solution best fitting the data. The VLMR and LMR both remained significant for all profile solutions. This indicated that every model's fit was better than the previous model. The Entropy was highest for the 5-profile solution. Further, the 5-profile solution yielded a clear interpretation. Considering this, we deemed the 5-profile solution best fit the data.

Table 3 presents the mean scores on peer and family social support, online contacts, and preferences for online communication for the four profiles, and a visual representation is given in Figure 1. Participants in the first (35.6.%) profile reported (compared to the other profiles) higher peer and family support, higher online contact with close friends, friends from a larger friend group, and people other than friends. They also reported average online contact with friends met through the internet and average preference for online communication. This group can be classified as *high support, online contact, and average online communication preference*. Participants in the second profile (42.9%) reported (compared to the other profiles) somewhat higher peer support, higher family support, lower online contact with close friends, friends from a larger friend group, friends met through the internet, and people other than friends. They also reported a weaker preference for online communication. This group was classified as having *high support, low online contact, and weak online communication preference*. Participants in the third profile (9.9%) reported (compared to the other profiles) average peer and family support, somewhat higher online contact with close friends and friends from a larger friend group, average online contact with friends met through the internet and people other than friends, and a stronger preference for online communication. This group can thus be classified as having *average support, high online contact, and strong online communication preference*. Participants in the fourth profile (6.9%) reported (compared to the other profiles) somewhat lower peer and family support, lower online contact with close friends, friends from a larger friend group, friends met through the internet, and lowest online contact with people other than friends, and average preference for online communication. This group can thus be classified as having *low support, low online contact, and average online communication preference*. Last, participants in the fifth profile (5.0%) reported (compared to the other profiles) lower peer and family support, average online contact with close friends, friends from a larger friend group, friends met through the internet, and people other than friends, and an average preference for online communication. This group can thus be classified as having relatively *low support, average online contact, and average online communication preference*.

Predicting Profile Membership

Table 4 displays the outcomes of the multinominal regression predicting profile membership. Compared to their other-sex attracted peers, same- and both-sex attracted participants had higher odds of being in the *average support, high online contact, and strong online communication preference* profile than in the *high support, online contact, and average online communication preference* profile (OR = 3.54; 95% CI [1.93, 4.81]).

Table 3. Description of latent profiles analysis with 5 profiles.

	High support, online contact, and average online communication preference (*n* = 2,432)		High support, low online contact, and weak online communication preference (*n* = 2,924)		Average support, high online contact, and strong online communication preference (*n* = 675)		Low support, low online contact, and average online communication preference (*n* = 449)		Low support, average online contact, and average online communication preference (*n* = 343)	
	M (SE)	95% CI	*M (SE)*	95% CI	*M (SE)*	95% CI	*M (SE)*	95% CI	*M (SE)*	95% CI
Peer support	6.32 (0.02)	[6.28, 6.36]	5.77 (0.04)	[5.69, 5.84]	5.68 (0.06)	[5.56, 5.80]	4.48 (0.17)	[4.15, 4.81]	4.10 (0.16)	[3.79, 4.42]
Family support	6.65 (0.02)	[6.62, 6.68]	6.56 (0.02)	[6.53, 6.60]	4.65 (0.11)	[4.43, 4.86]	4.57 (0.13)	[4.32, 4.83]	1.80 (0.07)	[1.65, 1.94]
Online contact										
Close friends	4.43 (0.02)	[4.39, 4.47]	3.18 (0.06)	[3.07, 3.29]	4.33 (0.07)	[4.20, 4.47]	2.62 (0.17)	[2.28, 2.95]	3.72 (0.09)	[3.55, 3.90]
Friends from a larger friend group	3.77 (0.07)	[3.63, 3.91]	2.06 (0.03)	[2.00, 2.12]	3.34 (0.13)	[3.08, 3.61]	1.75 (0.08)	[1.60, 1.91]	2.91 (0.09)	[2.73, 3.09]
Friends met through the internet	2.32 (0.06)	[2.21, 2.43]	1.60 (0.03)	[1.54, 1.65]	2.50 (0.13)	[2.24, 2.75]	1.66 (0.07)	[1.53, 1.80]	2.26 (0.10)	[2.06, 2.46]
People other than friends	3.46 (0.04)	[3.39, 3.53]	2.57 (0.04)	[2.49, 2.64]	2.87 (0.09)	[2.70, 3.04]	2.07 (0.07)	[1.93, 2.21]	2.80 (0.09)	[2.63, 2.96]
Preference for online communication	2.11 (0.03)	[2.05, 2.17]	1.88 (0.02)	[1.83, 1.92]	2.84 (0.08)	[2.68, 3.00]	2.22 (0.07)	[2.09, 2.35]	2.26 (0.08)	[2.11, 2.41]

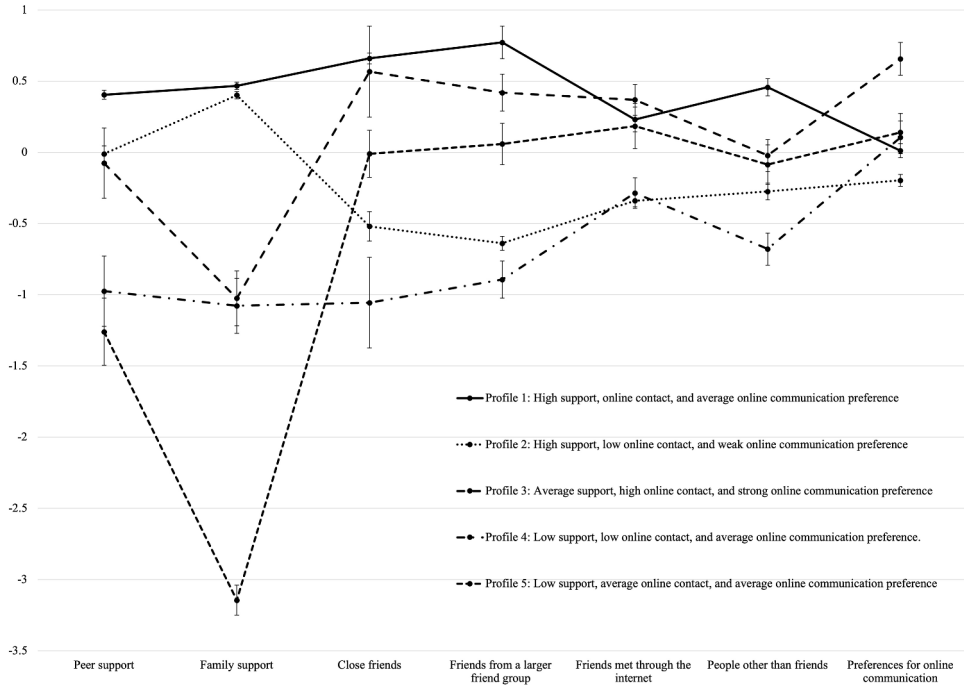

Figure 1. Visual representation of latent profile analysis with 5 profiles. Because of the different ranges of the variables, standardized values are presented.

Table 4. Multinomial regression analyses with profile membership as outcome.

	High support, low online contact, and weak online communication preference		Average support, high online contact, and strong online communication preference		Low support, low online contact, and average online communication preference		Low support, average online contact, and average online communication preference	
	Odds ratio	95% CI	Odds ratio	95% CI	Odds ratio	95% CI	Odds ratio	95% CI
Sexual attraction (Ref = Other-sex attracted)								
Same- and both-sex attracted	1.07	[0.68, 1.66]	**3.05**	[1.93, 4.81]	**2.74**	[1.59, 4.72]	**2.85**	[1.74, 4.65]
Age	**0.92**	[0.88, 0.97]	**1.21**	[1.13, 1.29]	0.98	[0.90, 1.07]	**1.18**	[1.09, 1.27]
Gender/sex (Ref = boy)								
Girl	**0.61**	[0.53, 0.71]	1.15	[0.92, 1.43]	**0.45**	[0.35, 0.58]	0.86	[0.67, 1.09]
Migration background (Ref = native)								
Non-native	**0.75**	[0.62, 0.90]	1.15	[0.89, 1.48]	1.27	[0.96, 1.68]	1.31	[0.99, 1.72]
Education level Ref = lower pre-vocational education)								
Lower pre-vocational education	1.16	[0.92, 1.46]	0.72	[0.50, 1.02]	1.08	[0.76, 1.55]	0.77	[0.56, 1.06]
Higher pre-vocational education	**1.39**	[1.09, 1.76]	1.30	[0.94, 1.81]	1.04	[0.71, 1.52]	**0.55**	[0.38, 0.79]
Higher general education	**1.67**	[1.32, 2.12]	0.89	[0.64, 1.26]	0.89	[0.60, 1.32]	**0.41**	[0.28, 0.60]
Family affluence (Ref = low)								
Middle	0.99	[0.75, 1.31]	0.84	[0.57, 1.23]	**0.66**	[0.45, 0.97]	**0.55**	[0.38, 0.80]
High	**0.65**	[0.49, 0.86]	**0.67**	[0.45, 0.99]	**0.35**	[0.23, 0.54]	**0.50**	[0.34, 0.74]

Bold number indicate $p < .05$.
[a]*High support, online contact, and average online communication preference* is the reference profile.

Same- and both-sex attracted participants also had higher odds of being in the *low support, low online contact, and average online communication preference* profile than in the *high support, online contact, and average online communication preference* profile (OR = 2.74; 95% CI [1.59, 4.72]) than other-sex attracted participants. Last, same- and both-sex attracted participants had higher odds of being in the *low support, average online contact, and average online communication preference* profile than in the *high support, online contact, and average online communication preference* profile (OR = 2.85; 95% CI [1.74, 4.65]). Together, same- and both-sex attracted participants were more likely to be part of profiles with average to lower peer and family support; high to low online contact with close friends, friends from a larger friend group, and people other than friends; higher online contact with friends met through the internet; and a strong to average preference for online communication.

Discussion

Our study aimed to examine differences between same- and both-sex attracted adolescents and other-sex attracted adolescents in profiles of peer and family social support, online contacts, and preferences for online communication. We found five distinct profiles: a *high support, online contact, and average online communication preference* profile; a *high support, low online contact, and weak online communication preference* profile; an *average support, high online contact, and*

strong online communication preference profile; a *low support, low online contact, and average online communication preference* profile; and a *low support, average online contact, and average online communication preference* profile.

We expected that same- and both-sex attracted adolescents would be more likely than their other-sex attracted peers to be part of a profile characterized by average levels of peer social support, lower levels of family social support, more contact with friends met online, and a stronger preference for online communication. However, we did not find this. Same- and both-sex attracted adolescents were more likely to be part of three profiles than their other-sex attracted peers. The first profile was characterized as *average support, high online contact, and strong online communication preference*. The second profile was characterized *low support, low online contact, and average online communication preference*. The third profile was characterized as *low support, average online contact, and average online communication preference*. The average to low levels of peer and family social support made these three profiles particularly distinct from the other profiles. Thus, mainly the lower levels of peer and family support seem to have influenced that same- and both-sex attracted adolescents were more likely to be part of these two profiles than other-sex attracted adolescents instead of the levels of online contact and online communication preferences. This is not in line with expectations from the diversification hypothesis (Mesch, 2012), as this hypothesis would predict that same- and both-sex attracted adolescents would be more likely to use online resources or contacts than their other-sex attracted peers. These findings do echo research findings of poorer relationship quality with peers and parents for same- and both-sex attracted adolescents than their other-sex attracted peers (Diamond & Lucas, 2004; Hatzenbuehler et al., 2012; Kiekens et al., 2020).

Two of the three profiles of which same- and both-sex attracted adolescents were more likely to be part of were characterized by a high frequency of online contact with friends met through the internet and average to strong preferences for online communication. This is in line with previous research that found more positive attitudes toward online communication among same- and both-sex attracted youth than among other-sex attracted youth (Hillier et al., 2012; Ybarra et al., 2015). However, we also found that there seems to be a large group of other-sex attracted adolescents that report a similar frequency of online contact with friends met through the internet and preferences for online communication. Considering that previous studies on sexual identity-based differences in attitudes toward internet use are relatively old (Hillier et al., 2012; Ybarra et al., 2015) and that social media use is more common now among all youth (Pew Research Center, 2022), it could be that youth in general now have preferences for online friends and communication and that other-sex attracted adolescents have become more similar to same- and both-sex attracted adolescents in this respect.

That some same- and both-sex attracted adolescents reported average to low peer support and simultaneously a higher frequency of online contact with friends met through the internet and an average to strong preference for online communication could be interpreted in two ways. On the one hand, having a non-supportive environment might increase the need for online (supportive) contacts, evidenced by the higher frequency of online contact with friends met through the internet and the average to strong preference for online communication. Here we assume that peer support was interpreted as lower *offline* peer support and that contact with online friends and a stronger preference for online communication were indicative of having supportive online friends. In line with these findings, a mixed methods study indicated that, when not available in their immediate environment, sexually and gender diverse youth sought friends and romantic partners online (Dehaan et al., 2013). Similarly, a qualitative study found that sexually and gender diverse people find or create online spaces in which they can safely express their identity (Devito et al., 2018).

On the other hand, reporting average to low rates of peer support while also reporting a higher frequency of online contact with friends met through the internet and an average to strong preference for online communication could indicate that these online contacts do not increase social support. This is in line with research that found that 10.5% to 71.3% of sexually and gender diverse youth face cyberbullying (Abreu & Kenny, 2018), even within online safe spaces for sexually and gender diverse youth (Berger et al., 2021). Additionally, online contacts could be more fleeting or less emotionally meaningful than offline contacts, which could limit the support of online contacts. Here we assume that participants interpreted peer support as *offline and online* peer support. However, both interpretations are speculative. Future research should therefore aim to differentiate between online and offline sources of social support and how these influence each other. It could for example be that some sources of online support depend on offline support. Compensating a lack of offline support with online support would then only be partially possible. Additionally, we need a better understanding of the content and quality of online contacts, especially considering the importance of social media in the lives of adolescents (Pew Research Center, 2022).

Of note, one the profiles of which same- and both-sex attracted adolescents were more likely to be part was characterized by lower rates of online communication with friends met through the internet. This might indicate that some same- and both-sex attracted adolescents are not able to find community online and, based on the lower rates of peer and family support, offline. This might be an especially vulnerable group to experience mental health problems and a relevant group for interventions to reach.

The findings of the present study primarily indicate that same- and both-sex attracted adolescents report average to lower social support by peers and family than other-sex attracted adolescents and are more similar in their frequency of online communication and their preferences for online communication. These findings have some important implications. Even in a country with high social acceptance of sexual diversity such as the Netherlands (Huijnk, 2022), same- and both-sex attracted adolescents receive less social support than their other-sex attracted peers. These findings are pressing, considering how peer and family support might benefit same- and both-sex attracted adolescents' mental health

(McDonald, 2018). The lack of offline social support does not seem to be compensated by online communication, as same- and both-sex attracted adolescents did not report higher rates of social support by peers and family than other-sex attracted adolescents. A better understanding of how to increase social support in same- and both-sex attracted people's lives is therefore an important avenue for future research.

Further, our findings have two implications for intervention programs addressing, for instance, mental health among same- and both-sex attracted youth. First, same- and both-sex attracted adolescents are active online and have a preference for online communication, indicated by the average scores on online contact and the strong to average scores on online communication preference. Intervention programs may consider this when reaching out to same- and both-sex attracted adolescents and may point to online (social) resources to receive support. Second, it is important that intervention programs consider the lower levels of peer and family social support, especially because this does not seem to be compensated by online communication. For peer support, it is vital to create supportive environments in offline social contexts that same- and both-sex attracted adolescents' traverse, such as gender and sexuality alliances in schools (Poteat et al., 2020). Family support is important to consider in interventions because family social support is a known protective factor against negative health outcomes (McDonald, 2018).

Limitations

An important limitation of the present study is that we assumed that same- and both-sex attracted adolescents may seek online contacts and have a stronger preference for online communication because they experience a lack of peer and family support offline. No support for this assumption was found in the present study. Although our expectations were based on previous literature, we were not able to test why we found the current patterns in peer and family social support, online contacts, and preferences for online communication, because the reasons for online contact and preferences for online communication were not assessed. Data on the reasons for online communications and the rationales behind certain preferences is needed to test the validity of our assumptions.

Further, a different limitation of the present study concerns the measure of sexual attraction. The current measure had four answer categories (i.e., I am attracted to boys, I am attracted to girls, I am attracted to boys and girls, and I am not sure yet). This measure is limited as it does not include the extent to which adolescents experience attraction. Future research should therefore include the recommended options "mostly attracted to boys" and "mostly attracted to girls", as well as an option for adolescents who do not experience sexual attraction or experience attraction regardless of gender (The Williams Institute, 2009). Second, there was a relatively low number of same- and both-sex attracted youth in the present sample, inhibiting us from studying same- and both-sex attracted subgroups. Dichotomizing categorical identity variables is known as the lumping error (Else-Quest & Hyde, 2016) and may obstruct knowledge on these groups. Given, for instance, the different forms of stigma that bisexual people experience from both other-sex attracted and same- and both-sex attracted people (Ross et al., 2018), it could be that this would translate to differences in profiles of peer and family social support, online contacts, and preferences for online communication among same- and both-sex attracted adolescents. Third, no inferences can be made about causality because we used cross-sectional data. This is especially relevant as the present study can make no claims whether changes in peer and family social support are associated with changes in adolescents' online contact and vice versa. Fourth, the current study used a limited measure of gender/sex as it is unclear whether it assesses sex assigned at birth or gender identity (Boer et al., 2022). Measures that differentiate between these constructs and acknowledging non-binary identities are needed. Fifth, the sexual orientation of those who provided support and those with whom participants had contact online was not assessed. This is especially relevant as sexuality-specific support is often provided by same- and both-sex attracted peers (de Lange et al., 2023) Last, LPA is a data-driven method. Other research is therefore needed to substantiate the profiles found in the present study.

We primarily focused on positive attributes of online behaviors for same- and both-sex attracted adolescents. However, research has also pointed to potential negative consequences of the internet for same- and both-sex attracted youth. For instance, research described that some sexual minority-orientated spaces online might perpetuate or initiate unhealthy sexual, emotional, and bodily health issues (Hawkins & Watson, 2017). Research should, therefore, also be cognizant of these more negative influences online spaces might have on same- and both-sex attracted youth.

Conclusion

This study examined profiles of peer and family social support, online contact with close friends, friends from a larger friend group, friends met through the internet, and people other than friends, and preferences for online communication. Sexual attraction-based differences in these profiles were examined as well. Results indicated that same- and both-sex attracted adolescents were more likely to be part of more socially vulnerable profiles than their other-sex attracted peers. The findings primarily indicate that same- and both-sex attracted adolescents report average to low social support by peers and family compared with other-sex attracted adolescents and are generally similar in their frequency of online communication and their preferences for online communication. This indicates that same- and both-sex attracted adolescents continue to report lower levels of social support and at the same time seem to find community online.

Disclosure Statement

No potential conflict of interest was reported by the authors.

Funding

Baams acknowledges funding from the research program Innovational Research Incentives Scheme Veni [016.Veni.195.099], financed by the

Dutch Research Council (NWO). HBSC data collections were financially supported by the Dutch Ministry of Health.

ORCID

Wouter J. Kiekens http://orcid.org/0000-0003-3715-1323

Data Availability Statement

The data that support the findings of this study are available from Gonneke W. J. M. Stevens, upon reasonable request.

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