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Massachusetts Youth Screening Instrument for mental health needs of youths in residential welfare/justice institutions: identifying gender differences across countries and settings

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ABSTRACT

This study examines the use of the Massachusetts Youth Screening Instrument-Second Version (MAYSI-2) for mental health needs among 1643 youngsters in residential welfare/justice institutions in Europe and the USA, identifying gender differences across countries and settings. Overall, the MAYSI-2 appeared to be a reliable instrument among these youngsters, with only some scales falling (slightly) below the threshold of acceptable internal consistency. Girls (vs. boys) in Belgian/USA justice institutions and Swiss mixed welfare/justice institutions displayed higher scores for the angry-irritable, depressed-anxious, somatic complaints, suicide ideation scales. Also, detained girls from Belgium and Switzerland reported higher scores for traumatic experiences. No gender differences were revealed among adolescents in German welfare institutions. Our findings suggest that the MAYSI-2 may serve as a useful mental health screening instrument among youngsters in welfare/justice institutions and that girls in justice institutions and mixed welfare/justice institutions form a particularly vulnerable population with regard to mental health problems.

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Introduction

Prior work convincingly showed that adolescents in juvenile justice institutions have substantial mental health needs (Colins et al., 2010; Teplin, Abram, McClelland, Dulcan, & Mericle, 2002; Van Damme, Colins, & Vanderplasschen, 2014; Vermeiren, Jaspers, & Moffitt, 2006). In the late 1990s, a mental health movement emerged in the United States of America (USA) and in European juvenile justice settings that triggered increased attention to mental health needs among justice-involved youths (Grisso, 2007). The Massachusetts Youth Screening Instrument-Second Version (MAYSI-2; Grisso, Barnum, Fletcher, Cauffman, & Peuschold, 2001) was developed to enable a brief and standardized mental health screening among justice-involved boys and girls. MAYSI-2 studies in juvenile justice institutions in the USA consistently demonstrated gender differences in mental health problems (Cauffman, 2004; Cauffman, Lexcen, Goldweber, Shulman, & Grisso, 2007; Grisso et al., 2001; Vincent, Grisso, Terry, & Banks, 2008), with girls on average reporting more problems than boys except those related to substance use and trauma. Until now, all studies on gender differences in adolescent mental health problems, as measured with the MAYSI-2, have been conducted in juvenile justice institutions in the USA. Because the MAYSI-2 is increasingly implemented in European juvenile justice institutions as well as European youth welfare institutions, further research is needed to determine whether the established gender differences can be replicated across countries and across different types of settings. The present study was designed to fill this void.

The MAYSI-2 as Mental Health Screening Instrument

The MAYSI-2 aims to identify 12- to 17-year-old juvenile justice-involved adolescents who display acute mental health problems (e.g. suicide risk), are in need of direct support, or are likely to have a mental disorder and may need psychiatric evaluation (Grisso et al., 2001). This self-report questionnaire includes five scales for both boys and girls (i.e. alcohol/drug use, angry-irritable, depressed-anxious, somatic complaints, and suicide ideation), one scale with slightly different items for boys and girls (i.e. traumatic experiences), and one scale for boys only (i.e. thought disturbance). The MAYSI-2 requires no more than ten minutes to administer and, overall, has been shown to provide a reliable and valid assessment of mental health needs (Grisso et al., 2001).

The instrument has been translated in several languages and is increasingly used in various European countries (e.g. Markus, Colins, Vahl, Matser, & Vermeiren, 2009; Schmid & Bailey, 2008; for more information about the various countries and translations of the MAYSI-2, see: www.inforsana.eu). Up to now, however, the psychometric properties and clinical utility of the MAYSI-2 in European juvenile justice institutions have not been examined extensively. The

Dutch MAYSI-2 provides a reliable assessment of mental health problems among detained male adolescents, although, in line with USA findings, the internal consistency of the depressed–anxious, somatic complaints, thought disturbance, and traumatic experiences scale scores were not always acceptable (Cronbach's alpha below .70; Colins et al., 2014). The validity of the Dutch MAYSI-2 scores was demonstrated by revealing the expected relations with DSM-IV disorders and with conceptually similar scales from the youth self-report (YSR; Verhulst, Van der Ende, & Koot, 1997) and the strength and difficulties questionnaire (SDQ; van Widenfelt, Goedhart, Treffers, & Goodman, 2003) (Colins, Grisso, Mulder, & Vermeiren, 2014; Colins et al., 2014). A study among justice-involved male adolescents in the U.K. indicated that the MAYSI-2 displayed good convergent validity, but poorer discriminant validity, with conceptually similar scales from the YSR (Achenbach & Rescorla, 2001; Lennox, O'Malley, Bell, Shaw, & Dolan, 2015). Yet, the latter study presented no information regarding the internal consistency of the MAYSI-2 scores. Importantly, these European studies relied on exclusively male samples, which do not allow generalizability of the results to girls in juvenile justice institutions.

Gender differences in mental health problems across countries

Prior MAYSI-2 work in USA juvenile justice institutions indicated clear gender differences in mental health problems. Overall, detained female adolescents reported significantly higher scores for the MAYSI-2 scales anger-irritability, depressed–anxious, somatic complaints, and suicide ideation compared to males, whereas no gender differences were revealed for alcohol/drug use and traumatic experiences (Cauffman, 2004; Cauffman et al., 2007; Grisso et al., 2001). Likewise, detained girls were significantly more likely to score at or above the caution cutoff scores for the angry–irritable, depressed–anxious, somatic complaints, and suicide ideation scales compared to boys (Cauffman et al., 2007; Vincent et al., 2008).

One can expect that gender differences that were revealed in USA MAYSI-2 studies can only partially be replicated in European countries. First, European juvenile justice institutions have a different ethnic composition of adolescents compared to the USA (Colins et al., 2013) and mental health problems vary in their expression both cross-nationally and cross-ethnically (Karnik et al., 2010; Richter, Sagatun, Heyerdahl, Oppedal, & Roysamb, 2011; Veen, Stevens, Doreleijers, van der Ende, & Vollebergh, 2010; Vermeiren, Jones, Ruchkin, Deboutte, & Schwab-Stone, 2004). Different countries or ethnic groups are characterized by particular cultures of upbringing, including particular gendered socialization practices which may influence boys' and girls' identity development and related mental health problems (Berk, 2006; Ybrandt, 2008). Second, Europe and the USA differ in their organization of the juvenile justice and (mental) healthcare system (Lennox et al., 2015). Differences in the organization of these services (e.g.

availability of mental health services, capacity of juvenile justice institutions to accommodate girls) may influence approaches and decisions of the juvenile justice system, thereby shaping the particular characteristics of boys and girls who are admitted to juvenile justice institutions (Andersson, 2007; Lenssen, Doreleijers, van Dijk, & Hartman, 2000; Van Damme et al., 2014). For both reasons, different patterns of gender differences in mental health problems may appear in detained youth in the USA compared to Europe.

Gender differences in mental health problems across settings

The MAYSI-2 is also increasingly implemented in youth welfare institutions and mixed welfare and justice institutions. Unlike juvenile justice institutions, youth welfare facilities and mixed welfare and justice institutions are not necessarily closed or highly secured. They provide outpatient, day patient, and inpatient care, with the latter ranging from closed to half-open and open. In addition, placement in these facilities is not necessarily imposed by a judge, but can also be the result of the youngster's or the parents' own choice. Nevertheless, similar to adolescents in juvenile justice institutions, adolescents in youth welfare institutions and mixed welfare and justice facilities have substantial mental health needs (Dolitzsch et al., 2014; Niemann & Hassler, 2014). Therefore, implementing standardized mental screening is highly relevant in these facilities as well (Levitt, 2009). Because of the differences in reasons for placement in welfare institutions and mixed welfare and justice institutions compared to juvenile justice institutions, differences in gender-specific mental health needs can be expected as well (Cauffman et al., 2007). Girls in welfare institutions or mixed welfare and justice institutions are likely to display higher rates of internalizing problems, but lower or similar rates of externalizing problems, than their male counterparts (Dolitzsch et al., 2014; Engel, Patow, & Hassler, 2009; Guibord, Bell, Romano, & Rouillard, 2011). This contrasts evidence that girls in juvenile justice institutions have higher rates of internalizing problems, but similar or even higher rates of externalizing problems than boys (Cauffman, 2004; van der Helm, Beunk, Stams, & van der Laan, 2014; McCabe, Lansing, Garland, & Hough, 2002).

The current study

The overall aim of the current study was to examine the use of the MAYSI-2 for screening mental health needs of youngsters in residential welfare/justice institutions in Europe and the USA, identifying gender differences across countries and settings. Given its focus on gender differences, this study included the six scales that are available for both boys and girls (the thought disturbance scale, meant only for boys, was excluded). The first aim was to explore the internal consistency of the MAYSI-2 scales for boys and girls across different countries

and settings. Based on prior MAYSI-2 studies (Colins et al., 2014; Grisso et al., 2001), we hypothesized that the scale scores would be internally consistent among these youngsters, although the depressed–anxious, somatic complaints, and traumatic experiences scores were expected to be less internally consistent than the other MAYSI-2 scale scores. The second aim was to examine gender differences in MAYSI-2 scores across countries and settings. Based on prior studies in welfare institutions and mixed welfare and justice institutions (Dolitzsch et al., 2014; Engel et al., 2009; Guibord et al., 2011), we expected that girls (vs. boys) would have significantly higher depressed–anxious, somatic complaints, suicide ideation scores, but similar or lower alcohol/drug use, and angry–irritable scores. With regard to juvenile justice institutions, we expected to replicate these latter findings, with the exception that we hypothesized that girls would have similar or higher alcohol/drug use, and angry–irritable scores (Cauffman, 2004; McCabe et al., 2002; Van Damme et al., 2014). Finally, given the contextual cross-national differences in the ethnic composition of detained youth and the organization of the juvenile justice and (mental) healthcare system described earlier, we expected that gender differences may vary across countries, especially between the USA and European countries.

Method

Participants and procedures

The total sample consisted of 1643 youngsters from four countries (i.e. the USA, Belgium, Switzerland, and Germany). Cases with missing items throughout all MAYSI-2 scales or without gender information were excluded. In addition, the following cross-national sample selection criteria were set: (i) residential youth welfare/justice institutions; (ii) individual MAYSI-2 administration; and (iii) administration by means of paper-and-pencil forms (read by the youths themselves) or by computer; and (iv) an age range between 10 and 18 years at the time of MAYSI-2 administration. The upper limit on age of 18 years was selected because this represents the age of majority in all countries we studied. Only 54 youth having reached the age of 18 (i.e. being 18.00–18.98 years old) were included, for sample size considerations. For simplicity, we refer to the participants as ‘youngsters/youths/adolescents’ in general and ‘boys/girls’ in particular.

United States

The final USA sample consists of youngsters residing in both pretrial detention sites and secure corrections sites. Youths in pretrial detention centers are in custody either prior to legal disposition of their delinquency charges or while awaiting placement after adjudication of their charges. Youngsters are placed in secure corrections sites after adjudication of their charges (which can range from minor charges to serious violence, including murder).

Archival MAYSI-2 data from juvenile justice sites included in the present study represent a subsample drawn from a larger dataset reported on previously (Vincent et al., 2008). All users of the software for administering the MAYSI-2, MAYSIWARE, registered within the United States between 1999 and 2003 ($n = 451$) were invited to participate by e-mail. MAYSIWARE users were identified by their inclusion in the National MAYSIWARE Registry Database, housed at the University of Massachusetts Medical School. The users who responded affirmatively were asked to answer questions pertaining to their site demographics and to submit de-identified data. Of the 451 registered MAYSIWARE sites, being responsible for 1,020,623 adolescents, 65 sites submitted data on 70,423 adolescents (participation rate = 6.9%; see: Vincent et al., 2008). Based on the cross-national selection criteria, 66,112 cases were excluded, resulting in a final sample of 4311 adolescents. In order to create a cross-national sample with somewhat balanced sample sizes across countries, a subsample of 325 girls and 325 boys, assessed in 2002–2003, was randomly selected using SPSS. The adolescents in the final sample were between 12.02 and 17.98 years old ($M = 15.55$; $SD = 1.28$). Regarding origin (i.e. the youngsters' ethnic descent), 47.56% was white, 32.31% black, 8.60% Hispanic, 6.49% Alaska Native, .32% Asian, and 4.71% was of another origin.

Belgium

The final Belgian sample consists of youngsters residing in a juvenile justice institution. Placement in a juvenile justice institution is only possible following referral by the juvenile judge because of an offense (e.g. shoplifting, burglary) or an urgent problematic educational situation (e.g. persistent truancy, prostitution). Placement in these institutions represents the most severe measure allowable by a juvenile judge. Juvenile justice institutions can include both youngsters in pretrial and posttrial conditions.

Between 2012 and 2014, 307 adolescents from the juvenile justice institutions in Flanders, the Dutch-speaking part of Belgium, were eligible to participate as they met the following criteria: (i) being adjudicated to be placed in a juvenile justice institution for at least one month; (ii) having sufficient knowledge of Dutch; and (iii) having sufficient cognitive abilities. Of these 307 adolescents, eight adolescents could not be approached because of practical circumstances, and 30 adolescents and/or their parents refused participation, resulting in a sample of 269 adolescents (participation rate = 87.6%). Based on the cross-national selection criteria, 14 cases were excluded, resulting in a final sample of 255 adolescents. The sample consisted of 146 girls and 109 boys, aged between 13.52 and 18.17 years old ($M = 16.35$; $SD = 1.07$). Regarding ethnic descent, 62.45% was of Belgian origin, 7.51% of Moroccan origin, 2.77% Turkish, .79% Dutch, and 26.88% was of another origin.

Participants were approached and assessed following a standardized protocol. Written informed consent was provided prior to the assessment. At the moment the youngsters entered the juvenile justice institution, their parents also received a letter including information about the study and could refuse participation. Participants were assessed between three days and three weeks after the start of detention. The assessment was conducted by researchers or final-year master students of Ghent University. This study was approved by the directors of the institutions and by the Institutional Review Board of the Faculty of Psychology and Educational Sciences at Ghent University.

Switzerland

The final Swiss sample consists of youngsters residing in welfare and justice institutions. Youngsters can be placed in welfare and juvenile justice institutions based upon a criminal law measure (because of offending behavior), a civil law measure (because of an alarming educational situation), or other reasons (for example, their own or their parents' choice). Swiss welfare and juvenile justice institutions have different placement settings, including open, half-open, and closed placements.

Since 2011, the Department of Child and Adolescent Psychiatric Research of the Psychiatric University Hospitals (UPK) Basel, Switzerland, offered youth welfare and justice institutions in Switzerland the opportunity to participate in EQUALS (Ergebnisorientierte Qualitätssicherung in sozialpädagogischen Einrichtungen; in English: outcome-oriented quality management in child welfare and juvenile justice institutions). EQUALS provided a computerized tool for standardized assessment of the youngsters' personal history, the presence or absence of mental health problems, and educational needs at intake. Among other instruments, the software included the MAYSI-2. Although EQUALS aimed at supporting standardized mental health screening upon entry to welfare/justice facilities, all institutions were free to choose which youngsters to assess and which instruments to administer. Conducting self-report measures always required (i) informed consent of the youngsters (and their parents, for youngsters younger than 16 years) and (ii) sufficient cognitive abilities to answer the questions. All collaborators were trained in test interpretation by professionals of the EQUALS-Team.

Between 2011 and 2015, 1362 adolescents resided in 30 mixed youth welfare and juvenile justice institutions in the German-speaking part of Switzerland, of which 846 adolescents completed the MAYSI-2 (participation rate = 62.1%). Based on the cross-national selection criteria, 205 cases were excluded, resulting in a final sample of 641 youngsters. The sample consisted of 281 girls and 360 boys. The youngsters were between 10.12 and 18.98 years old ($M = 15.44$; $SD = 1.81$) and 79.72% was born in Switzerland (no information on youngsters' origin was available).

Germany

The final German sample consists of youngsters residing in youth welfare institutions. Youngsters are placed in youth welfare institutions based upon a civil law measure (because of problematic educational situations, such as maltreatment, parental psychopathology, prostitution, and substance abuse). German stationary youth welfare institutions provide open as well as half-open and closed placements for youngsters under their supervision.

Following the approach in Switzerland, several youth welfare institutions in Germany also applied the EQUALS-software. Between 2011 and 2015, 235 adolescents resided in seven youth welfare institutions in Baden-Württemberg, North Rhine-Westphalia and Bavaria, of which 140 adolescents completed the MAYSI-2 (participation rate = 59.6%). Based on the cross-national selection criteria, 43 cases were excluded, resulting in a final sample of 97 minors. The sample consisted of 49 girls and 48 boys, aged between 10.05 and 18.95 years ($M = 15.09$; $SD = 2.20$) and predominantly born in Germany (88.66%; no information on youngsters' origin was available).

Measure

The Massachusetts Youth Screening Instrument-Second Version (MAYSI-2; Grisso et al., 2001) was used to assess youngsters' mental health problems in the past few months. For administration in European countries, official translations of the MAYSI-2 were used, including the Dutch version in Belgium (Colins, Vahl, & Wolf, 2012; Markus et al., 2009) and the German version in Switzerland and Germany (Schmid, 2012; Schmid & Bailey, 2008) (for more information, see: www.inforsana.eu). The MAYSI-2 includes 52 yes/no items describing the presence or absence of symptoms related to mental health problems over the past few months. The 52 items are organized into scales whose scores are computed by summing item scores. As the MAYSI-2 was not developed to measure a broader construct such as psychological distress, there is no MAYSI-2 total score (Grisso & Barnum, 2006). As mentioned above, the current study included the six scales that are available for both boys and girls: alcohol/drug use, angry-irritable, depressed-anxious, somatic complaints, suicide ideation, and traumatic experiences. Except for the traumatic experiences scale, each scale has a 'caution' cutoff (identifying youths who may be in need of clinical attention) and a 'warning' cutoff (identifying scores displayed by the top 10% of youths in the original USA sample, reflecting youth who are even more in need of clinical attention) (Vincent et al., 2008). Table 1 presents the number of items, range, and cutoff scores for the MAYSI-2 scales. In the current study, we used six continuous MAYSI-2 scale scores and five dichotomous MAYSI-2 scale classifications indicating whether a youth was above or below the caution cutoff.

Table 1. Number of items, range, cutoff scores, definition, and sample item for MAYSI-2 scales.

MAYSI-2 scale	Number of items	Possible range	Caution cutoff	Warning cutoff	Definition and sample item ^a
Alcohol/drug use	8	0–8	4	7	Frequent use of alcohol or drugs; risk of substance abuse 'Have you used alcohol or drugs to make you feel better?'
Angry–irritable	9	0–9	5	8	Experiences frustration, lasting anger, and moodiness 'When you have been mad, have you stayed mad for a long time?'
Depressed–anxious	9	0–9	3	6	Experiences depressed and anxious feelings 'Have nervous or worried feelings kept you from doing things you want to do?'
Somatic complaints	6	0–6	3	6	Experiences bodily discomforts associated with distress 'Have you had bad headaches?'
Suicide ideation	5	0–5	2	3	Experiences thoughts and intentions to harm oneself 'Have you felt like hurting yourself?'
Traumatic experiences	5	0–5	–	–	Lifetime exposure to events the youth considers traumatic (separate versions for boys and girls) 'Have you ever seen someone severely injured or killed (in person, not in movies or on TV)?'

Note: MAYSI-2 = Massachusetts Youth Screening Instrument-Second Version.

^aYouth responds to the items to express feelings/behaviors 'in the past few months.'

Statistical analyses

The internal consistency of the MAYSI-2 scale scores was examined using Cronbach's alpha (α) for boys and girls from different countries and settings. By convention, an α higher than .70 is indicative of adequate internal consistency (Streiner, 2003; Tavakol & Dennick, 2011). Because α penalizes scales with few items, we also presented the mean inter-item correlation (MIC). MIC values between .15 and .50 were considered adequate (Clark & Watson, 1995). Second, gender differences were examined using independent t -tests for the six continuous MAYSI-2 scores (i.e. alcohol/drug use, angry–irritable, depressed–anxious,

Table 2. Alpha coefficients (α) and mean inter-item correlations (MIC) for MAYSI-2 scales.

	USA				Belgium				Switzerland				Germany			
	Juvenile justice institutions				Juvenile justice institutions				Mixed welfare and justice institutions				Youth welfare institutions			
	Boys ($n = 325$)		Girls ($n = 325$)		Boys ($n = 109$)		Girls ($n = 146$)		Boys ($n = 360$)		Girls ($n = 281$)		Boys ($n = 48$)		Girls ($n = 49$)	
	α	MIC	α	MIC	α	MIC	α	MIC	α	MIC	α	MIC	α	MIC	α	MIC
ADU	.83	.37	.84	.38	.85	.41	.85	.42	.87	.45	.85	.42	.90	.52	.89	.50
AI	.82	.32	.84	.37	.72	.22	.80	.31	.77	.27	.75	.25	.82	.33	.73	.23
DA	.74	.24	.74	.23	.67	.19	.77	.27	.69	.20	.68	.19	.79	.30	.75	.25
SC	.73	.31	.78	.37	.67	.25	.57	.18	.63	.24	.72	.30	.80	.40	.54	.17
SI	.82	.47	.88	.58	.83	.51	.89	.63	.85	.53	.87	.58	.80	.45	.92	.68
TE	.59	.22	.71	.33	.64	.27	.65	.27	.58	.22	.63	.25	.52	.18	.57	.20

Notes: MAYSI-2 = Massachusetts Youth Screening Instrument-Second Version; ADU = alcohol/drug use; AI = angry-irritable; DA = depressed-anxious; SC = somatic complaints; SI = suicide ideation; TE = traumatic experiences.

somatic complaint, suicide ideation, and traumatic experiences) and chi-square tests for the five dichotomous MAYSI-2 caution cutoff classifications (i.e. alcohol/drug use, angry-irritable, depressed-anxious, somatic complaints, and suicide ideation). SPSS 22.0 was used for all analyses with .05 as the standard for statistical significance. As we conducted multiple tests, the Bonferroni correction was applied, resulting in adjusted standards for statistical significance of .008 for the six independent t -tests and .01 for the five chi-square tests.

Results

Internal consistency of the MAYSI-2 scale scores

Table 2 presents α and MIC values for the MAYSI-2 scales. Regardless of gender, country, or setting, the alcohol/drug use, angry-irritable, and suicide ideation scales displayed adequate internal consistency throughout all samples. The depressed-anxious and somatic complaints scales had adequate internal consistency for, respectively, most or half of the samples. Regardless of gender, country, or setting, alpha coefficients for the traumatic experiences scale fell below .70 throughout all but one sample (i.e. the USA girls). Yet, MIC values for the latter MAYSI-2 scales were considered adequate, ranging between .15 and .50.

Gender differences in self-reported mental health problems

Table 3 shows that regardless of country or setting, no gender differences were revealed for the alcohol/drug use scale. Girls (vs. boys) reported significantly higher scores on the angry-irritable, depressed-anxious, somatic complaints, and suicide ideation scales, in both juvenile justice institutions in Belgium/USA

Table 3. Means (standard deviations) for MAYSI-2 scales by gender.

	USA				Belgium				Switzerland				Germany			
	Juvenile justice institutions		t (df)		Juvenile justice institutions		t (df)		Mixed welfare and justice institutions		t (df)		Youth welfare institutions		t (df)	
	Boys (n = 325)	Girls (n = 325)	Boys (n = 109)	Girls (n = 146)	Boys (n = 360)	Girls (n = 281)	Boys (n = 48)	Girls (n = 49)								
ADU	1.94 (2.29)	2.08 (2.36)	.73 (644)	2.41 (243)	1.61 (2.28)	1.82 (2.30)	1.19 (639)	1.58 (2.44)	1.69 (2.44)	1.19 (639)	1.82 (2.30)	1.58 (2.44)	1.69 (2.44)	1.19 (639)	1.58 (2.44)	1.69 (2.44)
AI	3.07 (2.64)	3.90 (2.87)	3.83 (644)*	4.05 (247)*	3.57 (2.59)	4.79 (2.50)	6.02 (639)*	4.06 (2.80)	3.92 (2.42)	3.57 (2.59)	4.79 (2.50)	6.02 (639)*	4.06 (2.80)	3.92 (2.42)	3.57 (2.59)	4.79 (2.50)
DA	1.96 (2.06)	2.46 (2.24)	2.97 (641)*	6.01 (237)*	1.96 (1.93)	3.60 (2.26)	9.76 (550)*	2.94 (2.56)	3.53 (2.51)	1.96 (1.93)	3.60 (2.26)	9.76 (550)*	2.94 (2.56)	3.53 (2.51)	1.96 (1.93)	3.60 (2.26)
SC	1.85 (1.77)	2.64 (2.00)	5.33 (632)*	6.69 (244)*	1.12 (1.35)	2.57 (1.87)	10.95 (492)*	1.77 (1.88)	2.37 (1.58)	1.12 (1.35)	2.57 (1.87)	10.95 (492)*	1.77 (1.88)	2.37 (1.58)	1.12 (1.35)	2.57 (1.87)
SI	.59 (1.21)	1.10 (1.67)	4.40 (592)*	7.85 (243)*	.80 (1.43)	1.88 (1.95)	7.80 (497)*	1.21 (1.60)	1.94 (2.12)	.80 (1.43)	1.88 (1.95)	7.80 (497)*	1.21 (1.60)	1.94 (2.12)	.80 (1.43)	1.88 (1.95)
TE	1.65 (1.42)	1.80 (1.59)	1.26 (636)	3.00 (248)*	1.76 (1.39)	2.16 (1.47)	3.57 (639)*	2.46 (1.38)	2.00 (1.35)	1.76 (1.39)	2.16 (1.47)	3.57 (639)*	2.46 (1.38)	2.00 (1.35)	1.76 (1.39)	2.16 (1.47)

Notes: MAYSI-2 = Massachusetts Youth Screening Instrument-Second Version; ADU = alcohol/drug use; AI = angry-irritable; DA = depressed-anxious; SC = somatic complaints; SI = suicide ideation; TE = traumatic experiences.
*p < .008.

and in welfare and justice institutions in Switzerland. Girls (vs. boys) also displayed significantly higher scores for the traumatic experiences scale, however, only in the Belgian and Swiss samples. None of the above gender differences were replicated among adolescents in youth welfare institutions in Germany.

Table 4 shows that when using dichotomous MAYSI-2 scores, similar results were obtained. In all but one sample (i.e. youth welfare institutions in Germany), girls were significantly more likely to score at or above the caution cutoff scores for internalizing scales (i.e. depressed–anxious, somatic complaints, and suicide ideation scales) as well as externalizing scales (i.e. the angry–irritable subscale).

Discussion

This study was the first to examine the use of the MAYSI-2 for screening mental health needs of youngsters in residential welfare/justice institutions in Europe and the USA, identifying gender differences across countries and settings. The study was conducted among 1643 youngsters in welfare/justice institutions located in three European countries and in the USA. Overall, the MAYSI-2 appeared to be a reliable instrument among these youngsters, with all scales having acceptable internal consistency according to alpha coefficients and/or MIC values (i.e. an index that is not affected by the number of items in a scale). Clear gender differences emerged among youngsters in Belgian/USA juvenile justice institutions and Swiss welfare and justice institutions, whereas no gender differences were revealed among adolescents in welfare institutions in Germany.

In line with prior MAYSI-2 work among detained youths in the USA (Cauffman, 2004; Cauffman et al., 2007; Grisso et al., 2001; Vincent et al., 2008), girls in Belgian/USA juvenile justice institutions displayed higher levels of internalizing symptoms (as evidenced by elevated scores on the depressed–anxious, somatic complaints, and suicide ideation scales) as well as higher levels of anger-irritability than boys. In addition, detained girls from Belgium also reported higher scores for traumatic experiences, compared to boys, in line with findings from prior studies among detained minors (Abrantes, Hoffmann, & Anton, 2005; Ford, Chapman, Pearson, Borum, & Wolpaw, 2008; McCabe et al., 2002). These gender differences may reflect (i) true differences in prevalence rates (*individual level*); (ii) differences in self-reporting (*assessment level*); or (iii) differences in referral/placement procedures (*system level*) (Cauffman, 2004; Stewart & Trupin, 2003).

Several possible explanations for the observed gender differences can be found. First, the gender paradox or relative deviance theory can help to explain gender differences in MAYSI-2 scores on the *individual level*. According to this theory, relatively fewer girls than boys display serious disruptive behavior, but among girls who do show such behavior, a more severe and co-morbid pattern of internalizing and externalizing problems tends to be observed (Loeber & Keenan, 1994; Stewart & Trupin, 2003). Second, the gender differences in the current study may be accounted for at least in part by gendered socialization

Table 4. Percentage scoring at or above MAYSI-2 scale caution cutoff scores by gender.

	USA				Belgium				Switzerland				Germany			
	Juvenile justice institutions		Juvenile justice institutions		Mixed welfare and justice institutions		Youth welfare institutions		Mixed welfare and justice institutions		Youth welfare institutions		Youth welfare institutions		Youth welfare institutions	
	Boys (n = 325)	Girls (n = 325)	χ^2 (df = 1)		Boys (n = 109)	Girls (n = 146)	χ^2 (df = 1)		Boys (n = 360)	Girls (n = 281)	χ^2 (df = 1)		Boys (n = 48)	Girls (n = 49)	χ^2 (df = 1)	
ADU	26	27	.07		32	47	4.96		20	24	.96		21	27	.44	
AI	29	44	16.27*		45	66	11.72*		35	52	17.96*		46	39	.50	
DA	34	43	5.80		38	71	26.20*		34	63	53.46*		46	63	2.97	
SC	33	51	22.76*		43	80	34.50*		14	52	106.04*		35	41	.30	
SI	16	29	16.94*		25	61	30.23*		21	45	40.05*		33	49	2.45	

Notes: MAYSI-2 = Massachusetts Youth Screening Instrument-Second Version; ADU = alcohol/drug use; AI = angry-irritable; DA = depressed-anxious; SC = somatic complaints; SI = suicide ideation; TE = traumatic experiences.

* $p < .01$.

practices and related gender-specific self-reporting tendencies (i.e. *assessment level*). For example, boys may be less inclined than girls to reveal their feelings on self-report scales (Grisso & Barnum, 2006). Third, gender-dependent filtering effects in referral/placement procedures may partly account for the present gender differences (i.e. *system level*; Cauffman et al., 2007). Police officers and judges, for instance, are less likely to make decisions resulting in the arrest and detention of girls than boys (Andersson, 2007; Lenssen et al., 2000), implying that girls being detained represent the most disturbed or antisocial group (Abram, Teplin, McClelland, & Dulcan, 2003; Vincent et al., 2008).

The above gender differences were also present among adolescents in mixed welfare and justice institutions in Switzerland: girls reported higher levels of internalizing problems (depressed–anxious, somatic complaints, and suicide ideation), anger-irritability, and traumatic experiences, compared to boys. This does not dovetail with the findings of a prior study in Swiss welfare and justice institutions, which showed that females demonstrated more internalizing (e.g. mood) disorders, whereas males demonstrated more externalizing (e.g. disruptive behavior) disorders (Dolitzsch et al., 2014). However, the latter study included 6- to 25-year-olds, whereas the youth in the present study ranged in age between 12 and 18 years. Therefore, the comparison of our study's findings with those of Dolitzsch and colleagues (2014) should be interpreted with caution. Despite potential differences between USA/Belgian justice institutions and Swiss welfare and justice institutions (e.g. regarding the level of security, the level of coercion, and reasons for placement), our findings suggest cross-national similarities in gender differences in self-reported mental health problems among youths in these facilities. Consequently, gender differences in mental health problems in the population of mixed welfare and justice institutions may be understood by extrapolating what is known about gender differences in detained minors.

The current study did not reveal any gender differences among adolescents in German welfare institutions. This finding partly contrasts with prior work among youngsters in welfare institutions, which found that girls reported higher rates of internalizing problems (e.g. depression), but similar rates of externalizing problems (e.g. substance use) (Engel et al., 2009; Guibord et al., 2011). The lack of gender differences for internalizing problems in the current German sample may be explained in multiple ways. First, we cannot exclude the possibility that the relatively small number of boys and girls in the German sample restricted the power to reveal significant gender differences. Second, gender differences for internalizing disorders may be truly absent among these minors. For example, the commonly reported higher prevalence of internalizing problems in general population girls (vs. boys; Baumeister & Harter, 2007) may not be revealed in welfare institutions given the high rates of maltreatment history and subsequent mental distress for both girls and boys observed in these settings (Guibord et al., 2011). This assumption is supported by the remarkably high level of traumatic

experiences among boys in the present German sample. However, it should be noted that boys in the German sample display high scores for almost all MAYSI-2 scales. It may be that factors related to sample selection have biased our results. For example, because institutions in Germany are free to choose which youngsters to assess, only boys who already display clear mental health problems and therefore yield concern among staff may be assessed. This may be particularly true in case of limited assessment resources. Therefore, we suggest further research to scrutinize whether the above findings can be replicated in a larger sample of adolescents in German welfare institutions.

Strengths, limitations, and future research recommendations

This study has several strengths, including the cross-national design and the use of a sample of both boys and girls from welfare and justice institutions. Nevertheless, the results should be interpreted in the context of some limitations. First, although the sample consisted of multiple countries and types of settings, youth were recruited from only one type of setting within each country. This hampered our ability to interpret and draw firm conclusions regarding cross-national and cross-institutional gender differences. Future studies are warranted to examine whether our preliminary findings can be replicated in other samples of adolescents in welfare and justice institutions across the world, and how they relate to findings among adolescents in the community (Cauffman et al., 2007). In this respect, more profound analyses on the country or state level should be conducted, for example, addressing the impact of countries' or states' cultural differences on the organization of juvenile justice and (mental) health care services, which in turn are likely to influence the prevalence of mental health problems in these settings. Second, because of the small sample sizes in some of the subgroups (e.g. German boys and girls), we did not test measurement invariance of the MAYSI-2 across these groups. Accordingly, gender differences in mean scores and percentages of adolescents at or above MAYSI-2 caution cutoffs should be interpreted with caution. Future research in a larger sample of adolescents in residential welfare/justice institutions is needed to address this issue. Third, given our focus on the role of gender in relation to self-reported mental health problems, we did not consider the influence of other potentially influential variables, such as age, origin, and variables related to administration processes. We suggest future work addresses, among other things, developmental differences in mental health problems between youngsters in early, middle, and late adolescence, ethnical differences in mental health problems, the role of length of time between detention intake and MAYSI-2 administration, and the role of the examiner (staff of facility vs. research assistant) in affecting rates and degree of self-reported mental health problems. Fourth, for administration in European countries, the official Dutch and German translations of the MAYSI-2

were used. Although translation has been done accurately, using translation back-translation procedures, it is possible that minor language differences or nuances may have influenced self-reported mental health ratings (Cauffman & MacIntosh, 2006). Finally, the current study used caution cutoffs that are based on scores from youngsters in juvenile justice institutions in the USA. Given the likelihood of cross-national differences in self-reported mental health problems (Vincent et al., 2008), future research should explore the need for developing country specific cutoff scores.

Implications for clinical practice

Our findings suggest several implications for clinical practice. First, the considerable proportion of adolescents in welfare/justice institutions scoring above MAYSI-2 scale caution cutoff scores supports the importance of using appropriate instruments and methods for detecting and responding to mental health problems. Standard mental health screening upon arrival at these facilities is recommended (Grisso, 2007; Levitt, 2009). It should aid in systematically and fairly allocating limited assessment and treatment resources (Cauffman, 2004) and can be considered a first and crucial step in the search for appropriate care/treatment for these minors. In this respect, the MAYSI-2 may serve as a useful mental health screening instrument among both youngsters in juvenile justice and welfare institutions. Second, the significantly higher levels of both internalizing and externalizing problems in girls (vs. boys) in juvenile justice institutions and mixed welfare and justice institutions support the idea that these girls form a unique, particularly vulnerable and challenging population (Cauffman et al., 2007). This indicates that gender responsive care and treatment programs are needed (Van Damme et al., 2014). Third, the high prevalence of both internalizing and externalizing mental health symptoms challenges staff of welfare/justice institutions not only to address the prominent externalizing behavior of the youngsters under their supervision, but also to address the underlying internalizing problems, which are often hidden or indistinct at first sight (Van Damme, Colins, De Maeyer, Vermeiren, & Vanderplassen, 2015).

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