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How Culture and Migration Affect Risk Assessment

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A B S T R A C T

We systematically linked cross-cultural literature to the Central Eight risk factors as an example of risk assessment procedures. We expected offenders with a migration background (MB) from Turkey or Arab countries to score higher on criminal history, criminal attitudes, antisocial companions, and education and employment problems in comparison to German offenders without an MB. In contrast, for offenders with an MB from Turkey or Arab countries, a reduced risk for unsatisfactory relationships with their parents, alcohol, and leisure-related factors was assumed. The Central Eight risk factors were applied retrospectively for male offenders serving a sentence length of more than 12 months. German offenders without an MB (n = 214) were compared to offenders with a Turkish (n = 135) or Arab (n = 112) MB concerning risk profiles and predictive validity. Risk profiles of offenders with an MB deviated (d = 0.25-0.56) from risk profiles of German offenders without an MB. For offenders without an MB criminal history, antisocial personality, criminal attitudes, antisocial companions, and alcohol/drug problems significantly predicted (AUC = .56-.73) different recidivism events. Similar results were found for offenders with a Turkish MB (AUC = .60-.70) except for antisocial companions (AUC = .50). Results for offenders with an Arab MB were inconclusive; only alcohol/drug problems consistently showed good predictive values (AUC = .66-.68). Findings demonstrate that a culture-sensitive approach in risk assessment is inevitable and recommendations for culture-sensitive research, risk assessment, and offender treatment are discussed.

Cómo influyen la cultura y la migración en la evaluación de riesgos

Palabras clave:
Los ocho factores de riesgo centrales
Validez predictiva
Origen migratorio
Países árabes
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R E S U M E N

Se ha relacionado sistemáticamente la literatura multicultural con los ocho factores centrales de riesgo, como ejemplo de procesos de evaluación de riesgo. Se esperaba que los delincuentes con origen migratorio (OM) en Turquía o en países árabes obtuviesen una puntuación más alta en historial y actitud delictivos, relaciones interpersonales antisociales y problemas de educación y empleo, en comparación con los delincuentes alemanes sin origen migratorio (OM). En contraste, se asumía que los delincuentes con origen migratorio en Turquía y países árabes tenian menor riesgo de relaciones insatisfactorias con sus padres, alcohol y factores relacionados con el ocio. Se utilizaron retrospectivamente los ocho factores centrales de riesgo con delincuentes masculinos condenados a más de 12 meses. Se compararon delincuentes alemanes sin origen migratorio (n = 214) y delincuentes con origen migratorio en Turquía (n = 135) o en países árabes (n = 112) con respecto a perfiles de riesgo y validez predictiva. Los perfiles de riesgo de los delincuentes con OM se desviaban (d = 0.25, 0.56) de los perfiles de riesgo de los alemanes sin OM. Para delincuentes sin OM de historial delictivo, personalidad antisocial, actitud delictiva, relaciones antisociales y problemas de alcoholismo y drogadicción se predijeron (AUC = .56-.73) diferentes episodios de reincidencia. Se obtuvieron resultados similares para delincuentes turcos con OM (AUC = .60-.70), excepto en relaciones antisociales (AUC = .50). Los resultados para los delincuentes árabes con OM fueron inconcluyentes; solo los problemas de alcoholismo y drogadicción mostraron invariablemente valores predictivos fidedignos (AUC = .66-.68). Los resultados demuestran que es inevitable un acercamiento sensible a la cultura en la evaluación del riesgo. Se dan recomendaciones para una investigación sensible a la cultura, la evaluación del riesgo y el tratamiento de los delincuentes.

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In the last decades, science has collected an impressive body of knowledge to reveal the structure of crime and personal characteristics of offenders. One of the main purposes of research in this field is the assessment of offenders who are under the risk of reoffending. The identification of the risk to recidivate is also essential for offender rehabilitation. According to the widely-used risk-need-responsivity (RNR) model, formulated by Andrews and Bonta (2010), treatment should be provided for offenders with a high risk of recidivism (risk principle). Furthermore, treatment is especially effective when criminogenic needs are directly addressed (need principle) in an adequate manner (responsivity principle). Within this model, the *Central Eight* risk factors provide a broad and commonly used accumulation of the most prominent predictors (risk and needs) of future delinquent behavior. The Central Eight risk factors, namely *criminal history, antisocial personality pattern, criminal attitudes, antisocial companions, education and employment problems, family and marital circumstances, alcohol and drug problems,* and *leisure* (Andrews & Bonta, 2010), are used to assess the risks and needs of an offender. These factors are the fundamental basis of risk assessment tools like the Level of Service (LS) instruments (e.g., Level of Service/Case Management Inventory [LS/CMI]; Andrews, Bonta, & Wormith, 2004), which assist in the identification of risks and offender treatment. Many meta-analyses and studies have proven the validity of LS instruments globally (e.g., Gendreau, Little, & Goggin, 1996; Olver, Stockdale, & Wormith, 2014) and also nationally among European prison samples, for example in England and Wales (Hollin & Palmer, 2006; Raynor, 2007), Spain (Hilterman, Nicholls, & van Nieuwenhuizen, 2014), and Germany (Dahle, 2006).

Reflecting an ever-growing diversity in European societies (Eurostat, 2017), the current prison population is more diverse compared to samples used in previous European studies (e.g., Dahle, 2006). Foreign prisoners, for example, comprise 30% in Germany, 31% in Spain, 40% in Belgium, and up to 73% in Switzerland (Aebi, Tiago, & Burkhardt, 2015). Thus, it is very important to ensure the validity of risk assessment for diverse subgroups individually (cf. Bonta, 2002) because a "strong predictive accuracy is a prerequisite in order for a tool to be useful for the many other applications" (Olver et al., 2014, p. 6), such as the design of treatment programs. Van der Put, Stams, Dekovic, Hoeve, and van der Laan (2013) argued that treatments among culturally diverse offenders might be less effective when the treated risk factors are not able to predict recidivism. However, exact mechanisms of how culture and migration might influence the development and maintenance of delinquent behavior have rarely been integrated in common crime theories (e.g., Andrews & Bonta, 2010). Shepherd and Lewis-Fernandez (2016) outline how a culture-insensitive approach might result in an inadequate measurement, biased decisions, and ineffective treatment due to unidentified and unaddressed specific needs. They argue that although risk factors between cultures show great similarity that does not necessarily imply that all risk factors are similarly appropriate. Because "risk item content often reflects the practices, perceptions, norms, belief systems, and behavioral expectations of Western culture" (Shepherd & Lewis-Fernandez, 2016, p. 429), the risks and needs of offenders from other cultural backgrounds might be alienated. Although the need of integrating cross-cultural aspects into risk assessment has been addressed in current literature (e.g., Jones, Masters, Griffiths, & Moulday, 2002; Shepherd, 2015; Shepherd & Lewis-Fernandez, 2016; van der Put et al., 2013), specific hypotheses have rarely been formulated and explicitly tested.

To formulate concrete hypotheses, it seems appropriate to focus on different cultural groups separately. For this purpose, culture can be defined via basic value orientations (Schwartz, 2006). Following this definition, for instance, an Arab heritage – consisting of many different countries of origin – can be subsumed because all these countries form one single cultural group when mapped according to value orientations (Ingelhart & Baker, 2000; Schwartz, 2006). Although many other aspects of culture within the region will vary, there is great similarity regarding very close social bonds, low egalitarianism, and low autonomy (e.g., Hofstede, 2001). Furthermore, Turkey and Arab countries show great similarity regarding their value orientation and both differ from Germany and other North-West European counties in all these values (Ingelhart & Baker, 2000; Schwartz, 2006). Additionally, in European prisons, offenders from Turkey and Arab countries comprise a large percentage of offenders with a migration background (MB; having at least one foreign-born parent; e.g., Bauer et al., 2011; Senatsverwaltung für Justiz und Verbraucherschutz [Berlin Senate Administration for Justice and Consumer Protection], 2015; Dahle & Schmidt, 2014; Hilterman et al., 2014; van der Put et al., 2011). Thus, addressing the risk and needs of this subgroup seems to be very important.

In the following section, we will review some aspects of migration and culture and directly link relevant studies to the Central Eight risk factors to infer hypotheses on culture-sensitive risk profiles (cf. Jones et al., 2002).

Central Eight Risk Factors

Criminal History

The best predictor for future behavior is previous behavior and the most prominent risk factor for delinquency is antisocial behavior in the past (Gendreau et al., 1996). Migrants from Turkey and Arab countries are overrepresented in German crime statistics. In Berlin, 3% of inhabitants with a German citizenship were suspected of having committed a crime in 2015, whereas 6% of inhabitants with a Turkish citizenship and 7% with a Syrian or another Arab citizenship were recorded as suspects (Polizeipräsident Berlin, 2016). Consistently, pupils with a Turkish and Arab MB show a higher rate of self-reported violence compared to Germans without an MB (Baier & Pfeiffer, 2011). Differences in crime rates might be due to demographical differences (Albrecht, 1997), on the one hand, and migration stressors, on the other hand (cf. Shepherd, 2015). Stressors such as low economic status (e.g., Algan, Dustmann, Glitz, & Manning, 2010; Kogan, 2004) and discrimination (e.g., Kaas & Manger, 2012; Klink & Wagner, 1999; Safi, 2010) are well documented for Turkish and Arab communities in Germany. Thus, offenders with a Turkish or Arab MB should also show a higher *criminal history* score than German offenders without an MB.

Antisocial Personality Pattern

In addition to past behavior, stable personality traits such as an *antisocial personality pattern* are supposed to be very good predictors of future delinquent behavior (Gendreau et al., 1996). The prevalence of antisocial personality disorders is comparable in Turkey and Euro-American countries (e.g., Evren, Kural, & Erkiran, 2006). Likewise, Neumann, Schmitt, Carter, Embley, and Hare (2012) reported similar self-reported psychopathy scores in males from the Middle East and Europe. Consequently, we suppose that the various cultural groups will not differ in their total *antisocial personality pattern* score.

Criminal Attitudes

Andrews and Bonta (2010) stressed the importance of *criminal attitudes* comprising hostility, negative attitudes towards conventions, the sentence, or supervisions. Associated psychological constructs, such as morality (e.g., Nisan, 1987), perception of justice (e.g., Brockner et al., 2001), and the affordance of shame and anger (Boiger, Güngör, Karasawa, & Mesquita, 2014) differ between cultures, which should affect the definition and construction of *criminal attitudes.* The prevalent topic in the cross-cultural literature pertains

to specific behavioral codes embraced by a culture of honor (Cohen, Nisbett, Bowdle, & Schwarz, 1996; Peristiany, 1974). Because respect is hard to achieve and preserve in honor cultures, people may engage in various behaviors in order to maintain the respect of others including severe violence (Kulwicki, 2002). In line, Uskul, Cross, Sunbay, Gercek-Swing, and Ataca (2012) reported a higher action readiness for Turkish students compared to American students within honor-related situations. Similarly, Baier, Pfeiffer, Rabold, Simonson, and Kappes (2010) found that German pupils with an MB and being Muslim demonstrate more honor-related norms of masculinity than Germans pupils without an MB. Higher honor-related norms are, in turn, associated with higher rates of violence (Baier et al., 2010).

In addition, the legal system and the approved legitimacy of authorities are highly dependent on cultural socialization (Friedman, 1990). The justice system in Islamic countries differs from Euro-American jurisdictions (Crystal, 2001). For example, compared to native Germans, Kurdish and Lebanese migrants abide more often to traditional and religious norms with a lower preference of regulation by state law concerning in-group conflicts (Bierbrauer, 1994). Referring to the concept of *criminal attitudes,* as defined by Andrews & Bonta (2010), varying attitudes towards the law can be (miss)understood as unfavorable to a sentence and institutional supervision.

Furthermore, it has been shown that people from Saudi Arabia (Maddux, Martin, Sinaceur, & Kitayama, 2011) as well as Pakistani inmates in the UK (Hudson & Bramhall, 2004) prefer external attributions of their behavior. From a Euro-American perspective, an external attribution is often connected to justification and rationalization, which is embraced by the concept of *criminal attitudes,* and therefore seen as a risk factor for recidivism (cf. Andrews et al., 2004). Taken together, we assume that offenders from Turkey or Arab countries should score higher on *criminal attitudes* compared to Germans without an MB because of cross-cultural differences that might affect the rating.

Antisocial Companions

Because delinquent attitudes are learned within groups, another main risk factor for delinquency is the association with other criminal individuals (Gendreau et al., 1996). Struggling with difficult living conditions, such as a low socioeconomic status (e.g., Lacourse et al., 2006), an unstable neighborhood (e.g., Gilman, Hill, Hawkins, Howell, & Kosterman, 2014), and the shared experience of ethnic marginalization and discrimination (Ventura Miller, Barnes, & Hartley, 2011), might facilitate delinquent peer associations. Migrants from Turkey or Arab countries are exposed to such risk factors (e.g., Brettfeld & Wetzels, 2007). Evidence also shows that the affiliation to gangs is more prevalent among migrant youth than among non-migrant youth (Decker, van Gemert, & Pyrooz, 2009). Taken together, we assume that inmates with a Turkish or Arab MB have more *criminal companions* than offenders without an MB.

Family and Marital Circumstances

The formation of attitudes takes place within the family of origin. Thus, *family and marital circumstances* is one of the moderate risk factors for delinquent behavior (Andrews & Bonta, 2010). In terms of general cultural dimensions, people from Turkey or Arab countries are less individualistic compared to Euro-Americans (e.g., Hofstede, 2001). They deeply value family integrity and harmony and prefer an interdependent self-concept (Dwairy, 2006; Kagitcibasi, 2005), which highlights the meaning of social relationships and social norms for individual experience and behavior (Markus & Kitayama, 1998). Accordingly, migrants from Turkey or Morocco have very close family ties and foster traditional family values more strongly than native Europeans (Arends-Tóth & van de Vijver, 2008). In addition, family dysfunction – as a conglomeration of many troublesome circumstances – has been reported less often for young migrants from predominantly Muslim countries compared to native inmates in Germany (Dahle & Schmidt, 2014) and Austria (Bauer et al., 2011). Therefore, offenders from these cultures should have a lower risk for unsatisfactory relationships with their parents compared to German offenders without an MB.

Despite a satisfactory relationship, Andrews and Bonta (2010) stress the importance of modelling law-conform behavior within families. Because interpersonal closeness and conformity to norms, as measured by delinquent behavior of family members, are not necessarily correlated, we will examine potential group differences for both aspects separately.

Education and Employment

Low education and unemployment are risk factors for delinquent behavior (Andrews & Bonta, 2010). In Europe, migrants from Turkey or Arab countries often have more disadvantages regarding education and employment than other migrants and natives because they normally come from less developed rural areas (Algan et al., 2010; Heath, Rothon, & Kilpi, 2008). Moreover, also the second-generation is very likely to face stereotypical expectations of teachers (e.g., Glock, & Krolak-Schwerdt, 2013; Rangvid, 2007) and discrimination on the labor market (e.g., Kaas & Manger, 2012). As this disparity should also be present in a prison population, offenders stemming from Turkey or Arab countries are assumed to score higher on the risk factor *education and employment* compared to German offenders without an MB.

Leisure

Next to a satisfying job, leisure provides opportunities to gain higher self-esteem and to get involved in prosocial activities (Andrews & Bonta, 2010). Most people in the Turkish and Arab community in Germany are Sunni Muslim and report a high religious affiliation (Brettfeld & Wetzels, 2007), which is strongly connected to everyday life. Due to Islamic values, daily life is supposed to be relatively structured for Muslims compared to non-Muslims (Yip, 2004). In connection to a less individualistic orientation (e.g., Hofstede, 2001), Muslim migrants have a highly family-oriented leisure and report a high social control of free time activities (Stodolska & Livengood, 2006). Furthermore, people stemming from predominantly Muslim countries show stronger ties to organized leisure activities, at least as a part of religious groups compared to non-Muslim Germans without an MB (Baier & Pfeiffer, 2011; Haug, Müssig, & Stichs, 2009). Accordingly, compared to German offenders without an MB, offenders with a Turkish or Arab MB are expected to have fewer problems in developing structured *leisure,* as operationalized by Andrews and Bonta (2010).

Alcohol and Drug Problems

Another moderate risk factor for delinquent behavior is alcohol and drug abuse (Andrews & Bonta, 2010). Concerning alcohol, Islamic values can be seen as a protective influence, as alcohol is prohibited in Islam (e.g., Qur'an, 5:90-91, quoted after Arberry, 1996; Ghandour, Karam, & Maalouf, 2009). The prohibition is regulated by a deep internalization and social obligation as well as a high social control in Muslim societies (Valentine, Holloway, & Jayne, 2010). Accordingly, a relatively low prevalence of alcohol misuse among first and second generation immigrants from Turkey or Morocco was reported in Europe (Brussaard, van Erp-Baart, Brants, Hulshof, & Löwik, 2001) as well as among inmates with a Pakistani MB (Hudson

& Bramhall, 2004). In contrast to alcohol, an occasionally higher acceptance of drug use in some Muslim countries (Baasher, 1981) as well as in Turkish and Arab communities in Europe (Brussaard et al., 2001; Lampert & Thamm, 2007; Svensson & Hagquist, 2010) has been revealed. Thus, we assume adult offenders from Turkey or Arab countries to have fewer *alcohol problems* compared to offenders without an MB, but we expect no difference between groups regarding *drug problems.*

In sum, different risk profiles can be expected for offenders with a Turkish or Arab MB compared to native German offenders. However, this assumption does not imply that the interconnections of the *Central Eight* risk factors is the same in every group. Following Andrews and Bontas (2010) definition and operationalization, hypotheses might contradict each other. For example, being more strongly rooted in interdependent family structures does not necessarily imply a better social integration in the host society and a complete buffer for discrimination (i.e., Cooper, Brown, Metzger, Clinton, & Guthrie, 2013). In turn, discrimination might promote delinquent peer contacts. Hence, the interaction of the *Central Eight* risk factors is supposed to be connected to their specific operationalization and their predictive validity, which may vary between groups as well.

Disparities in Predictive Validity of the Central Eight

Today, the use of structured instruments is considered essential in risk assessment. Whether the validity of risk assessment tools developed in Euro-American countries generalizes across different cultural subgroups is indecisive. A recent court case in Canada challenged this assumption by stating that well-established instruments (e.g., Psychopathy Checklist Revised [PCL-R]) have not proven to be culturally unbiased regarding Indigenous offenders in Canada, and thus must be considered unreliable predictors of recidivism (Canada v. Ewert, 2015). This challenge and its implications can easily be transferred to other jurisdictions, cultural subsamples, and assessment tools (Hart, 2016).

Likewise, evidence regarding the cross-cultural invariance of the *Central Eight* is inconclusive. A recent meta-analysis, which mainly contained studies undertaken in Canada, revealed overall weighted effect sizes between r = .33 (i.e., *antisocial personality pattern*) and r = .13 (e.g., *marital/family* circumstances) when predicting general recidivism (Olver et al., 2014). For the small number of studies that presented data of minority offenders, the predictive validity was slightly reduced for *criminal history, education/employment,* and *antisocial companions* compared to non-minorities. Furthermore, the effect sizes varied stronger among minority samples (Olver et al., 2014). Additionally, Olver and colleagues showed that the predictive validity was higher for all *Central Eight* when the study was conducted in Canada compared to those reported outside of North-America (Olver et al., 2014).

Concerning predominantly Muslim countries, to our knowledge only one study is available. Bhuttha and Wormith (2016) examined the validity of an Urdu-adaption of the LS/CMI for 506 probationers in Pakistan, who were first time nonviolent offenders – an atypical sample, as the authors admit. As a recidivism criterion they used a break of probation within 10 or 11 months, which occurred for less than 10% of the sample. Predictive values were similar to those reported in Euro-American contexts for most of the *Central Eight,* except for *criminal attitudes, leisure,* and *criminal history.*

Only a few studies have evaluated the predictive validity of the *Central Eight* for offenders stemming from predominantly Muslim countries who migrated to Euro-American countries. An Australian study, which examined the youth version of the LS/CMI for different cultural subgroups, reported a lack of predictive power (Area under the Curve Indices [AUC] between .57 and .61) for culturally and linguistically diverse offenders (n = 48), stemming, inter alia, from Sudan or Lebanon. In contrast, moderate predictive values (AUC = .71-.79) were found for the English-speaking offenders (n = 85; Shepherd, Singh, & Fullam, 2015).

In Germany, Dahle and Schmidt (2014) examined the predictive validity of the predecessor of the widely-used LS/CMI (Level of Service Inventory–Revised [LSI-R]; Andrews & Bonta, 1995) for young inmates, all incarcerated for at least two years for a severe violent offence. They compared German offenders without an MB (n = 114) with offenders stemming from predominantly Muslim countries (n = 85). The groups did not differ with respect to different recidivism events during a follow-up period of five years. Besides, offenders with an MB had a lower score for *alcohol problems* (η = .44) as well as a lower total LSI-R score (η = .17) in comparison to native German offenders. In contrast, the offenders with an MB were rated on *criminal attitudes* higher than native Germans (η = .17). In sum, for Muslim offenders with an MB, neither the total score nor a single scale of the LSI-R showed a significant correlation with any of the recidivism criteria (AUC = .46-.54). In contrast, good predictive values for German offenders without an MB were found (AUC = .67-.74). Additional investigations regarding the predictive validity of the LSI-R for offenders with an MB revealed no effect of age or generation.

Taken together, evidence on the predictive validity of the *Central Eight* for ethnic minorities or culturally diverse (sub)samples is ambiguous. While some authors propose the cross-cultural transferability (Bhutta & Wormith, 2016; Olver et al., 2014; Takahashi, Mori, & Kroner, 2013; Zhang, & Liu, 2015), in some studies trends of reduced predictive power have been reported (Gutierrez, Wilson, Rugge, & Bonta, 2013; Onifade, Davidson, & Campbell, 2009; Singh, Grann, Fazel, 2011; Wilson & Gutierrez, 2014; Wormith, Hogg, & Guzzo, 2015) and yet in others a total lack of predictive validity was found (e.g., Dahle & Schmidt, 2014; Schlager & Simourd, 2007; Shepherd, et al., 2015). Furthermore, offenders with an MB from Turkey or Arab countries have rarely been studied, although they comprise a large percentage of European prison populations. Consequently, the predictive validity of the *Central Eight* for offenders with a Turkish or Arab background remains uncertain.

Purpose of the Current Study

The aim of this study was to examine the influence of culture and migration on risk assessment. It is one of a few attempts to systematically combine cross-cultural knowledge and risk assessment procedures. Furthermore, this study is one of the first studies to investigate the predictive validity of widely-used risk factors for diverse subgroups of a European prison sample. As outlined above, we assumed that offenders with a Turkish or Arab MB will have an increased score on *criminal history, criminal attitudes, antisocial companions,* and *education and employment* problems compared to German offenders without an MB. In contrast, a reduced risk for unsatisfactory relationships with their parents, *alcohol,* and *leisure*-related factors was assumed. We expected no difference between the groups concerning the prevalence of an *antisocial personality pattern.*

However, differences in the manifestation of the *Central Eight* does not have to be related to potential differences in the predictive validity of these risk factors. Regarding the predictive validity of the *Central Eight,* present evidence is ambiguous and there are only a few studies that focused on offenders with a Turkish or Arab MB living in Euro-American countries. To reveal correlations of these risk factors to future offending, we exploratively tested the differential predictive validity of the *Central Eight*, which were retrospectively applied via the LS/CMI (Andrews et al., 2004).

Table 1. Demographic Characteristics of Subsamples

	German without MB (n = 214)	Turkish MB (n = 135)	Arab MB (n = 112)
Age***	M = 36.6 (SD = 10.6)	M = 32.6 (SD = 7.2)	M = 30.4 (SD = 7.2)
Sentence length (months)	M = 48.3 (SD = 21.9)	M = 51.4 (SD = 20.4)	M = 52.9 (SD = 25.1)
Offence type			
(non-sexual) violence	30.8%	35.6%	25.9%
sexual***	21.5%	5.9%	8.9%
property **	29.0%	21.5%	14.3%
drug***	12.1%	28.9%	45.5%
other	6.1%	8.1%	5.4%
German citizenship	-	12.6%	15.2%
Sufficient German language proficiency	-	88.1%	81.3%
Born abroad***	-	64.0%	90.2%
Age at arrival (1st generation)**	-	M = 13.4 (SD = 9.5)	M = 17.3 (SD = 7.6)

Note. M = mean; SD = standard deviation; property offence = theft, fraud, receiving and disposing of stolen goods, or burglary.
Difference between groups: $^{*}p \leq .05$, $^{**}p \leq .01$, $^{***}p \leq .001$.

Method

Sample

The sample was gathered in a prison in Berlin holding male adults. All participants took part in a basic diagnostic examination at the beginning of their imprisonment between January and December 2005. Following a consecutive sampling procedure, participants were included if the sentence length allowed a followed-up period of at least three years and if personal documents of the offender were available. Aiming for sufficient sample sizes for all subgroups, documents of offenders with an MB were reviewed between January 2006 and November 2007. Because the examination procedure was comparable between 2005 and 2007, no systematic error regarding the quality of assessment within this time frame was expected. The total sample size was N = 740, while 28.9% (n = 214) of the sample had no MB. An MB was operationalized via a non-German citizenship, a birthplace abroad, or an obvious indication in the documents (i.e., parents having a non-German citizenship). Twenty-six percent (n = 135) of the sample had a Turkish MB, 21.3% (n = 112) had an Arab MB (70.1% Lebanon, 5.4% areas of Palestinian Authority control, 4.5% Syria, 4.5 % Morocco, 4.5% Algeria, 4.5% Tunisia, 6.5% other). The remaining participants were excluded from the present study because they comprised various other nationalities and cultural contexts, yet only small sample sizes each. Most of the offenders with a Turkish MB and over 80% of offenders with an Arab MB were born outside of Germany, and can thus be considered first-generation migrants. First-generation migrants from Turkey had a lower age at arrival than Arab migrants, $t(162) = 2.81$, $p \leq .006$, $d = 0.46$. However, German language proficiency was considered as sufficient in most of the cases (see Table 1).

Age ranged from 19 to 70, while offenders with an MB were younger than offenders without an MB, $F(2, 286.93) = 18.96$, $p \leq .001$, $d = 0.58$, $1\text{-}\beta = .97$. The sentence length ranged from 14 to 145 months and was similar across groups, $F(2, 460) = 1.80$, $p > .05$, $d = .18$, $1\text{-}\beta = .37$. However, groups differed regarding their type of offence (see Table 1, significant differences marked with asterisk).

Measure

To examine the *Central Eight* risk factors, we used the Risks/Needs section of the LS/CMI, which is one of the most widely used risk assessment tools in North-America and other parts of the world (Andrews et al., 2011). The LS/CMI is a standardized measure and consists of a total of 43 items, which are pooled together in eight different subscales representing the *Central Eight* risk factors (Andrews et al., 2004). The first four factors – *criminal history, antisocial personality pattern, criminal attitudes,* and *antisocial companions* – are the most important ones and named the *big four* (Andrews & Bonta, 2010). Except for *leisure,* every risk factor was measured continuously as a simple summation of various dichotomous items comprising the respective LS/CMI scale (see Andrews et al., 2004).

The *criminal history* scale (eight items) assesses the frequency, diversity, and onset of antisocial behavior. An *antisocial personality pattern* (four items) subsumes personality characteristics in terms of psychopathy as well as behavioral patterns that are associated with an antisocial behavior. The *criminal attitudes* scale (four items) is composed of supportive attitudes toward crime, attitudes towards conventions as an alternative lifestyle, attitudes regarding the appropriateness of the sentence, and compliance concerning supervision and treatment. *Antisocial companions* (four items) point to acquaintances and friends with criminal activity. The *family and marital circumstances* scale (four items) subsumes positive social support as well as a criminal history of a family member or spouse. *Education and employment* is composed of eight items, wherein past and current employment, involvement and commitment at work, and low formal education are measured. We excluded one item of the original nine-item *education and employment* scale, because detailed information of school suspension was missing in our data. Furthermore, we had to reduce the two-item *leisure* scale to one item ("could make better use of time") because in most of the cases, whether the participant joined a club or not was not assessed. Finally, *alcohol and drug problems* are assessed together in an eight-item scale.

According to the original manual, internal consistencies range between $\alpha = .42$ (e.g., *antisocial personality pattern*) and $\alpha = .80$ (e.g., *criminal history*; Andrews et al., 2004). Since no German manual of the LS/CMI is currently available, we decided to use the German version of the preceding instrument, the LSI-R (Dahle, Hawardt, & Schneider-Njepel, 2012), to code all items except the *antisocial personality pattern* scale. This seemed justified because most of the items of the LSI/CMI are similar to the LSI-R (Andrews et al., 2004).

Data and Procedure

Data for the present study was derived from a detailed documentation of the basic examination at the beginning of the prison sentence. According to the German penal law, an extensive investigation of a prisoner's personality is required to reveal the causes of his offence. The results of this procedure assist decisions regarding the risk to recidivate, the security level, and necessary interventions. At the time of the data collection, in Berlin, every convicted offender with a sentence length of more than 12 months had to undergo this procedure. It encompasses a detailed analysis of personal files as well as personal interviews. The procedure was

carried out by trained prison staff (social workers or psychologists) and the information was subsumed in a detailed report containing biography, offence, social relationships, and employment. These reports were used in the present study.

The gathered data was coded in accordance with the manual of the Risks/Needs section of the LS/CMI and the German LSI-R manual, respectively. The rater was a psychologist experienced in the examination of prisoners and application of risk measures. Thereafter, data regarding the criminal history was completed using the official criminal records taken from the National Conviction Registry (NCR) of Germany. The reliability of the coding procedure for the *Central Eight* was examined through an inter-rater agreement between two independent raters with similar education, experience, and training for 30 randomly chosen cases. The single measure of the intra-class-correlation (ICC) was used to analyze the absolute agreement. The agreement ranged from ICC = .95 ($CI_{95\%}$ = .90-.98) for *criminal history* to ICC = .76 ($CI_{95\%}$ = .55-.88) for *antisocial personality pattern* (M_{ICC} = .83, *SD* = .06).

Following German recidivism statistics, most re-offences can be expected within the first three years after release from prison (Jehle, Albrecht, Hohmann-Fricke, & Tetal, 2013). Thus, we decided to use a consistent three-year follow-up period to ensure comparable conditions for all participants. Two dichotomous recidivism events that differed in severity were chosen as criteria: (a) general recidivism (all convictions) and (b) reconviction for another prison sentence. A trained research assistant collected the information about potential recidivism using the NCR records after the coding of *Central Eight.*

Statistical Analysis

Missing data ranged from 0% for *criminal history* to 20% for *antisocial companions.* The pattern of missing data was arbitrary. The only difference between groups was found for *education/employment* since offenders with an Arab MB had more missing values on this scale compared to offenders with a Turkish MB or without an MB. Following Wadsworth and Roberts (2008) – who tested imputation methods for crime data – we imputed missing data to avoid potential bias. We used multiple imputation as it is the most reliable method for data imputation (Riedel & Regoeczi, 2004). Thus, missing data were imputed through a fully conditional specification (via a Markov chain Monte Carlo algorithm using logistic regression) over ten imputations (cf. van Buuren, 2007) for every risk factor and cultural group individually. The results of all analyses were pooled over all ten imputed data sets. We only excluded participants with no valid variable on the respective scale.

While conducting multiple significance tests, we considered the false discovery rate (FDR; Benjamini and Hochburg, 1995). We used this method because it shows substantially more statistical power than adjustments via the family-wise error rate (Benjamini & Hochburg, 1995). The FDR is the expected proportion of falsely rejected hypotheses among all rejections according to a defined threshold. For this purpose, *p*-values were arranged in a descending order and compared to the reference value (position-number*.05/ amount of hypotheses) stopping at the first occasion where the *p*-value is smaller than the reference value and rejecting all following hypotheses (Benjamini & Yekutieli, 2001, p. 1170). When testing predictive validity, we spared to control the error rate beforehand, as this part of our study followed an exploratory approach (cf. Goeman & Solari, 2011).

Risk profiles. To examine the theoretically different risk factors distinctively, we analyzed every scale of the LS/CMI separately by running one-way ANOVAs. In the case of directional hypotheses (i.e., criminal history, antisocial attitudes, antisocial companions, education and employment, family and marital circumstances, alcohol and drug problems, and leisure), we conducted one-tailed tests of the differences of means. When no differences were expected (antisocial personality pattern), two-tailed tests were conducted. If the assumption of homogeneity of variance for running an ANOVA was not met, we used the Welch-Test (cf. Field, 2005). For additional analyses on the item-level, chi-square tests were conducted. To report in a consistent manner, effect sizes were converted to Cohen's *d* via a formula suggested by Rosenthal (1994).

Predictive validity. To examine the predictive validity, different indicators were used. First, we conducted point-biserial correlations, while separate one-tailed significance tests were used for every group. According to Rice and Harris (2005), correlation coefficients of .10, .24, .37 are considered small, medium, and large, respectively. Because correlation coefficients depend on base rates (Babchishin & Helmus, 2016), we also examined receiver-operating characteristic (ROC) curves to present area-under-the-curve (AUC) values. AUC-values of .56, .64, and.71 are considered small, medium, and large effects, respectively (Rice & Harris, 2005). To compare predictive validity values across groups, we used an algorithm of homogeneity for stratified samples (McClish, 1992) and tested the apparently most-outlying value against the aggregated mean effect size.

Results

Descriptive Results and Risk Profiles

The results concerning differences in risk profiles are summarized in Figure 1. As every LS/CMI scale comprised a different number of items, we present *z*-standardized values. German offenders without an MB served as the reference group. Figure 1 illustrates that the risk profiles of offenders with an MB differed in both directions from the risk profile of Germans without an MB. Furthermore, the direction of the deviation was similar for offenders with a Turkish MB and offenders with an Arab MB. Complete psychometric information of the unstandardized variables that were used for all the following more detailed analyses can be found in Table 2.

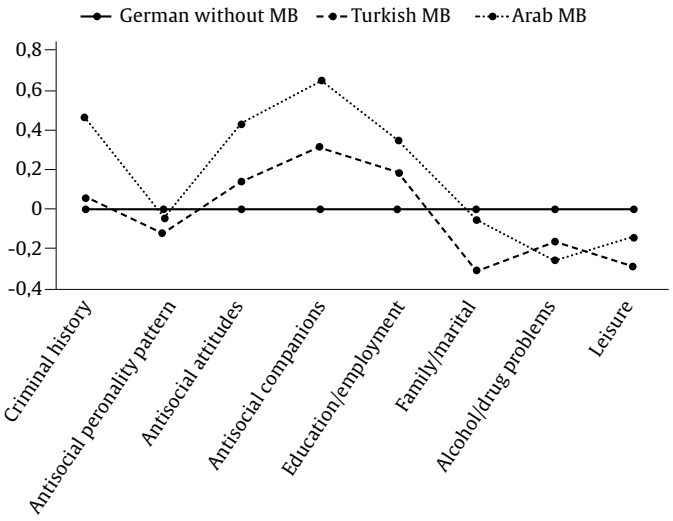

Figure 1. Risk Profiles of Offenders Having a Migration Background (MB) Compared to Germans without a MB.
Note. Standardized means of the Central Eight (LS/CMI scales). German offenders without MB served as the reference group. MB = migration background. Regarding the criminal history scale, the time of arrival in Germany was accounted for to achieve a reliable assessment.

Criminal history. Without accounting for the time of arrival in Germany, offenders stemming from Turkey or Arab countries had a slightly lower score (see Table 2) compared to Germans without an

Table 2. Psychometric Properties of the Central Eight Risk Factors for Offenders with a Migration Background (MB) Compared to Germans without an MB

					95% CI			
Central Eight	Subsample	*n*	*M*	*SD*	LL	UL	Range	α
Criminal History[1]	German without MB	214	5.22	1.61	5.00	5.44	1-8	.65
	Turkish MB	135	4.71	2.03	4.37	5.06	1-8	.75
	Arab MB	112	5.00	1.65	4.69	5.31	1-7	.60
Antisocial Pattern	German without MB	214	1.08	0.97	0.95	1.21	0-4	.30
	Turkish MB	135	0.97	0.99	0.80	1.13	0-4	.39
	Arab MB	112	1.04	0.89	0.88	1.21	0-4	.13
Antisocial Attitudes***	German without MB	214	0.75	1.00	0.61	0.88	0-4	.56
	Turkish MB	135	0.89	1.00	0.72	1.06	0-4	.46
	Arab MB	112	1.18	0.96	0.99	1.36	0-3	.32
Antisocial Companions***	German without MB	208	1.50	1.41	1.31	1.69	0-4	.80
	Turkish MB	133	1.94	1.24	1.73	2.15	0-4	.73
	Arab MB	107	2.42	1.36	2.16	2.68	0-4	.78
Education/Employment[2]*	German without MB	214	4.10	2.60	3.75	4.45	0-8	.85
	Turkish MB	135	4.59	2.51	4.17	5.02	0-8	.84
	Arab MB	111	4.99	2.28	4.57	5.43	0-8	.80
Family/Marital***	German without MB	214	1.16	1.11	1.00	1.30	0-4	.50
	Turkish MB	134	0.82	0.84	0.67	0.97	0-4	.25
	Arab MB	112	1.07	0.96	1.03	1.39	0-4	.20
Alcohol/Drug*	German without MB	214	2.17	2.64	1.82	2.53	0-8	.88
	Turkish MB	135	1.75	2.56	1.31	2.18	0-8	.91
	Arab MB	112	1.50	2.28	1.07	1.93	0-8	.88
Leisure[2]*	German without MB	176	0.39	0.49	.31	.46	0-1	
	Turkish MB	124	0.25	0.44	.17	.33	0-1	
	Arab MB	96	0.32	0.47	.23	.42	0-1	

Note. The variation in *sample size* is due to the exclusion of cases with no valid variables. CI = confidence interval; LL = lower limit; UL = upper limit; α = internal consistency. Higher scores indicate a higher risk.
[1]The time of arrival in Germany was not accounted for. Thus, a reliable assessment of criminal history is unlikely.
[2]One item of the original LS/CMI scale (Andrews et al., 2004) was excluded due to lack of information.
Difference between groups: $^{*}p \leq .05$, $^{**}p \leq 05$, $^{***}p \leq .001$.

MB, $F(2, 252.04) = 3.04$, $p \leq .049$, $d = 0.24$, 1-β = .64. However, when controlling for FDR, this difference cannot be considered significant. Not determining when an offender entered Germany makes a reliable assessment unlikely (cf. Suhling & Schott, 2001). When accounting for the time of arrival in Germany, offenders with a Turkish MB ($n = 92$) had a similar score ($M = 5.24$, $SD = 1.82$) as offenders without an MB ($n = 214$, $M = 5.23$, $SD = 1.61$). In contrast, offenders with an Arab MB ($n = 38$) had the highest score ($M = 5.97$, $SD = 1.22$) and differed significantly from the other two groups, $F(2, 104.89) = 5.84$, $p \leq .002$, $d = 0.29$, 1-β = .63. Since only migrants can violate the residence law, the number of previous offences might be biased. However, the inspection of the *three or more prior convictions* item – a potential indicator of such bias – did not show any difference between groups, $\chi^2(2) = 3.43$, $p > .05$, $d = 0.22$, 1-β = .38. Finally, it must be noted that after accounting for the time of arrival, the sample with an MB was markedly reduced to 53%.

Antisocial personality pattern. No differences were found between groups regarding the mean score of the scale, $F(2, 460) = 0.63$, $p > .05$, $d = 0.10$, 1-β = .15, (see Table 2).

Antisocial attitudes. Offenders stemming from Turkey and Arab countries scored higher on this scale (see Table 2) compared to German offenders without an MB, $F(2, 460) = 7.39$, $p \leq .0005$, $d = 0.35$, 1-β = .93.

Antisocial companions. For the total scale sum (see Table 2), a moderate effect was found for the difference between groups, which was statistically significant, $F(2, 255.66) = 16.65$, $p \leq .0001$, $d = 0.55$, 1-β = .99. Offenders with an Arab MB had the highest score, indicating a high involvement with delinquent companions.

Education and employment. Similarly, offenders with an Arab MB had the highest score on this scale (see Table 2) and differed significantly from the other groups, $F(2, 267.8) = 5.72$, $p \leq .0165$, $d = 0.31$, 1-β = .84. However, it should be noted that 38.4% ($n = 43$) of offenders with an Arab heritage and 4.4% ($n = 6$) from Turkey were not allowed to work due to their legal status in Germany. When those participants were excluded, the difference in the mean score was not significant anymore, $F(2, 409) = 2.79$, $p > .05$, $d = 0.24$, 1-β = .59.

Family and marital circumstances. On the scale-level (see Table 1), a slightly reduced risk for offenders from Turkey was found compared to offenders without an MB, $F(2, 273.12) = 0.48$, $p \leq .0005$, $d = 0.33$, 1-β = .89. However, additional item-level analyses revealed that there were substantial differences pointing in different directions. On the one hand, offenders from Turkey and Arab countries had fewer personal problems with their parents, $\chi^2(2) = 17.99$, $p \leq .0001$, $d = 0.41$, 1-β = .97. On the other hand, 48.2% of offenders with an Arab MB and 29.1% with a Turkish MB had a family member with a criminal record, while only 18.3% of offenders without an MB had a criminal family member, $\chi^2(2) = 34.08$, $p \leq .0001$, $d = 0.56$, 1-β = .99.

Alcohol and drug problems. On the scale-level, after controlling for FDR, the difference regarding substance misuse cannot be considered significant, $F(2, 269.72) = 3.04$, $p \leq .025$, $d = 0.22$, 1-β = .57 (see Table 1). Item-level analyses revealed that offenders with a Turkish or Arab MB had fewer *current alcohol problems* compared to offenders without an MB, $\chi^2(2) = 33.55$, $p \leq .0001$, $d = 0.56$, 1-β = .99. In contrast, no difference was found for *current drug problems,* $\chi^2(2) = 1.86$, $p > .05$, $d = 0.12$, 1-β = .19.

Leisure. Only 25% of the offenders with a Turkish MB had difficulties in structuring their free time, compared to 32.3% of offenders with an Arab MB and 38.6% of offenders without an MB, $\chi^2(2) = 6.15$, $p \leq .023$, $d = 0.25$, 1-β = .68.

In addition, analyses of covariance (ANCOVA) were run for each risk factor considering age as potential confounding influence. The pattern of results was similar to the reported ANOVA results. As an exception, no difference was found between the groups for *education and employment* when age was considered.

Recidivism

We ensured a reliable assessment of recidivism by excluding all participants from predictive validity analyses that could not be traced either via the NCR or their actual residence. Therefore, the actual residence of every participant was verified via the database of the State Office for Residents and Regulatory Affairs in Berlin. In sum, 115 participants (25%) had to be excluded. Eighty-eight percent of the excluded participants did not have a German citizenship. Among each group (without an MB, Turkish MB, and Arab MB) excluded and non-excluded participants were compared regarding the manifestation of the *Central Eight* risk factors. The only significant difference was found for non-excluded offenders with a Turkish MB having a lower score on *criminal attitudes* compared to excluded offenders with a Turkish MB (d = 0.60).

Offenders with an Arab MB had the highest rate of general recidivism (66.7%) compared to offenders with a Turkish MB (45.7%) and offenders without an MB (51.7%). This small effect was significant, $\chi^2(2) = 8.15$, $p \leq .05$, $d = 0.30$, 1-β = .71. One third of the sample was reconvicted for another prison sentence. However, here no difference was found between groups, $\chi^2(2) = 2.3$, $p > .05$, $d = 0.16$, 1-β = .25.

Predictive Validity

The results of the analyses on predictive validity are summarized in Table 3. For German offenders without an MB moderate predictive values were found for the Big Four of the *Central Eight* and *alcohol and drug problems*. Comparable results be reported for offenders having a Turkish MB, except for a lack of predictive power for the *antisocial companion* scale. Results for offenders with an Arab MB were inconclusive; only *alcohol and drug problems* consistently showed good predictive values for both recidivism events. In the following section, for every risk factor results are presented separately.

Criminal history[1] could predict another prison sentence independently of the cultural context (see Table 3) and there was no difference between the validity values of the different subgroups, $\chi^2(1) = 1.84$, $p > .05$, $d = 0.15$, 1-β = .37. However, criminal history did not correlate with general recidivism for Arab offenders, leading to a significant disparity concerning this recidivism event, $\chi^2(1) = 6.91$, $p \leq .01$, $d = 0.33$, 1-β = .73.

The *antisocial personality pattern* did not show any significant relationship to recidivism among offenders from Arab countries, while good predictive values were found for offenders with a Turkish MB and offenders without an MB. This was reflected by a small effect of disparity for general recidivism, $\chi^2(1) = 5.11$, $p \leq .05$, $d = 0.28$, 1-β = .75, as well as for another prison sentence, $\chi^2(1) = 6.37$, $p \leq .025$, $d = 0.27$, 1-β = .72 (see Table 3).

Similarly, the *criminal attitudes* scale did not correlate with recidivism for offenders with an Arab MB, but significant correlations were found for offenders with a Turkish MB and Germans without an MB (see Table 3). However, this disparity was not significant, neither for general recidivism, $\chi^2(1) = 1.92$, $p > .05$, $d = 0.16$, 1-β = .32, nor for another prison sentence, $\chi^2(1) = 2.36$, $p > .05$, $d = 0.16$, 1-β = .32.

Only for German offenders without an MB, the *antisocial companions* scale showed a significant correlation with both recidivism events (see Table 3). For another prison sentence, a significant disparity between the predictive values was found, $\chi^2(1) = 6.65$, $p \leq .01$, $d = 0.28$, 1-β = .75, but not for general recidivism, $\chi^2(1) = 2.77$, $p > .05$, $d = 0.21$, 1-β = .47.

Furthermore, for none of the groups, significant predictive validity was found for *family and marital circumstances* and the *education and employment* scale (see Table 3). In contrast, *alcohol and drug problems* correlated significantly with recidivism for all groups and the predictive values did not differ significantly, neither for general recidivism, $\chi^2(1) = 0.6$, $p > .05$, $d = 0.10$, 1-β = .15, nor for another prison sentence, $\chi^2(1) = 0.94$, $p > .05$, $d = 0.10$, 1-β = .15 (see Table 3).

The single item *leisure* showed no significant correlation with recidivism among offenders with a Turkish MB as well as among offenders without an MB. For offenders with an Arab MB, a significant effect for general recidivism was found but not for reconviction. However, the small difference of effect sizes between groups concerning the prediction of general recidivism (Cohen's q = .18) was not significant, $z = 1.18$, $p > .05$.

Discussion

As one of the first, this study systematically combined cross-cultural literature and risk assessment measures. Our aim was to investigate influences of culture and migration on the manifestation and predictive validity of the *Central Eight* risk factors among a

Table 3. Predictive Validity of the Central Eight Risk Factors for Offenders with a Migration Background (MB) Compared to Germans without an MB

Central Eight	Recidivism criteria	German without MB			Turkish MB			Arab MB		
		n	r_{pb}	AUC [95% CI]	n	r_{pb}	AUC [95% CI]	n	r_{pb}	AUC [95% CI]
Criminal History	General	176	.39***	.73 [.65-.80]	94	.38***	.70 [.60-.81]	81	.13	.54 [.40-.68]
	Prison Sentence	176	.25***	.65 [.57-74]	94	.37***	.71 [.60-.81]	81	.23*	.62 [.49-.74]
Antisocial Pattern	General	176	.30***	.66 [.58-.74]	94	.24*	.62 [.50-.73]	81	-.01	.49 [.37-.63]
	Prison Sentence	176	.22**	.62 [.53-.72]	94	.26**	.62 [.50-.75]	81	-.04	.49 [.36-.62]
Antisocial Attitudes	General	176	.17*	.59 [.51-.67]	94	.18*	.60 [.48-.71]	81	.02	.51 [.37-.65]
	Prison Sentence	176	.13*	.56 [.47-.66]	94	.20*	.61 [.49-.74]	81	-.01	.49 [.36-.62]
Antisocial Companions	General	171	.18*	.60 [.51-.68]	93	.02	.50 [.38-.63]	77	-.11	.50 [.36-.64]
	Prison Sentence	171	.19**	.61 [.51-.70]	93	-.05	.47 [.34-.60]	77	-.14	.42 [.29-.55]
Education/ Employment[1]	General	176	.10	.56 [.47-.64]	94	.15	.59 [.47-.71]	80	.10	.56 [.43-.69]
	Prison Sentence	176	.10	.56 [.47-.65]	94	.03	.52 [.40-.65]	80	.14	.59 [.46-.72]
Family/Marital	General	176	-.01	.48 [.39-.56]	93	.07	.53 [.42-.65]	81	-.01	.49 [.36-.63]
	Prison Sentence	176	-.03	.47 [.38-.56]	93	.05	.52 [.39-.65]	81	.13	.57 [.44-.69]
Alcohol/Drug	General	176	.21**	.63 [.55-.71]	93	.30**	.67 [.55-.78]	81	.29**	.68 [.57-.80]
	Prison Sentence	176	.18*	.61 [.52-.70]	93	.18*	.62 [.49-.74]	81	.31**	.66 [.54-.79]
Leisure[a]	General	143	.10		86	.18		69	.27*	
	Prison Sentence	143	.08		86	.02		69	.14	

Note. The variation in *sample size* is due to the exclusion of cases with no valid variables. r_{pb} = point-biserial correlation; AUC = area-under-the-curve; CI = confidence interval.
[1]One item of the original LS/CMI scale (Andrews et al., 2004) was excluded due to a lack of information.
Predictive validity: $^{*}p \leq .05$, $^{**}p \leq .01$, $^{***}p \leq .001$.

diverse European prison sample. We used data from the examination at the beginning of imprisonment retrospectively to apply the scales of the LS/CMI *as* a standardized measure of the *Central Eight.*

We compared German offenders without an MB (n = 214) and offenders stemming from Turkey (n = 135) or an Arab country of origin (n = 112) via a within-sample approach, which yielded the following main results. First, in accordance with our hypotheses derived from cross-cultural literature, offenders from Turkey or Arab countries differed from German offenders without an MB regarding their risk factors. Offenders from Turkey or Arab countries had increased scores on *criminal history, criminal attitudes, antisocial companions,* and *education and employment* problems. In contrast, for offenders from Turkey and Arab countries, a reduced risk of *family and marital* relationships, *alcohol,* and *leisure*-related factors was found. Thus, the profiles, on the one hand, suggest that offenders with a Turkish or Arab MB have more risks compared to Germans without an MB and more protective factors, on the other hand. Second, *criminal history, antisocial personality, criminal attitudes, antisocial companions,* and *alcohol/drug problems* showed good predictive power (AUC = .56-.73) for different recidivism events within a three-year follow-up for offenders without MB. The results further support evidence of predictive validity of LS instruments for Euro-American offenders (e.g., Dahle 2005; Hilterman et al., 2014; Olver et al., 2014). Comparable results were found for offenders with a Turkish MB (AUC = .60-.70), with the exception of *antisocial companions* (AUC = .50). Results for Turkish offenders contradict findings of Dahle and Schmidt (2014) who reported a total lack of predictive power of the *Central Eight* for Muslim offenders, of whom 50% had a Turkish MB. Results for offenders with an Arab MB were inconclusive, which corresponds to findings of similar studies (Dahle & Schmidt, 2014; Shepherd et al., 2015). Only *alcohol and drug problems* consistently showed good predictive values for offenders with an Arab MB (AUC = .66-.68). For every risk factor, findings will be discussed separately and recommendations for a culture-sensitive approach to research and risk assessment will be provided.

Criminal History

Offenders with an Arab MB had a higher *criminal history* score than Germans without an MB, supporting our hypothesis. This finding is in line with an overrepresentation of Turkish and Arab migrants in crime statistics (Polizeipräsident Berlin, 2016; Shepherd, 2015). As outlined in the introduction, possible explanations for these differences are manifold and diverse (e.g., Albrecht, 1997; Algan et al., 2010; Kaas & Manger, 2012; Kogan, 2004; Safi, 2010).

Criminal history correlated with different recidivism criteria for German offenders without an MB and offenders with a Turkish MB, which is in agreement with meta-analytic findings (Gendreau et al., 1996; Olver et al., 2014). For offenders with an Arab MB, the results were inconclusive, as criminal history was correlated to a more severe recidivism outcome but not to general recidivism even when controlling for the time of arrival. Thus, using criminal history as a risk factor for offenders from Arab countries warrants caution. The high percentage of exclusions (47%), when controlling for a reliable measurement, further illustrates the difficulties to assess the criminal history for recently immigrated offenders, regardless of their cultural background.

Antisocial Personality Pattern

In line with our hypothesis, no difference between groups concerning the total score of an *antisocial personality pattern* was found. However, in contrast to previous research (Bhutta & Wormith, 2016), this factor was unable to predict recidivism for offenders from Arab countries. This result suggests that either the measurement of antisocial personality is inadequate for Arab participants or personality is connected to delinquency in another way in Arab participants. Pointing in this direction, Dwairy (2002) states that personality is experienced differently in Arab societies. "Consequently, behavior and personality within collective societies could be better explained by external factors (norms, values, roles, and familial authority) than by intrapsychic structures and processes that have not been individuated." (Dwairy, 2002, p. 346).

Furthermore, most items of the *antisocial personality pattern* scale are conglomerates of items used in other scales of the LS/CMI, making it harder to examine core characteristics of antisocial personality patterns. Öncül (2008) thus challenged whether all antisocial personality traits really show predictive power for Turkish offenders. As a consequence of inconclusive evidence, further research should comprehensively investigate the role personality characteristics play for recidivism among Turkish or Arab offenders.

Criminal Attitudes

In line with our hypothesis, migrants from Turkey or Arab countries had a higher score concerning *criminal attitudes* compared to offenders without an MB. Potential frustration caused by difficulties in integration processes (Uslucan, 2012), a different value orientation (Arsovska & Verduyn, 2007), as well as varying attitudes towards the law (Bierbrauer, 1994), might be reflected in *criminal attitudes* as assessed by the LS/CMI. The manifold cross-cultural influences on the definition and construction of *criminal attitudes*, mentioned in the introduction, underline the necessity to evaluate potential cultural bias of a measurement. To compare the manifestation of *criminal attitudes* between groups and to use this construct to predict criminal behavior, appropriate item formulation and construct equivalence must be ensured (van de Vijver, 2003). Subsequently and in line with Bhutta and Wortmith (2016), the observed lack of predictive power of *criminal attitudes* for offenders with an Arab MB could indicate an inadequate item formulation. It could also reflect a present construct bias as Dahle and Schmidt (2014) suggested as an explanation of similar findings.

Antisocial Companions

In accordance with our hypothesis, offenders from Turkey or Arab countries had more criminal companions than German offenders without an MB, indicating a substantially higher risk of reoffending. This finding is in line with similar evidence for young offenders in Turkey (Icli & Coban, 2012). However, the correlation between the total score of the scale and different recidivism criteria was around zero for offenders with an MB. This might be due to the skewness of the distribution (cf. Gottfredson & Moriarty, 2006). A different manifestation of a variable, nevertheless, must not necessarily reflect disparity concerning validity. Hence, more research is required to test predictive validity for offenders with Turkish or Arab MB. Further research should also broaden the assessment of *criminal companions* and consider crime-friend relationships in more detail, which is shaped by time spend with friends, individual significance, and other familial and financial circumstances (cf. Icli & Coban, 2012). For this purpose, social network analyses (e.g., Weerman, 2011) adapted to a prison population might be a powerful approach for future studies.

Education and Employment

In line with our hypothesis, migrants from Turkey or Arab countries did score higher on the *education and employment* scale. Offenders with a Turkish or Arab MB are younger, live in more disadvantaged conditions (often without a work permission), and stem from less developed rural areas (Heath et al., 2008). Considering these socio-

structural differences raises the question of how appropriate these items are. For instance, does unemployment due to personal reasons have the same influence on delinquency as unemployment due to legal permissions? Consequently, it needs to be discussed if items should be operationalized differently considering diverging (legal) conditions for various subsamples within the same jurisdictions. Furthermore, this risk factor is assumed to be dynamic in nature (Andrews & Bonta, 2010). Thus, information about employment prior to incarceration might be less predictive, which could explain the lack of predictive power in this study. Hence, in future studies, *education and employment* should be assessed in more detail and in propinquity to the follow-up period.

Family and Marital Circumstances

Following assumptions inferred from cross-cultural psychology (e.g., Arends-Tóth & van de Vijver, 2008; Schwartz, 2006), offenders from Turkey or an Arab country had more satisfying relationships with their parents compared to Germans without an MB. At the same time, the rate of family members with a criminal record was much higher for offenders with a Turkish or Arab MB compared to offenders without an MB. Because these two indicators are summarized in one scale (Andrews & Bonta, 2010), the difference between groups on the scale-level was small. Thus, further research should consider different problems within this domain in a multi-layered way in Turkish or Arab communities. Dwairy (2002) suggests that not the personal feeling towards the relationship, but rather the social roles and norms connected to it, are the most relevant predictors of behavior. This highlights the need to assess the concept of familial risk in a culture-sensitive manner in the future (see also Eker, 2010).

Leisure

While we could partially support our hypothesis of a lower score concerning general leisure-related problems for offenders from Turkey compared to Germans without an MB, no correlation with recidivism could be reported for offenders with a Turkish MB and offenders without an MB, contradicting meta-analytic findings (Olver et al., 2014). Only among offenders with an Arab MB, the dichotomous assessment of *leisure* problems was correlated to general recidivism. However, the overall effect, reported by Olver et al. (2014), was small (r = .14) and as we only used one of the original 2-item-scale, this might have influenced the predictive power of *leisure*. Thus, further research is needed to investigate the role different aspects of *leisure* play for recidivism.

Alcohol and Drug Problems

As predicted, offenders with a Turkish and Arab MB had fewer alcohol problems compared to Germans without an MB, but no difference was found for drug problems (see also Brussaard et al., 2001). Despite the decreased manifestation of alcohol problems, moderate predictive values of the total score were found for all offenders regardless of their cultural background. As the psychopharmacological mechanisms of substance use (Dickinson, 2015) should be the same in every culture, the relationship to delinquency is supposed to be similar.

Limitations

As outlined, some phenomena concerning cross-cultural differences (e.g., the prevalence of alcohol problems) can already be explained with reference to findings from cross-cultural psychology, but not all. Within a retrospective study design, it is difficult to examine cultural influences as it is uncertain if the person who gathered the data was aware of these influences and no information about intercultural competence of the interviewer was present. Thus, culture-dependent attitudes (e.g., honor) could not be examined in the present study. A potential lack of intercultural competence might also affect the quality of data used to apply the *Central Eight* in this study, either because of an offender's superficial language proficiency or because of a tendency to withhold information because of feared stigmatization among migrants (cf. Shepherd & Lewis-Fernandez, 2016).

Our results suggest that file based methods in general could be a hindrance in assessing dynamic risk factors like *family and marital circumstances* because these methods require a detailed examination (cf. Andrews et al., 2004). Moreover, the data we used in this study was gathered at the beginning of imprisonment and dynamic risk factors may change during the imprisonment (cf. Labrecque, Smith, Lovins, & Latessa, 2014; Schlager & Pacheco, 2011). Thus, the predictive validity for recidivism after release might be lower compared to an assessment at the time of release. This could be an explanation of the generally low predictive values in the given study, especially with regard to dynamic risk factors.

In addition, the varying quality of data limits the validity of our findings. However, missing data is a common problem in criminology (Brame & Paternoster, 2003) and in this study multiple data imputation was used to avoid potential biases (cf. Gruenewald & Pridemore, 2012; Riedel & Regoeczi, 2004). Nevertheless, bias and reduced statistical power are unavoidable when data is missing, stressing the need to replicate these findings in the future.

Another shortcoming arises from potential confounding variables (e.g., age and type of offence, acculturation status). We found that differences concerning the manifestation of *education and employment* problems were confounded by age, but no other risk factor. However, it remains unclear whether the reported cross-cultural differences can also be explained by other structural differences of the groups beyond culture (cf. van de Vijver, 2003). For instance, it could be objected that the predictive accuracy of the *Central Eight* might in general be lower for drug offenders and drug offences were more prevalent among offenders from Arab counties. However, to our knowledge, present evidence does not suggest a lower predictive validity of the *Central Eight* for drug offenders compared to other offence types (e.g., Kelly & Welsh, 2008; Papp et al., 2016). In addition, Dahle and Schmidt (2014), investigating a sample of young offenders all incarcerated for serious violence offences, reported lower predictive validities for Muslim offenders compared to offenders without an MB. It might also be argued that the low predictive validity of the *Central Eight* for Arab offenders in this study might be due to a greater number of first-generation migrants in this group compared to offenders with a Turkish MB. However, Dahle and Schmidt (2014) addressed this issue and found no difference regarding the predictive validity between first- and second-generation offenders with MB.

Beyond that, it can be questioned if offenders from Lebanon and from North African countries really form one single cultural group despite general value orientations. Thus, further research should examine different subgroups of offenders in greater detail.

Furthermore, the reported differences in risk profiles and predictive validity might also be due to measurement inequalities (van de Vijver, 2003). However, measurement bias could not be examined in this study due to the dependencies of the LS/CMI items (cf. Andrews et al., 2004) and because the *Central Eight* are not designed to measure a latent variable (cf. Hanson, Babchishin, Helmus, & Thornton, 2013), which is a prerequisite for such analyses (Cooke, Michie, Hart, & Clark, 2005; Swaminathan & Rogers, 1990). This also illustrates the shortcomings of premises made by common risk assessment tools (Gottfredson & Moriarty, 2006) that are criterion-referenced

(Gutierrez, Helmus, & Hanson, 2016). This is especially true with regard to cross-cultural transferability. Hence, further research using different measurements of risk factors is needed.

Conclusion

Decisions based on risk assessments highly influence an individual's freedom as well as social security. Thus, reliably identifying particular risks and the confirmation of the predictive validity of such risk factors for different subgroups within a heterogeneous prison population is highly necessary (Hart, 2016).

This study demonstrated different risks and needs for offenders with a Turkish or Arab MB in comparison to German offenders without an MB. Findings can be linked to cultural aspects as well as migration stressors, highlighting the importance of cross-cultural issues in the field of psychology and law. Furthermore, the predictive power of the *Central Eight* was reduced for offenders with a Turkish MB and especially, for offenders with an Arab MB compared to German offenders without an MB. Suffering certain limitations, the present results do not allow a general conclusion about cultural bias. However, these findings are certainly alerting. Results of this study and similar ones (Dahle & Schmidt, 2014; Shepherd et al., 2015) raise reasonable challenge to the reliability and predictive validity of LS-Instruments for offenders who migrated to Europe from Turkey and Arab countries. This demonstrates the need for future cross-cultural research not only apply to the question *if* an instrument works, but also *how* it works, referring to a profound evaluation of potential bias using well-established methods (e.g., Cooke, et al., 2005; van de Vijver, 2003). Albeit the sparse evidence of cross-cultural transferability for Turkish and Arab offenders, risk assessment instruments like the LS/CMI are used for decision making in European jurisdictions. Moreover, also less strict Structured Professional Judgment (SPJ) assessment procedures build on risk factors like the *Central Eight* (cf. Hart & Logan, 2011). However, as long as there is no appropriate evidence directly confirming the reliability and validity of the *Central Eight* for offenders with a Turkish or an Arab MB, the continued use should be cautioned.

In addition, researching culture-sensitive risks as well as protective factors is required, even if no cross-cultural bias of assessment procedures is reported (Shepherd & Lewis-Fernandez, 2016; van der Put et al., 2013) because even a good instrument cannot explain all variance. In addition, the identification of an offender's personal characteristics should take cultural socialization into account, as the responsivity principle is essential for successful reintegration (Andrews & Bonta, 2010). To achieve a culture-sensitive approach in risk assessment and offender treatment, the formulation of culture-sensitive theories and cross-cultural research are indispensable. Therefore, we propose the application of cross-cultural evidence to criminal behavior (e.g., Jones et al., 2002) and the explicit testing of derived hypotheses for different subgroups of offenders.

Beyond that, risk assessment in an intercultural context faces additional hindrances. As this study illustrated, biographical variables, such as the *criminal history*, are hard to assess among first-generation migrants. Consequently, we recommend far greater focus on supplementary risk factors. For instance, crime scene information can provide sufficient insight for risk prediction (see Dahle, Biedermann, Lehmann, & Gallasch-Nemitz, 2014), and can thus be a powerful tool when biographical information is sparse and language barriers are present. Although evidence on cultural invariance of such instruments is sparse, a recent study provides promising results. Schmidt, Pettke, Lehmann, and Dahle (2017) examined 950 sexual offenders in Germany and found that in contrast to the actuarial tool Static-99R, a risk score based on crime scene behavior significantly predicted sexual recidivism among offenders with an MB from the Near East and North Africa.

Furthermore, intercultural competence seems necessary for an adequate assessment, not only to gain reliable information (Shepherd & Lewis-Fernandez, 2016), but also to assess them in a culture-sensitive manner. For instance, Turkish or Arab people more likely adhere to a collectivist value orientation (e.g., Hofstede, 2001). Thus, the broad inclusion of important others and social roles (cf. Dwairy, 2002) might complete the assessment.

In sum, we argue that a culture-sensitive approach in offender rehabilitation is needed, as otherwise the assessment, decisions, and interventions might be inadequate. Ignoring cross-cultural issues can affect public safety, the rights of people being evaluated, and restrict reliance as well as confidence in risk assessments in general (Hart, 2016).

Conflict of Interest

The authors of this article declare no conflict of interest.

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Notes

[1]The analysis was also run while controlling for the time of arrival, leading to equivalent results.

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