



Short communication

Risk-taking propensity and (un)healthy behavior in Germany

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ABSTRACT

Background: Earlier research in South Africa (Szrek et al., 2012) confirmed the one-item Dohmen measure (Dohmen et al., 2011) to be a significant predictor of risky health behavior.

Methods: The present study investigated the relationship of the Dohmen measure with other measures of risk-taking propensity (e.g., Domain-Specific Risk-Taking scale), and its predictive power for smoking, problematic drinking, problematic car driving, and problematic sexual behavior, in a sample of 63 patients of psychiatric clinics and 102 healthy participants in Germany.

Results: The Dohmen measure was significantly positively related to other involved instruments. It served as predictor of two of the four investigated risky health activities (i.e., smoking, problematic drinking).

Conclusions: The Dohmen measure seems to be a valid and time efficient instrument to assess general risk-taking propensity, as well as specific propensity for smoking and problematic drinking in Germany.

1. Introduction

Health risk behaviors, such as harmful alcohol consumption, often negatively impact physical and mental health (World Health Organization (WHO, 2006, 2014). Some individuals have a specific propensity for engaging in such behavior (De Haan et al., 2015; Mallpress et al., 2015). Early detection of risk-taking propensity and corresponding precautions may protect health. For example, individuals with an increased risk-taking propensity for problematic drinking may be involved in specific prevention programs (e.g., psychoeducation, corresponding methods of cognitive behavior therapy) that prevent them from developing the problematic behavior and from its negative consequences, such as alcohol use disorder, liver failure, and further physical and mental disorders. At an early stage (i.e., before the problematic behavior develops), these prevention programs are more success-promising than interventions at a later stage after the development of the problematic behavior (Ball, 2005; De Haan et al., 2015). Especially, adolescents who currently develop their (problematic) habits may profit from the early detection of risk-taking propensity and corresponding programs.

In 2012, Szrek et al. compared different risk-taking propensity measures in a sample of individuals, who visited study clinics for HIV testing in South Africa. Authors concluded that the one-item instrument developed by Dohmen et al. (2011), which measures general risk-taking

prosperity, serves as the best predictor of risky health behavior. Risky health behavior was defined as smoking, problematic drinking, non-use of a seatbelt when sitting in the front seat of a car, and risky sexual behavior such as not using a condom when having sex with changing partners. The Domain-Specific Risk-Taking scale (DOSPERT; Weber et al., 2002) that assesses risk-taking propensity in different domains had a lower predictive power than the Dohmen measure. Only its subscale, which focuses on risky health behavior, showed similar good results as the Dohmen measure. The Balloon Analogue Risk Task (Lejuez et al., 2002) – a computer task often used to measure risk-taking propensity (Reynolds et al., 2014) – was unrelated to risky health behavior.

Even though Szrek et al. (2012) found that the Dohmen measure is a valid predictor of risky health behavior, this short instrument received little research interest. It remains unclear whether the findings gained from a specific sample in South Africa may be generalized to other countries and groups. This knowledge seems to be of particular interest, considering that previous studies from various countries demonstrated risky health behavior such as problematic drinking, risky driving that causes a high percentage of car accidents, or unprotected sex that significantly increases the risk for sexually transmitted diseases, to contribute to a high mortality rate (Christophersen and Gjerde, 2014; De Haan et al., 2015; Hall et al., 2015; Mahy et al., 2014; Peacock and Bruno, 2015). According to the World Health Organization, worldwide

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tobacco use yearly causes the death of over 7 million people (World Health Organization (WHO, 2018), problematic alcohol use causes over 3.3 million deaths annually (World Health Organization (WHO, 2014), and over 1.25 million people die yearly because of road traffic incidents (World Health Organization (WHO, 2015). Furthermore, more than 1 million sexually transmitted infections are acquired daily, and contribute to increased probability, for example, for cervical cancer and neonatal death (World Health Organization (WHO, 2016). Therefore, it seems reasonable to further investigate the Dohmen measure as a time efficient and economical predictor of risky health behavior. Its use may have clear advantages in a large range of applications (e.g., clinical setting where patients often have a low attention span, long online surveys, cross-cultural and longitudinal studies). Therefore, the current study aimed to investigate the Dohmen measure in a group of healthy participants and in a group of inpatients of psychiatric clinics who were earlier described to engage in a high level of risky health behavior (Kilian et al., 2006; Scott and Happell, 2011; Strine et al., 2008), in Germany. Its relationship with other risk-taking propensity measures should be considered. To expand the investigation from South Africa, additionally to the measures used by Szrek et al. (2012; i.e., DOSPERT, BART), the Sensation Seeking Scale (SSS-V; Beauducel et al., 2003), which has been found to be a valid predictor of risky health behavior (Franques et al., 2003; Maher et al., 2015; Zuckerman, 2014), was included as a further risk-taking propensity measure. The SSS-V measures the personality trait sensation seeking that describes the tendency to seek varied, novel, complex and intense experiences and therefore to engage in risky health behavior, such as risky driving or risky sexual behavior (Zuckerman, 1984, 1994). Furthermore, the predictive power of the Dohmen measure for risky health behavior (i.e., smoking, problematic drinking, problematic car driving, problematic sexual behavior) should be investigated.

Thus, the general aim of the present study was to investigate whether the Dohmen measure may be used as a brief instrument to assess risk-taking propensity.

2. Materials and methods

2.1. Procedure and participants

In total, the sample of the current correlational study comprised 165 participants from the Ruhr region in Germany: 1. Patient subsample: 63 inpatients of two psychiatric clinics (age range: 18–66). According to the medical records of the clinics, the most common diagnosis was major depression (74.6%), followed by alcohol use disorder (14.3%), and panic disorder (11.1%). The participants' mean number of inpatient clinical stays was $M = 4.63$ ($SD = 5.34$; range: 1–33). 2. Non-patient subsample: 102 participants (age range: 18–80; never treated at a psychiatric clinic, no psychiatric diagnoses; both were conditions for participation in this sample). Table 1 presents the demographic data of both subsamples. Non-patient respondents were recruited by participation invitations displayed in public places, like bakeries. Inpatients were invited to participate by their physicians at the clinic. In both samples, conditions for participation that was voluntary and not compensated were legal age according to the German law (i.e., at least 18 years), sufficient knowledge of the German language to understand the instructions, no neurological disorders or current intake of medication which might disturb or distort the performance, especially on the BART. All participants met these conditions. Data were collected from January to April 2016 by a paper-and-pencil survey and a computer task (BART; Lejuez et al., 2002) at the clinics (inpatients) and in the university laboratory (non-patients). The responsible Ethics Committee approved the implementation of the current study (number of approval: 210). Participants were properly instructed and provided written informed consent to participate.

2.2. Measures

2.2.1. Risk-taking propensity measures

The Dohmen measure (Dohmen et al., 2011) assesses general risk-taking propensity by the item “How do you see yourself: are you generally a person who is fully prepared to take risks or do you try to avoid taking risks?” rated on a scale ranging from “not at all willing to take risks” (= 0) to “very willing to take risks” (= 10).

The Domain-Specific Risk-Taking Scale (DOSPERT; Weber et al., 2002) consists of 40 items divided to six domains (subscales) of risk: financial investing, gambling, health/safety, recreation, ethics, and social behaviors. Respondents rate their likelihood to engage in a specific risk behavior on a 5-point Likert-scale (1 = *extremely unlikely*, 5 = *extremely likely*). The overall level of risk-taking propensity (DOSPERT-general; current reliability: patients: Cronbach's $\alpha = .91$, non-patients: $\alpha = .88$) and the level of risk-taking in the domain health/safety (DOSPERT-health/safety; eight items, e.g., “engaging in unprotected sex”; current reliability: patients: $\alpha = .68$, non-patients: $\alpha = .68$) were considered.

In the 30 trials of the Balloon Analogue Risk Task (BART; Lejuez et al., 2002), participants were presented a red uninflated balloon at a computer screen. The balloon was inflated by clicking (“pumping”) on a button beyond. With each click, five virtual eurocents were accrued in a temporary bank also presented at the screen (“Potential Earned”). Participants were instructed that the balloons vary in their probability of exploding (from “after the first pump” to “the point at which the balloon fills the entire screen”), that after an explosion, all money in the temporary bank is lost, and that at any time they can transfer the earned money from the temporary to the permanent bank presented at the screen (“Total Earned”) by clicking on the “collect-button”. After each transfer, a new trial started. Explosions were accompanied by an explosion sound effect and money transfer was accompanied by a slot machine payoff sound effect. Total earnings were not paid to the participants. Following Lejuez et al. (2002), the adjusted number of pumps across all trials (i.e., average number of pumps on non-exploded balloons) served as risk-taking propensity.

The Sensation Seeking Scale, Form V (SSS-V; Beauducel et al., 2003) assessed sensation seeking with 40 forced-choice format items (0 = *low sensation seeking*, e.g., “I prefer quiet parties with good conversation”; 1 = *high sensation seeking*, e.g., “I like ‘wild’ and uninhibited parties”; current reliability: patients: $\alpha = .74$, non-patients: $\alpha = .82$).

2.2.2. Self-reported risky behavior

Following Szrek et al. (2012), self-reported risky behavior was assessed in four domains: “Smoking”: “Do you currently use any tobacco products, such as cigarettes?” (0 = *no*, 1 = *yes*); “Problematic drinking”: function of three items of the Alcohol Use Disorders Identification Test (AUDIT-C; Bush et al., 1998) rated on a 5-point Likert-scale that assess number of drinks containing alcohol consumed on a typical day. A critical score that indicates problematic drinking is reached by a sum of five points for men and of four points for women (0 = *critical score not reached*; 1 = *critical score reached*); “Problematic car driving”: function of two items assessing, whether a seat belt was used the last time the participant traveled by car (as driver or not) and whether the participant tends to speed when driving a car (0 = *no*, 1 = *yes*; all participant had a driving license); “Problematic sexual behavior”: function of two items assessing, whether the participant has no regular partner and did not use a condom during the last sexual intercourse, and whether the participant is married or had a romantic partner for the last 12 months and had more than one sexual partner during this time period (0 = *no*, 1 = *yes*).

2.3. Study design and statistical analyses

The present study used a correlational design, which included the self-reported risk-taking propensity measures (i.e., Dohmen measure,

Table 1
Demographic data, Descriptive statistics and correlations of risk-taking propensity measures.

	Patients (n = 63)					Non-Patients (n = 102)						
	%	M(SD)	(2)	(3)	(4)	(5)	%	M(SD)	(2)	(3)	(4)	(5)
Gender (women)	57.1						66.7					
Age		39.21(13.02)						31.13(14.08)				
Occupation:												
University students	7.9						53.9					
School students	4.8						2					
Trainees for different professions, like baker	3.2						2					
Employees	42.9						34.3					
Retirees	22.2						2.9					
Unemployed	19						4.9					
Marital status:												
Single	49.2						30.4					
With romantic partner	23.8						51					
Married	27						18.6					
(1) Dohmen measure		5.27(2.24)	.43**	.35**	-.03	.34**	4.80(1.96)	.56**	.42**	.17 ^(*)	.60**	
(2) DOSPERT-general		2.27(.60)		.80**	.15	.64**	2.47(.49)		.77**	.10	.75**	
(3) DOSPERT-health/safety		2.39(.78)			.15	.64**	2.45(.67)			-.02	.61**	
(4) BART		20.68(11.05)				.35**	28.59(11.51)				.08	
(5) SSS-V		17.10(6.04)					18.94(6.58)					

Notes. M = Mean; SD = Standard Deviation; DOSPERT = Domain-Specific Risk-Taking scale, BART = Balloon Analogue Risk Task, SSS-V = Sensation Seeking Scale, Form V. ^(*)p < .10, ^(**)p < .01.

DOSPERT-general, DOSPERT-health/safety, BART, SSS-V) as independent variables and the self-reported risky behavior assessments (i.e., “smoking”, “problematic drinking”, “problematic car driving”, “problematic sexual behavior”) as dependent variables. Statistical analyses were conducted with the Statistical Package for the Social Sciences (SPSS 24). Associations between risk-taking propensity measures were assessed by zero-order bivariate correlations. Following Szrek et al. (2012), logistic regression analyses investigated the ability of each of the risk-taking propensity measures in predicting self-reported risky behavior. Each risky behavior (dependent variable: 0, 1) was regressed on the different risk-taking propensity measures (independent variables; one at a time, each in a separate regression) controlling for age, gender, occupation and marital status in both subsamples, and for diagnosis and number of inpatient clinical stays in the patient subsample. A priori power analyses revealed that the sample sizes were sufficient for valid results (power ≥ 0.80, α = .05, effect size f² = 0.15; Cohen, 1988).

3. Results

In both subsamples, the Dohmen measure was significantly positively related to the other measures of risk-taking propensity (see Table 1).

Table 2 presents the results of the logistic regression analyses. The Dohmen measure predicted “smoking” in both subsamples, and “problematic dinking” in the patient subsample. In both subsamples, the DOSPERT-general and the DOSPERT-health/safety predicted “smoking” and “problematic drinking.” Additionally, the DOSPERT-health/safety predicted “problematic car driving” in the patient subsample. The BART did not predict risky behavior. The SSS-V predicted “problematic drinking” (patient subsample) and “smoking” (non-patient subsample).

4. Discussion

The present study investigated the Dohmen measure (Dohmen et al., 2011) in Germany that has been found to be a time efficient instrument to assess risk-taking propensity for different categories of risky health behavior in South Africa (Szrek et al., 2012).

In accordance with Szrek et al. (2012) and Dohmen et al. (2011), the Dohmen measure predicted smoking in the patient and non-patient subsample, and problematic drinking in the patient subsample.

However, in contrast to Szrek et al. (2012), it was not suitable to predict problematic car driving and problematic sexual behavior. While Szrek et al. (2012) found the DOSPERT-general to predict only smoking, in the current study, this instrument was a significant predictor of problematic drinking. Similar to the results from South Africa, the DOSPERT-health/safety significantly predicted smoking, problematic drinking and car driving. Previous research revealed inconsistent results, due to the predictive power of the BART. While Lejuez et al. (2002) and Reynolds et al. (2014) found this instrument to significantly predict smoking and problematic drinking, in other studies (e.g., Dean et al., 2011; Szrek et al., 2012), as well as in the current study, the BART showed no predictive results. Sensation seeking significantly predicted smoking and problematic drinking.

Thus, present results partly replicated the findings of Szrek et al. (2012) for inpatients and non-patients in Germany. Due to its significant positive association with the other involved instruments, the Dohmen measure is suitable as a brief screening to detect general risk-taking propensity. Furthermore, this instrument is suitable to predict some specific risky health activities, such as smoking and problematic drinking. Considering that such risky health activities have been found to be positively linked to mental and physical disorders (Scott and Happell, 2011; Strine et al., 2008), the knowledge about the corresponding propensity may be of high relevance in clinical samples or in assessment centers. Thus, in clinical samples, risky health behavior may negatively impact the course of treatment in the patient population. Therefore, if it is known at the early stage of the treatment that a patient has an increased propensity for risky health behavior, the treatment can be adapted correspondingly, which may contribute to the improvement of the health status of the individual. In assessment centers that are typically used to determine the suitability of candidates for specific types of employment, such knowledge may be useful for the selection process. For example an increased propensity for problematic alcohol use of a candidate may negatively influence job performance; therefore, another participant with a lower propensity for such risky health behavior would be selected.

Due to its shortness, the Dohmen measure seems to be a suitable instrument for research and practice. The use of this instrument may prevent fatigue, motivation problems, and therefore drop-out by participants – a well-known problem, especially in cross-sectional studies that assess a wide range of constructs, in longitudinal studies with several measurement time points, and in studies that investigate clinical

Table 2
Descriptive statistics of risk-taking behavior and logistic regression analyses.

	“Smoking”	“Problematic drinking”	“Problematic car driving”	Problematic sexual behavior”
<i>Patients (n = 63)</i>				
<i>Descriptive Statistics: %</i>	63.5%	31.7%	36.5%	38.1%
<i>Regression analyses: OR with p, 95% CI</i>				
Model 1: Dohmen measure	1.34 ^(*) , .98–1.82	1.29 ^(*) , .96–1.75	1.20, .92–1.58	1.23, .92–1.63
Model 2: DOSPERT-general	3.77 ^(*) , .95–14.97	3.25 [*] , 1.07–9.88	1.98, .67–5.83	1.70, .60–4.78
Model 3: DOSPERT-health/safety	2.33 ^(*) , .89–6.09	3.76 ^{**} , 1.39–10.21	2.74 [*] , 1.05–7.17	1.71, .74–3.94
Model 4: BART	.97, .92–1.01	1.01, .97–1.06	1.00, .96–1.04	1.02, .97–1.06
Model 5: SSS-V	1.02, .92–1.13	1.22 ^{**} , 1.06–1.40	1.07, .97–1.18	1.09, .97–1.22
<i>Non-Patients (n = 102)</i>				
<i>Descriptive Statistics: %</i>	19.6%	37.3%	61.8%	19.6%
<i>Regression analyses: OR with p, 95% CI</i>				
Model 1: Dohmen measure	1.33 ^(*) , .96–1.84	.96, .76–1.22	.99, .78–1.26	1.04, .77–1.41
Model 2: DOSPERT-general	3.91 [*] , 1.02–15.02	3.24 [*] , 1.11–9.46	1.18, .42–3.34	.44, .11–1.77
Model 3: DOSPERT-health/safety	6.50 ^{**} , 2.06–20.55	4.10 ^{**} , 1.64–10.20	.82, .38–1.77	.65, .24–1.77
Model 4: BART	1.01, .97–1.05	1.01, .98–1.05	1.03, 1.00–1.07	.98, .94–1.03
Model 5: SSS-V	1.18 ^{**} , 1.05–1.32	1.06, .99–1.14	1.04, .96–1.11	.97, .89–1.07

Note. OR = Odds Ratio, p = significance, CI = Confidence Interval; DOSPERT = Domain-Specific Risk-Taking scale, BART = Balloon Analogue Risk Task, SSS-V = Sensation Seeking Scale, Form V. All participants had a driving license. Regressions: both subsamples: all models include: age, gender, marital status, occupation; additionally, patient subsample: all models include: diagnosis, number of inpatient clinical stays. ^(*)p < .10, ^{*}p < .05, ^{**}p < .01.

patients with a small attention span. Also, studies using the experience sampling paradigm may benefit from the shortness of the Dohmen measure to prevent participants’ overload.

A limitation of the present study is its small sample size, especially in the patient group, in comparison to earlier research on risky health behavior. Thus, to become significant, the predictive power of the investigated measures must be large to be detected. Nevertheless, some effects, such as the significant prediction of the DOSPERT-health/safety for problematic car driving, were found only in the patient group.

Furthermore, it should be considered that inpatients are more restricted in their behavior than individuals who do not stay at a clinic. Therefore, the level of reported risky health behavior, specifically problematic drinking, might be underestimated in the inpatient sample.

Additionally, it is important to note that, despite its advantages, in the current study, the Dohmen measure was not able to predict all investigated forms of risky health behavior. Therefore, research that investigates the propensity for problematic car driving and problematic sexual behavior is advised to use more domain specific instruments.

In conclusion, the current results complement previous research showing that the Dohmen measure is suitable to assess general risk-taking propensity and specific propensity for smoking and problematic drinking not only in South Africa, but also for non-patients and clinical inpatients in Germany. Future studies should investigate the predictive power of this time efficient measure for further risky health behavior, such as drug use and risky sportive activities.

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Contributors

All authors reviewed and approved the final manuscript. Julia Brailovskaia, Holger Schillack and Jürgen Margraf conducted the study design. Julia Brailovskaia wrote the draft of the article, and conducted statistical analysis. Julia Brailovskaia, Holger Schillack, Hans-Jörg Assion and Helmut Horn contributed to the data assessment and data preparation.

Conflict of interest

No conflict declared.

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