Assessing the gendered general strain theory over time in individuals with a residential care history

Habersaat, S.; Urben, S.; Palix, J.; Bürgin, D.; Fegert, J.M.; Schmeck, K.; ... ; Schmid, M.

DEVIANT BEHAVIOR
https://doi.org/10.1080/01639625.2023.2255918

Routledge
Taylor & Francis Group

Assessing the Gendered General Strain Theory Over Time in Individuals with a Residential Care History

Stéphanie Habersaat[a*], Sébastien Urben[b*], Julie Palix[b], David Bürgin[a,c], Jörg M. Fegert[c], Klaus Schmeck[a], Cyril Boonmann[a,d*], and Marc Schmid[a*]

[a]Psychiatric University Hospitals Basel (UPK), University of Basel, Basel, Switzerland; [b]University Hospital of Lausanne (CHUV) and University of Lausanne, Lausanne, Switzerland; [c]University Hospital of Ulm, Ulm, Germany; [d]Psychiatric University Hospitals Basel (UPK), Basel, Switzerland

ABSTRACT

The gendered general strain theory posits that differences in delinquency across gender are due to differences in coping with negative emotions. The present study tests its validity over a 10-year follow-up. We measured exposure to strain, levels of anxiety/depression, anger/irritability, and delinquent behaviors through questionnaires and interviews during residential care (T_1) and then 10 years later (T_2) in a sample of 80 men and 54 women who were placed in youth welfare and juvenile justice institutions in Switzerland during childhood/adolescence. We observed that, in men, less delinquency at T_1 and more symptoms of anxiety/depression at T_1 are related to less delinquency at T_2. In women, none of the emotional variables nor strain predicted delinquency over time. Results give important insights regarding the risk factors related to long-term delinquency in men but only partially support the gendered general strain theory.

ARTICLE HISTORY
Received 17 May 2023
Accepted 1 September 2023

Introduction

In Switzerland, official data report that a third of sentenced adolescents and a quarter of sentenced adults, between 1984 and 2014, were women (Office fédéral de la statistique 2015). For the year 2019, one-third of all offenses registered by the police were perpetrated by women (Office fédéral de la statistique 2020), illustrating a constant lower rate of women involved in criminal behaviors compared to men.

One of the most acknowledged criminal theories explaining the gender gap in offending derives from Agnew's general strain theory (GST; Agnew 1992, 2001, 2003, 2006; Broidy and Agnew 1997), which emphasized the role of negative emotions such as anger, anxiety, or depression in the understanding of delinquent behavior. According to the GST, strain (i.e., adversity and stressful life events), especially when it is considered unfair, serious, or related to low control over the situation, triggers negative emotions. When an individual lacks coping resources and skills, responses to strain and negative emotions may be inappropriate (i.e., delinquent, self-destructive, and violent behaviors) (Agnew 1992, 2006). The gender gap in criminality is thus thought to result from gender differences in types of strain (strain experienced by men is more conducive to violence and crime, while strain experienced by women is more conducive to family and self-directed violence), in emotional response to strain, and in coping with emotions (men are more likely to respond to strain and anger with violence and crime because of differences in social support, social control, and opportunities) (Broidy and Agnew 1997). In terms of emotional responses to strain, although both men and women can

CONTACT Stéphanie Habersaat Stephanie.Habersaat@upk.ch Child and Adolescent Psychiatric Research Department, Universitäre Psychiatrische Kliniken (UPK) Basel, Wilhelm Klein-Strasse 27, Basel 4002
*Shared co-authorships

experience anger in response to strain and that anger has been directly linked to delinquent behavior, it is suggested that women also experience a range of other emotions simultaneously, such as anxiety, depression, fear, guilt, or shame, more intensely and more frequently than men (Baek et al. 2019; Manasse, João Lobo Antunes, and Ganem 2020; Moon and Morash 2017; Sigfusdottir, Farkas, and Silver 2004; Yun, Kim, and Morris 2014). These mixed emotions may act as a buffer against anger-related externalized responses such as violent and delinquent behaviors (Broidy and Agnew 1997; Posick, Farrell, and Swatt 2013). In addition, the presence of negative emotions such as fear or shame in women may direct violent responses toward themselves rather than others (Posick, Farrell, and Swatt 2013).

Results of many studies in different community samples were generally in line with the gendered GST (Glassner and Cho 2018; Iratzoqui 2020; Jang 2007; Kaufman 2009; Keith et al. 2015; Liu 2021; Manasse, João Lobo Antunes, and Ganem 2020; Sigfusdottir, Farkas, and Silver 2004; Watts and McNulty 2013; Yıldız and Solakoglu 2019). For instance, a study by Hartinger-Saunders et al. (2019), investigating a community sample of adolescent and young adult men, found that individuals with higher exposure to strain (victimization) generally showed more guilt than those who experienced less exposure to strain. However, those who experienced more strain but showed delinquent behaviors reported less guilt than those not showing delinquent behaviors, suggesting that guilt acted as a buffer between strain and delinquency in men, similarly as it did in women (Hartinger-Saunders et al. 2019). In a large representative community sample of Korean adolescents, Kim et al. (2021) showed that, in boys, more depressive symptoms but not anger predicted more delinquent behaviors, while, in girls, more anger but not depressive symptoms was related to more delinquent behaviors. Going further, a study by De Coster and Zito (2010) found that depressive symptoms in addition to anger increased the probability of displaying delinquent behaviors in boys. The authors thus suggested that boys and girls may similarly feel a range of negative emotions when confronted with strain but that their way of expressing and coping with these emotions differed (De Coster and Zito 2010). Indeed, social gender display rules encourage the externalization of negative emotions in boys (through valorization of competition, risk-taking, and aggressiveness), while in girls, the internalization of negative emotions is encouraged (through valorization of submission, passivity, and discretion) (Brody 1997; see also Keith et al. 2015; Moffitt et al. 2001; Kim et al. 2021). A study by Dolliver and Rocker (2018) found that it was not biological sex but rather masculine gender identity that conditioned risks for delinquent behaviors. In the same vein, another recent study in a sample of community women stated that the relationship between strain, negative emotions, and deviant behavior was related to the internalization of feminine versus masculine norms, the latter being more at risk for responding to strain and negative emotions with delinquent behaviors (Scott, Deena, and Mikell 2019). It can thus be assumed that, general women or individuals identifying themselves as women, when confronted with strain, develop a large array of mixed feeling that may dampen the externalizing effect of anger but also deal with and express their emotions differently than individuals identifying as men. However, it is not clear whether this co-occurrence of multiple negative emotions (especially depression) could also protect men from displaying externalizing behaviors when facing strain as suggested by Hartinger-Saunders et al. (2019) or increase the probability of displaying such behaviors as shown in De Coster and Zito (2010) and Kim et al. (2021)'s study.

Although gendered GST theorizes why fewer women display delinquent behaviors, it is not clear whether women displaying delinquent behaviors would differ from men presenting delinquent behaviors in terms of emotional display and coping. However, to our knowledge, studies investigating gender differences in delinquent behaviors according to the GST in samples of individuals who committed offenses or at least at-risk samples are scarce and replication studies are missing. For instance, Piquero and Sealock (2004) found that exposure to strain and anger regulation problems, but not symptoms of depression, explained delinquent behavior in boys and in girls with substance use problems. As suggested by Scott, Deena, and Mikell (2019), Piquero and Sealock (2004), thus, confirmed that delinquent girls are similar to boys in terms of emotional response to strain and therefore different from non-delinquent girls. A previous study

by our team, in an at-risk sample (i.e., institutionalized adolescents), found that higher levels of strain and higher levels of anger explained higher levels of delinquent behaviors both in girls and in boys but that the relation between anger and delinquent behaviors was significantly stronger in girls than in boys (Habersaat et al. 2020). Furthermore, our results showed that depression symptoms worked as a buffer against delinquent behaviors, but only in girls. These results were in line with the GST concerning gender differences in community sample as well as with Piquero and Sealock (2004)'s study; that is, (1) depression/anxiety protects angry women from delinquent behaviors and (2) angry women showing less depression/anxiety symptoms report more delinquent behaviors, suggesting that delinquent women are closer to men in emotional response to strain.

Previous studies were conducted mainly using cross-sectional design (or short longitudinal design), leaving unexplored the predictability of the gendered GST over a longer period of delinquent behaviors in men and women, especially in relation to changes in negative emotions over the years. Indeed, while the gendered GST suggests that differences in emotional response to strain explain the gender gap in delinquent behaviors, it is not clear if changes in emotional response to strain over the years may lead to desistance versus persistence of delinquent behaviors in women and men. Although there is a well-known reduction of delinquent behaviors between adolescence and young adulthood (see for instance Villeneuve, Dufour, and Turcotte 2019; Weaver 2019), it is not known if this reduction of problematic behavior is related to an alleviation in negative emotions and if gender may play a role in this process.

The current study aims at testing predictions of the gendered GST over a 10-year follow-up time. More specifically, the present study aims at testing if the association between anxiety/depression symptoms and anger/irritability is different among genders and how this association is linked to delinquency over time. Second, it aims at testing if changes in the association between negative emotions (i.e., anger-irritability and depression-anxiety) over time relate to changes in delinquent behaviors.

Materials and methods

Participants and procedure

The current study is embedded in the "Youth welfare trajectories: learning from experience" ("Jugendhilfverlaüfe: Aus Erfahung lernen" [JAEL]) study, the 10-year follow-up study of the "Clarification and Goal-Attainment in Child Welfare and Juvenile-Justice Institutions" ("Modellversuch zur Abklärung und Zielerreichung in stationären Massnahmen" [MAZ.] (see Schmid et al. 2013), a study conducted from 2007 to 2011 in Switzerland. The MAZ. study is a large-scale investigation of psychological and behavioral characteristics of children, adolescents, and young adults institutionalized in Switzerland under the criminal (e.g., completion of a sentence following a serious offending behavior) or civil law (e.g., runaway, victimization, minor offenses, harmful family environment) or by "voluntary placement" (e.g., repeated relational and behavioral problems within the family). In total, 592 children and adolescents from 64 Swiss child welfare and juvenile justice institutions were included. Their age at baseline varied from 6 to 26 years old. While not being strictly a sample of delinquent individuals (not all have been placed in institution following a severe offense), the sample including adolescents in juvenile justice and youth welfare institutions is very vulnerable in terms of exposure to multiple strain (previous exposure to family violence, neglect, parental psychiatric illness, or addictive behaviors, and stress in institution related to the lack of intimacy, difficulties with peers, and a high turnover in institution staff). Many of these children display antisocial behaviors from an early age, such as theft, violence, substance use, emotional outburst, runaway, truancy, and psychological difficulties. Furthermore, adolescents placed by the criminal justice and those placed by the civil justice are often mixed in the same institutions exposing the younger to older delinquents, who may exert a negative influence on them.

JAEL (a follow-up study) started in 2016, approximately 10 years after MAZ. One of the main objectives of JAEL was to re-assess these now adults, focusing on how they coped with the transition from institution to autonomous living conditions. Of the total MAZ. sample, 511 individuals agreed to be contacted in the future in case of a follow-up study. Potential participants were contacted through information letters or by phone or e-mail, in which the study protocol was explained in detail. Among the 511 participants, 137 could not be reached (no trace found = 8; dead = 8; and never answered our solicitations = 121). Of the 374 participants reached, 231 agreed to take part in the follow-up study. They received an e-mail with a personal link to online questionnaires concerning psychological symptoms, life events, and quality of life. When all questionnaires were completed ($n = 203$), participants were invited for a 1- to 2-day assessment at the university psychiatric hospital in Basel (German-speaking participants), in the university psychiatric hospital in Lausanne (French-speaking participants), or in the regional hospital and in the psychosocial services in Lugano (Italian-speaking participants). During the assessment, semi-structured interviews evaluating their general situation, psychological functioning, symptoms and diagnostics, and history of trauma were conducted. In total, 180 participants completed all assessments. For the present study, to limit the sample heterogeneity in terms of age and status in JAEL, we only included participants who were in early adolescence to early adulthood (10–20 years old) at the MAZ. study. Therefore, all participants were out of school/juvenile institutions at JAEL. The final sample was then composed of 54 women and 80 men. The procedure was approved by the Ethics Committees for Research on Human in Basel and Vaud states in Switzerland. All participants received oral and written information about the study, and their informed consent was obtained online and during face-to-face interviews.

Data collected during the MAZ. study are identified as T_1 and data collected during the JAEL study (10-year follow-up from MAZ.) as T_2. Women included in the JAEL study (T_2) and those who dropped out after MAZ. did not differ in terms of age at the first assessment or nationality but were more often placed in institution following a criminal sentence ($p = .031$). Furthermore, women included in the JAEL study (T_2) showed significantly more exposure to strain at T_1 ($t(118) = 3.02$; $p = .003$) and presented more delinquent behaviors at T_1 ($t(118) = 2.02$; $p = .045$), more anger/irritability ($t(118) = 3.93$; $p < .001$), and more anxiety/depression ($t(118) = 3.44$; $p = .001$) at T_1 compared to women who dropped out. Men included in the JAEL study (T_2) and those who dropped out neither differed significantly in terms of age at the first assessment nor in terms of reason for placement. However, those who participated in the follow-up study (T_2) were more often of Swiss nationality ($p = .016$) than those who dropped out.

Measures

Sociodemographic and control variables such as age at assessment, gender, reasons for institutionalization at MAZ., nationality, and socioeconomic information were collected during the online questionnaires and the interviews at T_2.

Exposure to strain, anger/irritability, and anxiety/depressive symptoms were assessed at T_1 and T_2 using the Massachusetts Youth Screening Instrument-Second version (MAYSI-2; Grisso and Barnum 2000), a 52-item screening questionnaire for mental health problems. Participants respond (yes = 1 or no = 0) whether the item applied to them in the last month. Items are added to form seven subscales, including "Stress and trauma" (five items; Strain), "Anger/irritability problems" (nine items; Cronbach's $\alpha > .78$), and "Anxiety/depressive symptoms" (nine items; Cronbach's $\alpha > .73$). The "Stress and trauma" subscale includes a list of potentially traumatic events such as "Have you ever in your whole life had something very bad or terrifying happen to you?" or "Have you ever been badly hurt or been in danger of getting badly hurt or killed?." The anger-irritability problems scale describes excessive anger or anger-related affects such as vengeance, frustration, and tension through items such as "Have you thought a lot about getting back at someone you have been angry at?" or "Have you felt angry a lot?". The anxiety/depressive symptoms subscale assesses symptoms of anxiety and depression

through items such as "Have nervous or worried feelings kept you from doing things you want to do?" or "Have you felt that you don't have fun with your friends anymore?."

Self-reported delinquent behavior was measured at T_1 and T_2 by the subscale "delinquent behavior" of the Youth Self Report (YSR; Achenbach 1991) for adolescents aged 11–18 years old and of the Young Adult Self Report (YASR; Achenbach and Edelbrock 1987) for participants over 18 years old (in MAZ. and JAEL studies), respectively, using 120-item and 132-item self-report questionnaires investigating emotional and behavioral problems over the past 6 months. The "delinquent behavior" subscale is composed of nine items investigating age-appropriated delinquent behaviors such as truancy, theft, threatening, fight, attack others, and lack guilt. Participants had to answer statements using a three-point Likert-type scale ranging from 0 = not true to 2 = very true or very often true. The subscale total score is computed by summing scores per item. Scores were transformed into T-scores to merge scores from the YSR and the YASR versions into the same variable. Cronbach's α was >.75. These questionnaires are widely used and have been validated many times in different languages, showing good psychometric properties (see www.aseba.com).

Data analyses

To check the comparativeness of men and women at T_2 in terms of sociodemographic variables, we computed *t*-tests or χ^2 tests in function of the variables (i.e., continuous or categories). Then, we performed repeated-measure analyses of variance (RM-ANOVAs) to assess gender and time effects on the main variables of interest. Afterward, to test the gendered GST over time, we assessed the moderating role of negative emotions between strain and delinquency (and their changes) over time. We computed two moderation models, separately by gender, the first investigating the impact of strain, anger/irritability, anxiety/depression, and the interaction between these two last variables at T_1, on delinquency at T_2, and controlling for age and delinquency at T_1. The second model investigated changes in strain (the change was assessed by subtracting T_1 scores from T_2, a higher score indicating a worsening of symptoms; the change was identified as "delta" in tables), changes in anger/irritability, and changes in anxiety/depression, as well as the interaction between these two last variables predicting changes in delinquency between T_1 and T_2, controlled by age.

Results

Comparisons by gender on sociodemographic variables at T_2

No significant difference was found between women and men at T_2 in terms of sociodemographic factors, except that women were significantly more likely to have children than men ($\chi^2 = 10.51$; $p = .001$) and were more often economically depending on disability insurances ($\chi^2 = 7.84$; $p = .005$) compared to men (see Table 1).

Gender by time comparison in clinical data

The results of the RM-ANOVAs are reported in Table 2. We observed higher scores for women compared to men for all variables ($ps \leq .036$). A significant reduction over time is observed for strain, anger/irritability, and delinquency ($ps \leq .004$). In addition, the gender by time interaction is significant for anxiety/depression ($F(1, 114) = 6.87$, $p = .011$). Post hoc analyses revealed higher scores for women at all assessments as well as a reduction in anxiety/depression in women ($p = .008$) but not in men ($p = .446$) from T_1 to T_2.

Moderation models

We computed regression analyses modeling delinquent behaviors at T_2 by age, delinquent behaviors at T_1, and strain, anger/irritability, anxiety/depression, and the interaction between anxiety/depression

Table 1. Sociodemographic and clinical information comparison by gender at T_2.

	Women	Men	*p*
N (%)	54	80	
Age at T_2	25.3(1.9)	25.3 (2.8)	*ns*
Civil status			*ns*
Single	48 (88.9)	75 (93.8)	
Married/partnership	3 (5.6)	3 (3.8)	
Divorced/separated	3 (5.6)	2 (2.5)	
Children (yes)	17 (33.3)	8 (10.3)	.001
Birth country			*ns*
Switzerland	42 (77.8)	71 (88.8)	
European Union and United Kingdom	4 (7.1)	2 (2.5)	
Others	8 (14.8)	7 (8.8)	
Current living conditions			*ns*
Family/friends	32 (62.7)	47 (59.5)	
Alone	18 (35.3)	29 (36.7)	
Institution/prison	1 (2.0)	2 (2.5)	
Other	0	1 (1.3)	
Higher education degree achieved			*ns*
Mandatory school not finished	1 (2.0)	4 (5.1)	
Mandatory school	15 (29.4)	23 (29.1)	
Apprenticeship	24 (47.1)	44 (55.7)	
Higher education	11 (21.6)	8 (10.1)	
Income			
Employment/schooling/apprenticeship	23 (45.1)	43 (55.1)	*ns*
Unemployment insurance	1 (2.0)	4 (5.1)	*ns*
Social insurance	13 (25.5)	26 (33.3)	*ns*
Disability insurance	17 (33.3)	10 (12.8)	.005
Help from relatives	10 (19.6)	8 (10.3)	*ns*
Satisfaction with income			*ns*
Satisfied	10 (19.6)	21 (26.9)	
Just enough to live with	18 (35.3)	21 (26.9)	
Not enough to live with	23 (45.1)	36 (46.2)	

Note: T-tests are performed for continuous variables (i.e., age at T_2) and χ^2 for categorical variables.

Table 2. Differences in clinical data at T_1 and T_2 according to gender.

	Women ($n = 54$)	Men ($n = 80$)	Time effect	Gender effect	Time x Gender
Strain at T_1	2.7 (1.6)	2.2 (1.4)	.004	.036	*ns*
Strain at T_2	2.1 (1.3)	2.1 (1.6)			
Anxiety/depression at T_1	4.7 (2.7)	2.4 (2.0)	.107	<.001	.011
Anxiety/depression at T_2	3.7 (2.6)	2.5 (2.0)			
Anger/irritability at T_1	5.5 (2.4)	4.5 (2.7)	<.001	.004	*ns*
Anger/irritability at T_2	3.8 (2.9)	3.3 (2.7)			
Delinquency at T_1	65.6 (10.1)	62.2 (9.9)	<.001	.032	*ns*
Delinquency at T_2	56.3 (7.2)	55.2 (6.7)			

and anger/irritability (moderating term) at T_1 for each gender. The regression model explained a significant part of the variances only in men ($F(6,63) = 2.60$; $p = .026$, $R^2 = .199$), a higher level of delinquent behaviors at T_1, and a lower level of anxiety/depression at T_1 significantly predicted a higher level of delinquent behaviors at T_2 (Table 3).

A second regression model was computed to model the changes (between T_1 and T_2) in delinquency by change in strain, anger/irritability, and anxiety/depression, and the interaction between these two last variables over time. The regression models were significant neither in men nor in women (Table 3).

Table 3. Regression analyses.

			Women		Men	
Model	Criterion	Predictors	β	*p*	β	*p*
1	Delinquency at T_2	Age	0.094	0.563	−0.080	0.495
		Delinquency at T_1	*0.438*	*0.021*	**0.256**	**0.031**
		Strain at T_1	−0.187	0.344	0.011	0.929
		Anxiety/depression at T_1	0.196	0.412	**−0.352**	**0.050**
		Anger/irritability at T_1	−0.006	0.977	0.276	0.135
		Anger x anxiety at T_1	−0.167	0.413	−0.174	0.187
2	Change in delinquency	Age	0.106	0.506	−0.091	0.470
		Delta strain	0.163	0.374	−0.121	0.383
		Delta anxiety/depression	0.034	0.879	0.252	0.123
		Delta anger/irritability	0.200	0.324	−0.041	0.803
		Delta anger x delta anxiety	0.047	0.780	0.007	0.957

Note: Significant values in significant models are in bold. Significant values in non-significant or marginally significant models are in italics.

Discussion

The objectives of the present study were to test the predictions of the gendered GST in a 10-year follow-up time in an at-risk sample. First, we tested gender differences over time in strain, negative emotions, and delinquency. Results revealed higher scores for women in strain, anxiety/depression, anger/irritability, and delinquency at both timepoints. Moreover, we observed a reduction in anxiety/depression over time but only in women. Second, the moderation analyses only partially support the gendered GST over time. Indeed, we observed that only in men, higher delinquency and lower anxiety/depression at T_1 were related to higher delinquency at T_2. The changes over time in strain and negative emotions did not predict the changes in delinquency. In women, the gendered GST over time is not supported by our results.

Gender differences over time

As mentioned in the literature, there is a natural desistance from delinquent activities over time (see for instance Villeneuve, Dufour, and Turcotte 2019; Weaver 2019), with women and men showing less delinquent behaviors when they reach adulthood compared to adolescence.

Furthermore, a general reduction in anger/irritability and strain was reported in men as well as in women, suggesting a certain appeasement in emotions (or better ability to cope with emotions or stress) in adulthood compared to adolescence and from living in institution to autonomous living conditions. Such reduction in emotion is well known in developmental literature and has been related to cerebral maturation allowing a better control and integration of different brain structure functioning when processing emotional stimuli (see for instance Vink et al. 2014; Yurgelun-Todd 2007). This maturation results in a general lower emotional activation coupled with better and more adequate regulation strategies. Finally, women in our sample also showed a generally significant reduction in anxiety/depression with time, which was not found in men, although women still were higher in these symptoms than men at T_1 and T_2.

Testing gendered GST over time

Referring to the gendered GST, we note that dispositions predicting delinquent behaviors in our sample at adolescence (i.e., strain and anger/irritability in boys and strain, anger/irritability, and depression/anxiety in girls; see Habersaat et al. 2020), for the most part, did not predict delinquent behaviors 10 years later. Especially, strain and anger, which are central predictors in the GST, and were clearly related to delinquent behaviors in boys and girls at

adolescence in our sample (Habersaat et al. 2020), are not related to delinquent behaviors 10 years later, suggesting that these factors may be more situational than "traits" or chronic factors. This is reinforced by the fact that even changes in anger over time (increase or decrease) have no influence on delinquent behaviors. The debate concerning the state versus trait nature of factors associated with delinquency has already been going on for a long time between partisans of the GST, both state and traits having been differently associated with delinquent behaviors (see for instance Gao, Wong, and Yu 2016; Jang and Rhodes 2012; Manasse, João Lobo Antunes, and Ganem 2020). However, most of these studies tested the GST in cross-sectional samples or using a relatively short follow-up period (i.e., 1 or 2 years). Our 10-year span, encompassing the transition from adolescence to adulthood, and from institution to autonomous living, is so large and full of biological and environmental changes, and the factors predicting behaviors at one time point were, for the most part, not related to behaviors at the second time point. This seems especially true for women, where all models were non-significant. Indeed, in women, it appears that none of the emotional variables proposed by the previous studies, and included in this one, predicted delinquent behaviors at adulthood. Reasons for offending in women of our sample must thus be found elsewhere, maybe in a timelier proximate assessment of emotional levels and delinquent behaviors, psychosocial factors such as unemployment, troubles with a partner, substance use, or more serious mental illness, but were not predicted by emotional functioning 10 years before. Theories of desistance from delinquent behavior from adolescence to young adulthood may provide further insight into the factors that may intervene in this process. Indeed, these theories suggest that numerous internal, external, and social changes occur by the time an individual reaches adulthood that may collectively promote desistance (Cauffman and Steinberg 2000; see for instance Sampson and Laub 1995; Steinberg and Cauffman 1996). Such changes include, among others, psychosocial maturation (Rocque, Beckley, and Piquero 2019) or involvement in typically adult life events (military, marriage, and employment, Sampson and Laub 1995) and represent a form of engagement with conventional adults' responsibilities that allow for the formation of new positive social bonds and desistance from delinquent activities. While these changes may involve more effective emotion regulation, emotions are clearly not a sufficient factor to explain the persistence of delinquency between adolescence and adulthood. The gendered GST is therefore unlikely to be sufficient to explain differences in delinquent behavior between women and men over the long term.

In the present results, strain at adolescence did not predict delinquent behaviors 10 years later. By contrast, a longitudinal study by Eitle (2010) showed that a reduction in strain with time resulted in a reduction in delinquent activities in male students. In our study, strain was measured using a very general instrument assessing exposures to traumatic situations, including having been a victim of a sexual aggression and a violent aggression, having been a witness of a violent aggression/accident resulting in other's serious injury or death, and experiencing trauma-related reminiscence and nightmares (Grisso and Barnum 2000). This instrument therefore does not allow exploring strain related to psychological factors such as harassment, feeling of abandonment and isolation, neglect, or complex relationships with mentally ill parents that may be experienced by adolescents sent to institution. However, in the first study with this sample at adolescence, strain was a strong predictor of delinquent behaviors in boys and girls (Habersaat et al. 2020). Moreover, the strain score did not significantly change over time, which may suggest that individuals in our sample learned to deal with their past trauma experience with time in a way that it does not affect their delinquent behaviors anymore.

In men's models, higher anxiety/depressive symptoms at adolescence predicted lower delinquent behaviors. These results suggest a protective effect of anxiety/depression in men, as it was commonly found in women in the framework of the gender GST and to some extent in a community sample of adolescent men (Posick, Farrell, and Swatt 2013). This contrasts with other studies suggesting that depressive symptoms were related to higher delinquent behaviors in boys (De Coster and Zito 2010; Kim et al. 2021). These inconsistencies between studies regarding

the risk versus protective aspect of anxiety/depressive symptoms in men toward delinquent behaviors may be due to differences across studies in terms of methodology and sample characteristics. Culture and social traditions, also playing a role in gender emotional display and gender identity, may also explain these differences in findings.

Limitations

The findings of this study should be understood in the light of some limitations. Indeed, boys and girls of the initial sample recruited at adolescence in institution were not fully comparable. Indeed, while there were fewer girls than boys in juvenile justice and youth welfare institution, they reported more delinquent behaviors. This is a possible justice-related gender bias, judges tending to remove less easily girls from their family, and only when they showed extremely inadequate behaviors, or a selection bias, girls with more problems feeling more concerned by the study and wanting to communicate about their life to people outside the institution. Furthermore, women who participated in the follow-up study reported more anger/irritability and more anxiety/depression at adolescence than girls who dropped out, suggesting that women with more problems were more invested in the study and maybe needed to share their experiences. These differences between participants included in the follow-up, and those who dropped out were not found in men. Finally, women included in the follow-up differed from men in terms of parenthood, 30% of women versus 15% of men having children, and in terms of financial support, significantly more women receiving help from their family and from a disability insurance than men. All these differences may have limited the comparability of the sample and its generalization to other samples of individuals who grew up in institutions.

Another limitation is the exclusive use of self-reported measures. Indeed, it is possible that for various gender-related social or functional reasons, women and men are not similar in their capacity for self-reflection, insights and emotional access, identification, and report. Indeed, gender display rules may refrain men to show and report negative emotions, which may have impacted their responses to questionnaires (see Bauer, Stennes, and Haight 2003; Roberts and Pennebaker 1995). It is also important to emphasize that the instrument used to measure symptoms of depression also included symptoms of anxiety as the two often co-occur. However, strategies for coping with anxiety and with depression symptoms and their relationship to delinquent behavior may differ. This may have influenced our results, especially since Agnew and Broidy's theory focused primarily on depression symptoms. Furthermore, the instrument used to measure strain is a relatively short list of major potentially traumatic events that can occur in life such as being victim of a severe or sexual aggression, or being a witness of such events, and thus does not fully capture the extent nor the variety of stressors individuals who grow up in institution are confronted to.

Finally, as already mentioned earlier, 10 years is a long period to measure factors predicting delinquency as labile as emotions at adolescence. Indeed, the transition to adulthood is a tumultuous time where everything changes, the individual having more agency to make changes in his/her life. Therefore, the emotional dynamic and the challenges at adolescence (gaining independence and affirming his/her identity) are not the same as those at adulthood (being responsible of oneself), making these two periods of life very different from one another. It is then possible that strain-generated negative emotions affecting the adolescent behaviors are no longer the same as those affecting adult behaviors. It is also likely that adults resent and cope with negative emotions differently than adolescents so that the relationship between strain and emotion in adolescence is not predictive of later delinquent behavior. Furthermore, as noted above, while we have taken the side of considering emotion regulation problems (such as showing high levels of anger) as a trait, and therefore not very modifiable by time, other authors have suggested that "state" dysregulated emotions are more predictive of delinquent behaviors. If the latter assumption is true, the time period between the display of the emotion and the delinquent behavior is shorter and would not fit our study design.

Conclusions

The present study tested the gendered GST over a 10-year period, in predicting delinquent behaviors in women and men who grew up in child welfare and juvenile justice institutions. Results showed a general reduction in emotions and delinquent behaviors over the years in women and in men. Furthermore, the gendered GST is partially supported in men where we observed that more anxiety/depressive symptoms were related to lower delinquency over 10 years, suggesting a protective effect of anxiety/depression on delinquent behaviors in men. By contrast, in women, the gendered GST seems not to have any validity over time.

Acknowledgments

We would like to thank the 64 Youth Welfare and Juvenile Justice Institutions and especially the young adults that offered their time for the assessments.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

The work was supported by the Swiss Ministry of Justice.

Notes on contributors

Stéphanie Habersaat is a psychologist–criminologist and has Ph.D. in Life Sciences. She was appointed as a research psychologist at the Child and Adolescent Psychiatric Research Department, Psychiatric University Hospitals Basel, and as a criminologist at the Penal Enforcement Service in the State of Valais, Switzerland. Her main research interests focus on exposure to traumatic situations, stress, biological regulation, and criminal behavior.

Sébastien Urben, Ph.D., is a research psychologist leading the clinical research group of the Division of Child and Adolescent Psychiatry, University Hospital of Lausanne. His primary research interests are related to the role of self-regulatory control processes in the apparition and maintenance of developmental psychopathology.

Julie Palix, Ph.D., is a psychologist and works as a senior researcher at the Institute of Forensic Psychiatry of the University Hospital of Lausanne. Her main research interests focus on biological and psychological variables associated with criminal behaviors.

David Bürgin, Ph.D., is a research psychologist who is currently working as a postdoctoral researcher at the Child and Adolescent Psychiatric Research Department, Psychiatric University Hospitals Basel (UPK), and the Department of Child and Adolescent Psychiatry and Psychotherapy, University Hospital of Ulm. He mainly investigates the long-term sequelae of early life stress in high-risk and population-based samples.

Jörg M. Fegert is a child and adolescent psychiatrist and psychotherapist, as well as a specialist for adult psychosomatic and psychotherapy. He is a medical director at the Department of Child and Adolescent Psychiatry and Psychotherapy, University Hospital of Ulm in Germany. His research areas are child protection, adverse childhood experiences, children in foster and institutional care, and ethical as well as methodological questions concerning interventions for children and adolescents. He is the president of the Scientific Council of Family Affairs of the German government.

Klaus Schmeck is a child and adolescent psychiatrist, psychologist, and psychotherapist. He is the former chair of child and adolescent psychiatry at the University of Basel, Switzerland. His research interests are personality disorders in adolescence, development of psychometric instruments, autism spectrum disorders, and adolescent forensic psychiatry. He is the member of the board of EFCAP (European Forensic Child and Adolescent Psychiatry).

Cyril Boonmann, Ph.D., is appointed as a senior research psychologist at the Child and Adolescent Psychiatric Research Department and the Department of Forensic Child and Adolescent Psychiatry of the University of Basel Psychiatric Hospital, as well as the Faculty of Psychology of the University of Basel. He is the project coordinator of JAEL, the long-term follow-up study of MAZ.

Marc Schmid, Ph.D., is a senior research psychologist at the Department of Child and Adolescent Psychiatry of the University of Basel Psychiatric Hospital. He is a lecturer and head of a research group at the University of Basel. His research focuses on the interplay between youth welfare and child and adolescent psychiatry/psychotherapy, (complex) trauma and trauma therapy, self-injurious behavior, multi-systemic therapy, and personality disorders in adolescence.

References

Achenbach, T. M. 1991. *Manual for the Youth Self-Report and 1991 Profiles*. Burlington: University of Vermont.

Achenbach, T. M. and C. S. Edelbrock. 1987. *Manual for the Youth Self-Report and Profile*. Burlington, VT: University of Vermont. Department of Psychiatry.

Agnew, R. 1992. "Foundation for a General Strain Theory of Crime and Delinquency." *Criminology* 30(1):47–88. doi:10.1111/j.1745-9125.1992.tb01093.x.

Agnew, R. 2001. "Building on the Foundation of General Strain Theory: Specifying the Types of Strain Most Likely to Lead to Crime and Delinquency." *Journal of Research in Crime and Delinquency* 38(4):319–61. doi:10.1177/0022427801038004001.

Agnew, R. 2003. "An Integrated Theory of the Adolescent Peak in Offending". *Youth & Society* 34(3):263–99. doi:10.1177/0044118X02250094

Agnew, R. 2006. *Pressured into Crime: An Overview of General Strain Theory*. Los Angeles: Roxbury.

Baek, Hyunin, Amanda M Roberts, Randy Seepersad, and Kristin Swartz. 2019. "Examining Negative Emotions as Mediators Between Exposures to Family Violence and Bullying: A Gendered Perspective." *Journal of School Violence* 18(3):440–54. doi:10.1080/15388220.2018.1519441.

Bauer, Patricia, Leif Stennes, and Jennifer Haight. 2003. "Representation of the Inner Self in Autobiography: Women's and Men's Use of Internal States Language in Personal Narratives." *Memory* 11(1):27–42. doi:10.1080/741938176.

Brody, Leslie R. 1997. "Gender and Emotion: Beyond Stereotypes." *Journal of Social Issues* 53(2):369–93. doi:10.1111/j.1540-4560.1997.tb02448.x.

Broidy, L. and R. Agnew. 1997. "Gender and Crime: A General Strain Theory Perspective." *Journal of Research in Crime and Delinquency* 34(3):276–307. doi:10.1177/0022427897034003001.

Cauffman, Elizabeth and Laurence Steinberg. 2000. "(Im) Maturity of Judgment in Adolescence: Why Adolescents May Be Less Culpable Than Adults." *Behavioral Sciences & the Law* 18(6):741–60. doi:10.1002/bsl.416.

De Coster, Stacy and Rena C Zito. 2010. "Gender and General Strain Theory: The Gendering of Emotional Experiences and Expressions." *Journal of Contemporary Criminal Justice* 26:224–45. doi:10.1177/1043986209359853.

Dolliver, Matthew J and Dixie L Rocker. 2018. "Addressing a Divide in the Conceptualization of the Gender-Crime Relationship: A Comparative Test of Gender and Sex Using General Strain Theory." *Deviant Behavior* 39 (12):1552–65. doi:10.1080/01639625.2017.1410619.

Eitle, David. 2010. "General Strain Theory, Persistence, and Desistance Among Young Adult Males." *Journal of Criminal Justice* 38(6):1113–21. doi:10.1016/j.jcrimjus.2010.08.003.

Gao, Yunjiao, Dennis SW Wong, and Yanping Yu. 2016. "Maltreatment and Delinquency in China: Examining and Extending the Intervening Process of General Strain Theory." *International Journal of Offender Therapy and Comparative Criminology* 60(1):38–61. doi:10.1177/0306624X14547495.

Glassner, Steven D and Sujung Cho. 2018. "Bullying Victimization, Negative Emotions, and Substance Use: Utilizing General Strain Theory to Examine the Undesirable Outcomes of Childhood Bullying Victimization in Adolescence and Young Adulthood." *Journal of Youth Studies* 21(9):1232–49. doi:10.1080/13676261.2018.1461200.

Grisso, Thomas and Richard Barnum. 2000. *Massachusetts Youth Screening Instrument, Second Version (MAYSI-2): User's Manual and Technical Report. Worcetser, MA*: University of Massachusetts Medical School.

Habersaat, Stéphanie, Cyril Boonmann, Klaus Schmeck, Philippe Stéphan, Eric Francescotti, J. M. Fegert, Christian Perler, Marc Schmid, and Sébastien Urben. 2020. "Gender Differences in the Relationship Between Strain, Negative Emotions and Delinquent Behaviors in Institutionalized Juveniles." *Deviant Behavior* 41 (9):1113–24. doi:10.1080/01639625.2019.1596549.

Hartinger-Saunders, Robin M, Susan Snyder, St. Christopher, Barbara Rittner Vil, Thomas Nochajski, F. William, and Alex Trouteaud. 2019. "Mediators Between Victimization and Offending Among Young Men in the Context of General Strain Theory." *Journal of Evidence-Based Social Work* 16(4):386–403. doi:10.1080/26408066.2019.1614129.

Iratzoqui, Amaia. 2020. "A Gendered Model of Lifetime Experiences of Strain." *Youth & Society* 52(2):166–86. doi:10.1177/0044118X17736328.

Jang, Sung Joon. 2007. "Gender Differences in Strain, Negative Emotions, and Coping Behaviors: A General Strain Theory Approach." *Justice Quarterly* 24(3):523–53. doi:10.1080/07418820701485486.

Jang, Sung Joon and Jeremy R Rhodes. 2012. "General Strain and Non-Strain Theories: A Study of Crime in Emerging Adulthood." *Journal of Criminal Justice* 40(3):176–86. doi:10.1016/j.jcrimjus.2011.09.003.

Kaufman, Joanne M. 2009. "Gendered Responses to Serious Strain: The Argument for a General Strain Theory of Deviance." *Justice Quarterly* 26(3):410–44. doi:10.1080/07418820802427866.

Keith, Shelley, Timothy E McClure, Lauren M Vasquez, M. Jason Reed, and David C May. 2015. "How Does Gender Identity Affect the Relationship Between Strain and Negative Emotions?" *Sociological Spectrum* 35(2):179–206. doi:10.1080/02732173.2014.1000555.

Kim, Jihoon, Lindsay Leban, Yeungjeom Lee, and Wesley G Jennings. 2021. "Testing Gender Differences in Victimization and Negative Emotions from a Developmental General Strain Theory Perspective." *American Journal of Criminal Justice* 48(2):1–19. doi:10.1007/s12103-021-09650-9.

Liu, Ruth X. 2021. "Relational Strains and Delinquency: Assessing the Gendering of emotions' Claims Among Chinese Adolescents." *Sociological Inquiry* 91(1):30–59. doi:10.1111/soin.12291.

Manasse, Michelle, Maria João Lobo Antunes, and Natasha Ganem. 2020. "Using Vignettes to Assess Gendered Responses to Strain: The Role of Negative State Emotion in Predicting Male Vs. Female Intentions to Offend." *Women & Criminal Justice* 31(4):1–20. doi:10.1080/08974454.2019.1706697.

Moffitt, Terrie E, Avshalom Caspi, Michael Rutter, and Phil A Silva. 2001. *Sex Differences in Antisocial Behaviour: Conduct Disorder, Delinquency, and Violence in the Dunedin Longitudinal Study*. Cambridge university press.

Moon, Byongook and Merry Morash. 2017. "Gender and General Strain Theory: A Comparison of Strains, Mediating, and Moderating Effects Explaining Three Types of Delinquency." *Youth & Society* 49(4):484–504. doi:10.1177/0044118X14541877.

Office fédéral de la statistique. 2015. *Statistique des condamnations pénales 1984-2014. Récidive sur le long terme des Suisses nés la même année. edited by Section criminalité et droit pénal*. Neuchâtel: Office fédéral de la statistique.

Office fédéral de la statistique. 2020. *Statistique policière de la criminalité (SPC). Rapport annuel 2019 des infractions enregistrées par la police. edited by Section criminalité et droit pénal*. Neuchâtel: Office fédéral de la statistique.

Piquero, Nicole L and Miriam D Sealock. 2004. "Gender and General Strain Theory: A Preliminary Test of Broidy and Agnew's Gender/GST Hypotheses." *Justice Quarterly* 21(1):125–58. doi:10.1080/07418820400095761.

Posick, Chad, Amy Farrell, and Marc L Swatt. 2013. "Do Boys Fight and Girls Cut? A General Strain Theory Approach to Gender and Deviance." *Deviant Behavior* 34(9):685–705. doi:10.1080/01639625.2012.748626.

Roberts, Tomi-Ann and James W Pennebaker. 1995. "Gender Differences in Perceiving Internal State: Toward a His-And-Hers Model of Perceptual Cue Use." pp. 143–75 in *Advances in Experimental Social Psychology Volume 27*, Elsevier. doi:10.1016/S0065-2601(08)60405-0.

Rocque, Michael, Amber L Beckley, and Alex R Piquero. 2019. "Psychosocial Maturation, Race, and Desistance from Crime." *Journal of Youth and Adolescence* 48(7):1403–17. doi:10.1007/s10964-019-01029-8.

Sampson, Robert J and John H Laub. 1995. *Crime in the Making: Pathways and Turning Points Through Life*. Cambrige, MA: Harvard University Press.

Schmid, Marc, Michael Kölch, Joerg M Fegert, Klaus Schmeck, and M. A. Z. Team. 2013. "Abschlussbericht Modellversuch Abklärung und Zielerreichung in stationären Massnahmen." *Bern, Bundesamt für Justiz*. https://www.bj.admin.ch/dam/data/bj/sicherheit/smv/modellversuche/evaluationsberichte/maz-schlussbericht-d.pdf.

Scott, Isom, A. Deena, and Toniqua Mikell. 2019. "'Gender'and General Strain Theory: Investigating the Impact of Gender Socialization on Young Women's Criminal Outcomes." *Journal of Crime & Justice* 42(4):393–413. doi:10.1080/0735648X.2018.1559754.

Sigfusdottir, Inga-Dora, George Farkas, and Eric Silver. 2004. "The Role of Depressed Mood and Anger in the Relationship Between Family Conflict and Delinquent Behavior." *Journal of Youth & Adolescence* 33(6):509–22. doi:10.1023/B:JOYO.0000048065.17118.63.

Steinberg, Laurence and Elizabeth Cauffman. 1996. "Maturity of Judgment in Adolescence: Psychosocial Factors in Adolescent Decision Making." *Law and Human Behavior* 20(3):249–72. doi:10.1007/BF01499023.

Villeneuve, M.-P., I. Dufour, and D. Turcotte. 2019. "The Transition Towards Desistance from Crime Among Serious Juvenile Offenders: A Scoping Review." *Australian Social Work* 72(4):473–89. doi:10.1080/0312407X.2019.1586967.

Vink, Matthijs, Jolanda M Derks, Janna Marie Hoogendam, Manon Hillegers, and René S Kahn. 2014. "Functional Differences in Emotion Processing During Adolescence and Early Adulthood." *Neuroimage* 91:70–76. doi:10.1016/j.neuroimage.2014.01.035.

Watts, Stephen J and Thomas L McNulty. 2013. "Childhood Abuse and Criminal Behavior: Testing a General Strain Theory Model." *Journal of Interpersonal Violence* 28(15):3023–40. doi:10.1177/0886260513488696.

Weaver, Beth. 2019. "Understanding Desistance: A Critical Review of Theories of Desistance." *Psychology, Crime & Law* 25(6):641–58. doi:10.1080/1068316X.2018.1560444.

Yıldız, Muhammed and Özgür Solakoglu. 2019. "Strain, Negative Emotions, and Suicidal Behaviors Among Adolescents: Testing General Strain Theory." *Youth & Society* 51(5):638–58. doi:10.1177/0044118X17700318.

Yun, Minwoo, Eunyoung Kim, and Robert Morris. 2014. "Gendered Pathways to Delinquency: An Examination of General Strain Theory Among South Korean Youth." *Youth Violence and Juvenile Justice* 12(3):268–92. doi:10.1177/1541204013497769.

Yurgelun-Todd, Deborah. 2007. "Emotional and Cognitive Changes During Adolescence." *Current Opinion in Neurobiology* 17(2):251–57. doi:10.1016/j.conb.2007.03.009.