



The impact of the COVID-19 pandemic on European police officers: Stress, demands, and coping resources

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ABSTRACT

Purpose: Facing the COVID-19 pandemic, police officers are confronted with various novel challenges, which might place additional strain on officers. This mixed-method study investigated officers' strain over a three-month-period after the lockdown.

Methods: In an online survey, 2567 police officers (77% male) from Austria, Germany, Switzerland, the Netherlands, and Spain participated at three measurement points per country in spring, 2020. Three-level growth curve models assessed changes in strain and its relation to stressor appraisal, emotion regulation, and preparedness through training. To add context to the findings, free response answers about officers' main tasks, stressors, and crisis measures were coded inductively.

Results: On average, officers seemed to tolerate the pandemic with slight decreases in strain over time. Despite substantial variance between countries, 66% of the variance occurred between individuals. Sex, work experience, stressor appraisal, emotion regulation, and preparedness significantly predicted strain. Risk of infection and deficient communication emerged as main stressors. Officers' reports allowed to derive implications for governmental, organizational, and individual coping strategies during pandemics.

Conclusion: Preparing for a pandemic requires three primary paths: 1) enacting unambiguous laws and increasing public compliance through media communication, 2) being logistically prepared, and 3) improving stress regulation skills in police training.

While most critical, highly threatening police incidents, such as terrorism, only impact a limited geographic area for a short time, the COVID-19 pandemic has spread globally and has continued to be a public health emergency for an extended period of time. During pandemics, law enforcement agencies (LEAs) play a crucial role in the effort to control the spreading of the disease, maintaining public order and promoting safer communities. In order to protect the health of residents, unprecedented strict governmental measures have been enacted. In their responsibility to enforce these measures, street patrol officers are confronted with various challenges: the constant risk of infection, changing governmental measures leading to a shift in calls for services, and numerous alterations in policing protocols (Stogner, Miller, & McLean, 2020). All of those may lead to uncertain or potentially stressful situations, in which officers are still expected to decide and act appropriately. As such, it is critical to

quantify the scope of the impact of the COVID-19 pandemic on officers in order to justify and properly target resources that allow LEAs and officers to cope with the pandemic (Stogner et al., 2020). The present study investigated (1) the working demands police officers face, (2) the perceived individual, organizational, and governmental resources to meet these demands, and (3) how they interact to determine the strain of the pandemic on police officers. These insights are intended to inform, update, and improve police leaders' and policy makers' understanding of preventive training and effective crisis management in pandemics to ensure that LEAs can continue to provide community services while protecting police officers' health and well-being.

According to the Transactional Stress Theory (Lazarus & Folkman, 1984), stress results from the individual's perception of a discrepancy between the environmental demands placed on him/her

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and his/her coping resources present in a particular situation. In this cognitive appraisal process, the individual judges on the one hand the stressfulness of the environmental demands (the so-called *stressors*) and on the other hand the availability and effectiveness of coping resources to meet these demands. When the individual perceives the stressors as exceeding his/her coping resources, a negative, unpleasant psychological state of stress ensues, commonly accompanied by fatigue (Dorr et al., 2015; Strahler & Luft, 2019) and deterioration in mood (Giessing et al., 2019; Lieberman et al., 2016; Schlotz, 2019). In this sense, the central mechanism posited in the Transactional Stress Theory (Lazarus & Folkman, 1984) shows similarities to the mechanism proposed by the General Strain Theory (GST; Agnew, 1992), which explains why individuals might engage in deviant behaviour. In both accounts, adverse environmental demands (e.g., failure to achieve a goal, the removal of positive stimuli or the exposure to negative stimuli) lead to stress or strain in the absence of adequate coping strategies. Importantly, the appraisal of the stressors and coping resources is constantly updated and may change rapidly dependent on the circumstances (Lazarus & Folkman, 1984).

Besides the well-known stressors in police work (Giessing et al., 2019; Violanti et al., 2016; Violanti & Aron, 1995), the COVID-19 pandemic places a high number of novel environmental demands on police officers. Most obvious, the risk of infection with COVID-19 is an additional threat that jeopardizes officers' health and lives (Drake & Altheimer, 2020; Jennings & Perez, 2020; Milliard & Papazoglou, 2020; Stogner et al., 2020). Due to the nature of police work, officers need to be physically present in order to serve and protect communities. During their shift, they come into contact with a large number of colleagues and civilians, whose COVID-19 status is often unknown, requiring officers to be increasingly hypervigilant of their environment (Stogner et al., 2020). Moreover, critical tasks (e.g., arrests) require them to violate guidelines on social distancing, increasing the risk of infections. At the same time, police officers face new types of threatening and hazardous behaviour by assailants through intentional contamination, such as spitting attacks (Jennings & Perez, 2020). While personal protective equipment (PPE) could reduce the risk of infection, the sufficient availability of appropriate PPE – even for critical infrastructure – was uncertain at the outbreak of the pandemic (Sim, 2020; Stogner et al., 2020). Naturally, the number of infected or self-quarantined officers was predicted to increase over the course of the pandemic, which might result in staff shortage and higher workload for those left in the work force (Drake & Altheimer, 2020; Milliard & Papazoglou, 2020). As a result, and to prevent spreading within the police force, shift schedules and working hours have been adjusted (Jennings & Perez, 2020). In European countries, LEAs have transitioned their personnel to work remotely if possible, instituted a 50/50 work plan to keep two groups within each department completely separate from each other, and suspended in-service training (e.g., in Austria, Germany, and the Netherlands). Additionally, the public health measures put in place by the governments have created novel tasks and procedures that needed to be implemented by the police officers at short notice (Stogner et al., 2020). These governmental measures have also led to a shift in crime and service (e.g., “criminalizing” common behaviours such as gathering with friends; Campedelli, Aziani, & Favarin, 2003; Mohler et al., 2020). In this context, officers are more likely to experience high-stress encounters with anxious or intransigent individuals aggravated by the fear of contagion, economic uncertainty, and isolation, especially since the new policies have been challenged on political, economic, and legal grounds (Stogner et al., 2020). Therefore, the COVID-19 pandemic is hypothesized to be a significant stressor for officers compounding the general work stress associated with the occupation. While all of

these demands are described as potentially stressful in the literature (Drake & Altheimer, 2020; Jennings & Perez, 2020; Milliard & Papazoglou, 2020; Stogner et al., 2020), targeted crisis management should primarily address those that are perceived as threatening by the officers, thus taking their lived experience into account.

Despite all the potential stressors, the availability of coping resources will determine whether they result in higher stress levels than usual or not. Emotion regulation is an essential individual coping resource to be considered in this context. Adaptive emotion regulation strategies (e.g., reappraisal) have been shown to decrease negative affect and increase positive affect, while maladaptive strategies (e.g., suppression) increase negative affect and decrease positive affect (Brans, Koval, Verduyn, & Lim, 2013; Katana, Röcke, Spain, & Allemand, 2019; Richardson, 2017). In the context of emotion regulation of work stress, work experience has been found to decrease perceived stress and increase related well-being (Katana et al., 2019) and stress reactivity to police incidents (Landman, Nieuwenhuys, & Oudejans, 2016). When considering individual differences, the COVID-19 pandemic might differentially affect stress levels of men and women as there are large gender differences in police stress in general (Violanti et al., 2016) and in response to the 9/11 terrorist attack (Bowler et al., 2010), with women being more stressed. Identification of governmental, organizational and individual characteristics and behaviours linked to successful coping is needed so that the actions can be replicated by other LEAs and officers. More importantly, an understanding of vulnerable officers and lacking coping resources can assist LEAs in directing resources towards their officers in most need (Stogner et al., 2020).

Officers are expected and trained to respond to danger and crises. Therefore, police training should have equipped them with necessary coping resources to resolve crisis situations effectively (Milliard & Papazoglou, 2020). Additionally, governments and police organizations have introduced legal decrees and procedures to meet the demands of the pandemic (European Centre for Disease Prevention and Control, 2020; International Association of Chiefs of Police (IACP), 2020; Jennings & Perez, 2020). While some of these measures may be helpful, they might also have detrimental effects on officers' productivity and well-being. Constantly altered safety protocols and policies might limit officers' attention and complicate interaction with civilians (e.g., PPE may impair field of vision, breathing, and grip on objects; Stogner et al., 2020).

Since the police carries great responsibility in the effort to control the spread of COVID-19, effective management of the demands of the pandemic is crucial to protect police officers' functioning, well-being, and health. Given that stress can have tremendous consequences on performance (Nieuwenhuys & Oudejans, 2017) and health (McEwen & Stellar, 1993), one approach to safely lead police officers through the pandemic is to reduce their strain by strengthening their coping resources. So far, stressors and avenues for providing officer support have only narratively been discussed in the literature, but no empirical data has been collected (Jennings & Perez, 2020; Milliard & Papazoglou, 2020; Stogner et al., 2020). The present study aimed at filling this research gap by exploring the relationship between police officers' work stressors, coping resources, and stress during the pandemic. Police officers' perceived stress, mood, and fatigue (collectively representing the strain they experience) were repeatedly measured throughout a 11-week period during the COVID-19 pandemic to reveal how officers were coping at each specific time point. At the outbreak of COVID-19, the development of the pandemic as *stressor* as well as the effectiveness of the governmental, organizational and individual measures as *coping resources* were unclear. Therefore, we hypothesized that officers' strain would vary over the course of the pandemic (hypothesis 1). While all European countries have been impacted by COVID-19, gov-

environmental measures and their timelines to contain the spread of the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) differed among countries (European Centre for Disease Prevention and Control, 2020). Therefore, it was assumed that officers' strain varies between countries (hypothesis 2). Previous research has suggested interindividual differences in police officers' stress reactivity based on sex (Bowler et al., 2010; Violanti et al., 2016) and work experience (Landman, Nieuwenhuys, & Oudejans, 2016). Therefore, we assumed that women would report higher stress levels than men (hypothesis 3), while work experience would reduce stress responses (hypothesis 4). Building on the stress model (Lazarus & Folkman, 1984), time-variant differences in the appraisal of the stressors as well as the effectiveness of coping resources will also impact officers' strain. We assumed that negative stressor appraisal of the pandemic would increase officers' strain (hypothesis 5). Addressing the appraisal of coping resources, we hypothesized that feelings of preparedness through training would decrease strain during the pandemic (hypothesis 6). Additionally, emotion regulation as a potential coping resource has been shown to influence work stress in other contexts (Katana et al., 2019). Therefore, we assumed that maladaptive emotion regulation would increase officers' strain, whereas adaptive emotion regulation would decrease strain (hypothesis 7).

For a proper understanding of the underlying causes and mechanisms of the strain police officers experienced during the pandemic, it is essential to include context to the quantitative analyses. Insights into the lived experience of police officers throughout the unprecedented times of COVID-19 measures are indispensable to arrive at an understanding of, and recommendations for, police work in times of a pandemic. We therefore augmented our study by incorporating open-ended questions to gain a more in-depth understanding of the impact of the COVID-19 pandemic on police officers' lives. We were especially interested in exploring the following questions to derive evidence-based recommendations for effective crisis management in European LEAs:

- (1) What are officers' main tasks during the pandemic? Which work demands do police officers perceive as stressful?
- (2) Which individual, organizational and governmental coping resources do police officers perceive as effective? In which areas do they perceive a lack of coping resources?

1. Method

The observational study was conducted in six LEAs in five European countries (Austria, Germany, Switzerland, the Netherlands and Spain/region Euskadi) during the COVID-19 pandemic from March 27, 2020 to June 5, 2020. LEAs were recruited through a consortium and its networks of an EU Horizon 2020 project that includes multiple European LEAs and investigates the feasibility of virtual reality in police training (i.e., SHOTPROS, <https://shotpros.eu>). To examine a large, diverse sample of officers, the participating LEAs widely distributed the survey online through mailing lists using SoSci Survey (www.sosicisurvey.de). In a longitudinal approach, each LEA participated at three measurement waves with a survey period of one week and two weeks between the survey periods. Due to internal approval procedures, LEAs started the online survey at different measurement points. A detailed timeline of all participating countries can be found in Table 1.

1.1. Participants

Overall, 2567 police officers (77% male) participated in at least one measurement point of the online survey. Participants were be-

Table 1
Study timeline and date of lockdown in each country.

	Lockdown	t ₁ 27 March to 02 April 2020	t ₂ 17 April to 23 April 2020	t ₃ 08 May to 14 May 2020	t ₄ 29 May to 05 June 2020
Austria	16 March 2020	Day 11 to 17	Day 32 to 38	Day 53 to 59	
Germany	23 March 2020	Day 4 to 10	Day 25 to 31	Day 46 to 52	
Switzerland	14 March 2020		Day 34 to 40	Day 55 to 61	Day 75 to 81
Netherlands	12 March 2020		Day 36 to 42		
Spain	13 March 2020		Day 35 to 41	Day 56 to 62	Day 76 to 82

tween 19 and 65 years old ($M = 39.69$, $SD = 11.64$) and reported a range of 0 to 46 years of working experience ($M = 17.22$, $SD = 12.69$). The Austrian sample included 1415 participating officers from four different regions (Vienna, Graz, Tirol and Carinthia). The German sample comprised of two LEAs (Police Berlin; Police Baden Wurttemberg, Mannheim) with 711 participating officers. In Switzerland ($n = 325$), one police department (Stadtpolizei Zurich) participated. In the Netherlands ($n = 76$) and in Spain ($n = 40$), the National Police and the Policía Autónoma de Euskid participated, respectively. Demographics of the sample in each country can be found in Table 2.

The Social and Societal Ethics Committee of the KU Leuven provided ethical approval for this study (approval number: G-2019 081712). Informed consent was obtained from the participating officers. Participants received no financial compensation.

1.2. Measures

To ensure high participation rates and to keep interference with official duties minimal, the survey was kept as short as possible. Therefore, questionnaires originally developed for ecological momentary assessment and a few self-drafted quantitative single items were used. Acknowledging the explorative nature of the study, several open, free response questions allowed participants to share the full range of their current experiences. All measures were translated into the respective language of each country. The completion of the questionnaire took on average 10–12 min.

1.2.1. Quantitative measures

Perceived stress was measured using the single item „During the last week, I felt stressed out“, rated with a Likert scale ranging from 1 (*not at all*) to 7 (*very*).

Fatigue was measured using the single item „During the last week, I felt fatigued“, rated with a Likert scale ranging from 1 (*not at all*) to 7 (*very*).

Participants' *mood* was measured by a six-item short version of the German Multidimensional Mood Questionnaire (Wilhelm & Schoebi, 2007). The items represent three bipolar scales of *valence*, *energy*, and *calmness* [unwell–well (V+), content–discontent (V–), tired–awake (E+), full of energy–without energy (E–), agitated–calm (C+), relaxed–tense (C–)]. Structural validity, sensitivity to change and reliability has been reported for this short scale (Wilhelm & Schoebi, 2007).

Stressor appraisal of COVID-19 was measured by four self-drafted items. Participants were asked to what extent they perceived the COVID-19 crisis as *stressful*, *challenging*, *controllable*, and *threatening*

Table 2
Sample description.

	Austria (n = 1415)	Germany (n = 711)	Switzerland (n = 325)	Netherlands (n = 76)	Spain (n = 40)	Total (n = 2567)
Age	38.05 (11.79)	42.20 (11.81)	39.80 (9.95)	44.13 (9.86)	44.38 (8.17)	39.69 (11.64)
Sex (m)	78%	72%	80%	74%	88%	77%
Working experience (in years)	15.34 (12.88)	21.63 (12.76)	14.63 (9.61)	20.40 (10.31)	18.44 (9.08)	17.22 (12.69)
Job Position						
Field Service	70%	37%	69%	46%	68%	60%
Patrolling Service	66%	34%	68%		65%	55%
Highway Patrol	1%	2%	2%		0%	1%
Border Control	3%	0%	0%		0%	2%
Police Cadet	1%	1%	0%		0%	1%
Office Service	22%	56%	26%	7%	4%	31%
Command Staff	15%	21%	11%		8%	15%
Criminal Investigator	5%	19%	3%		3%	8%
Case Processing	2%	15%	7%		3%	6%
Instructor	0%	2%	1%		3%	1%

Note. Job position was assessed by a free response question. Answers were categorized in the main categories Field Service and Office Service with respective categories.

on a scale from 1 (*not at all*) to 7 (*very*). A total average score was calculated with one item being reverse coded (i.e., *controllable*). The internal consistency was acceptable for all four measurement points ($\alpha > 0.71$).

The use of *emotion regulation strategies* was assessed by six items, each representing one emotion regulation strategy (Brans et al., 2013): „I have calmly reflected on my feelings“ (*reflection*), „I have changed the way I think about what causes my feelings“ (*reappraisal*), „I couldn't stop thinking about my feelings“ (*rumination*), „I have talked about my feelings with others“ (*social sharing*), „I have avoided expressing my emotions“ (*expressive suppression*), and „I have engaged in activities to distract myself from my feelings“ (*distraction*). Each item was rated on a seven-point scale ranging from 1 (*not at all*) to 7 (*very*). Following the results of Brans et al. (2013), two subscales of adaptive emotion regulation and maladaptive regulation were calculated by averaging the respective items: Adaptive emotion regulation comprised *reflection*, *reappraisal*, *distraction* and *social sharing* as they were related to increases in positive affect, while maladaptive emotion regulation consisted of *rumination* and *expressive suppression* related to increases in negative affect (Brans et al., 2013).

Preparedness through police training was measured using the single item „How well did your police training prepare you for the current work demands during the COVID-19 crisis?“ rated from 1 (*not at all*) to 7 (*very*).

1.2.2. Qualitative measures

The purpose of the open, free response questions was to explore officers' lived experiences and practices at various stages during the COVID-19 pandemic. In light of the main tasks during the pandemic, the survey sought to identify private and work-related stressors, effective measures taken before and during the pandemic, and availability of support. An overview of all open questions can be found in Supplement Table S1.

1.3. Statistical analysis

To verify a summary index of *strain*, a principal component analysis (PCA) was conducted on eight items of stress, fatigue, and the Multidimensional Mood Questionnaire. The aim was to obtain a parsimonious solution by explaining the variation in the original data set using only one underlying component. Reliability tests of Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy and communality values justified the use of PCA.

A multilevel growth curve approach was applied to analyze changes in strain over time during the pandemic. Multilevel modeling analyses were performed in R (R Core Team, 2020) using the lme4 package (Bates, Mächler, Bolker, & Walker, 2015) and lmerTest package (Kuznetsova, Brockhoff, & Christensen, 2017). A multilevel model assuming three levels was applied with strain (Level 1) nested within individuals (Level 2) nested within countries (Level 3). Random intercept models with fixed effects of Level 1 and Level 2 predictors on strain were specified. In Step 1, an unconditional means model with no predictor variables was built to understand the amount of variance in strain partitioned into within-person, between-person and between-countries variance. In Step 2, an unconditional growth model with time as a predictor variable was used to understand the extent to which within-person variation was a function of the passing of weeks since the lockdown (growth). Weeks since lockdown was a decimal number, which was calculated by dividing days since lockdown by 7. A quadratic trend was checked for by entering (weeks since lockdown)². In Step 3, fixed Level 1 effects of stressor appraisal, emotion regulation and preparedness (time-variant predictors) were added. In Step 4, the fixed Level 2 effects of work experience and sex (time-invariant predictors) were entered. For each Level 1 and Level 2 predictor, the interaction with the time predictor was checked and only remained in the model if significant. Prior to analyses, stressor appraisal and emotion regulation were centered around the within-person mean, thereby yielding within-subject predictors that vary within, but not between individuals (Curran & Bauer, 2011). Preparedness was centered around the within-country mean. Working experience was grand-mean centered. Models were estimated with Restricted Maximum Likelihood (REML). To compare model fit between nested models, we used Likelihood Ratio tests after refitting the respective models with Maximum Likelihood (ML). For un-nested models, the Deviance (–2LL) statistic, Akaike information criterion (AIC), and Bayesian information criterion (BIC) were used to evaluate improvements in fit with each addition of variables to the model; decreasing values indicate improvements in fit. The significance level was set at $\alpha = .05$. Pseudo-R² at Level 1 was determined using the following equation: $\text{Pseudo-R}^2 = \frac{\sigma^2_{\text{reference model}} - \sigma^2_{\text{final model}}}{\sigma^2_{\text{reference model}}}$, where the reference model is the unconditional means model (Raudenbush & Bryk, 2002).

The open-ended questions were analyzed and coded based on the deductive category assignment in the qualitative content analysis according to Mayring (2014). For analyses, data units were derived from the answers of the respondents to the open-ended questions.

Each data unit consists of an independently interpretable and meaningful unit. In some cases, the answer represented one data unit, whereas in other cases, the answers were split into multiple data units. This was done when an answer contained more than one meaningful unit and addressed more than one issue. As an example, when a respondent listed three work demands, this answer was split into three data units, each listing one work demand. The open, inductive coding was done with about 50% of the dataset, and with this selection of the data, no new codes came up. The developed coding structure was then deductively applied to the remainder of the data.

All data units were assigned to main categories, and most data units were assigned to subcategories within the main categories. If an answer could not be clearly assigned to any of the defined subcategories, it was sorted into a main category. An overview of all main categories and subcategories can be found in Supplement Table S1. Frequency of citations for each main category are reported for each measurement point and each country.

2. Results

2.1. Principal component analysis/summary index

A PCA was conducted on eight items (stress, fatigue, mood) without rotation. The KMO measure verified the sampling adequacy for the analysis, $KMO = 0.92$ (“marvellous” according to Kaiser & Rice, 1974), and all KMO values for individual items were greater than 0.90, which is well above the acceptable limit of 0.50 (Kaiser & Rice, 1974). A one-factor solution with an eigenvalue above Kaiser’s criterion of 1 (eigenvalue = 5.41) emerged and explained 68% of the variance. The items tired–awake (E+), agitated–calm (C+) and, unwell–well (V+) negatively loaded on strain (< 0.80).

Factor loadings for stress, fatigue, content–discontent (V–), full of energy–without energy (E–), and relaxed–tense (C–) were above 0.78. Varimax rotation did not change the results.

The PCA verifies the use of a single summary index representing stress, fatigue and mood. Strain was calculated as the average score of all eight items, after items with negative loadings were reverse coded. In the subsequent analyses, strain was entered as the outcome variable in the multilevel growth curve models.

2.2. Multilevel growth curve models

In total, there were 3455 completed questionnaires. Participants completed an average of 1.35 ($SD = 0.65$) questionnaires. While 248 participants completed questionnaires at all three measurement waves, 392 participants filled out two and 1927 filled out one questionnaire. Descriptive statistics of strain and all predictor variables are presented in Supplement Table S2.

Table 3 summarizes the multilevel modeling results for strain. As evidenced by the decrease in Deviance, AIC, and BIC, each model improved in fit with each subsequent step. In the Unconditional Means Model, we partitioned the between-country, between- and within-person variation in strain (see Table 3). The intraclass correlation was 0.70 – in other words, 30% of the variation in strain occurred within each individual, 62% between individuals and 8% between countries. Model comparison showed that the three-level-model had a better fit than the two-level-model ($\chi^2(1) = 110.96, p < .001$), indicating that levels of strain do vary between countries.

We examined the growth of strain as a linear and quadratic function of weeks since lockdown. Results indicated that across all partic-

Table 3
Results of the hierarchical linear model predicting strain using restricted maximum likelihood.

	Unconditional means model	Unconditional growth model	Level 1 predictors	Level 2 predictors
Fixed Effects – Estimates				
Intercept	3.51 (0.18)***	3.73 (0.17)***	3.63 (0.17)***	3.56 (0.16)***
Weeks Since Lockdown		–0.04 (0.01)***	–0.02 (0.01)**	–0.02 (0.01)**
Stressor Appraisal			0.45 (0.06)***	0.46(0.06)***
Emotion Regulation adaptive			–0.07 (0.04)	–0.09 (0.04)*
Emotion Regulation maladaptive			0.15 (0.03)***	0.16 (0.03)***
Preparedness			–0.10 (0.01)***	–0.10 (0.01)***
Sex (female)				0.22 (0.06)***
Working Experience				0.01 (0.00)**
Random Effects				
Variance Residual	0.57	0.56	0.51	0.50
Variance Individual (Intercept)	1.18	1.19	1.19	1.18
Variance Country (Intercept)	0.15	0.12	0.13	0.11
ICC, Level 3	0.08	0.06	0.07	0.06
ICC, Level 2	0.62	0.64	0.65	0.66
ICC, Level 2 nested within Level 3	0.70	0.69	0.72	0.72
Fit Statistics				
Number of Observations	3455	3455	3421	3077
Number of Individuals	2567	2567	2542	2261
Number of Countries	5	5	5	5
Deviance	11,184.4	11,157.3	10,899.5	9730.2
AIC	11,192.4	11,167.3	10,917.5	9752.2
BIC	11,216.9	11,198.1	10,972.7	9818.5
-2LL	–5592.2	–5578.7	–5449.7	–4865.1
Pseudo R ²		0.02	0.11	0.12

Note. ICC = Intraclass Correlation. Standard errors in parentheses. For all variables, higher values imply a higher level of the respective construct (a positive association implies an increase in strain with increasing parameters). Stressor appraisal and emotion regulation were person-mean centered, preparedness was group-mean centered within the respective country, and working experience was grand-mean centered.

*** $p < .001$.

** $p < .01$.

ipants, weeks since lockdown significantly predicted strain (see Table 3). A quadratic term of time did not significantly predict strain (Estimate = -0.001, SE = 0.002, p = .63) and did not improve the model fit, $X^2(1) = 0.23, p = .64$. Thus, there was a slight, but significant linear decrease of strain over time.

Next, we tested whether stressor appraisal, adaptive and maladaptive emotion regulation and preparedness predicted strain in police officers. Stressor appraisal and maladaptive emotion regulation were positively associated with strain, whereas preparedness negatively predicted strain (see Table 3). Adaptive emotion regulation did not significantly predict strain. As indicated by the decrease in Deviance, AIC, and BIC, the model improved in fit compared to the Unconditional Growth Model.

In the final model, we added the Level 2 predictors sex and work experience. Sex was significantly associated with strain, with women being more strained (see Table 3). Work experience was negatively associated with strain (see Table 3). As indicated by the decrease in Deviance, AIC, and BIC, the entering of the Level 2 predictors further improved the fit of the model.

2.3. Qualitative results

Frequency of citations for each main category are reported for each measurement point in Table 4 and for each country in the Supplement Table S3. For each question, we will discuss two to three main themes that stood out from the data by high frequencies, changes, or differences between countries. In the following sections, these themes and their content are illustrated with citations from the present survey. Supplementary quotations can be found in the Supplement Table S4.

2.3.1. Private stressors

Most of the officers (roughly 80%) did not report any private stressors, indicating that they either did not face any private stressors or that they did not want to report them in a survey conducted in an occupational setting. Among those that have reported private stressors, the two main themes of “worries about relatives” and “caregiving duties” emerged and were mentioned throughout the complete survey period (see Table 4).

Related to worries about relatives, officers mostly mentioned relatives' or friends' diseases or medical histories that might constitute them as risk patients. Some officers reported to have been faced with the death of a relative or friend.

Caregiving duties mainly consisted of childcare including home schooling. Some officers also mentioned this as a work stressor indicating that caregiving duties interfered with their working hours. It is striking that this stressor is mostly apparent in the German and Austrian sample and less so in the other countries (see Supplement Table S3). Therefore, the decrease of caregiving duties should not be interpreted as a time effect, but rather reflects differences among countries.

2.3.2. Main tasks

Officers' tasks during the COVID-19 pandemic mainly included regular police tasks and the so-called “corona patrol”.

Regular police tasks are considered as “normal everyday business” (male German officer, 53 years, t₃) including corona-unrelated patrols, vehicle controls, property protection and call for services in cases such as theft, domestic violence, disturbances or physical assault. Occasionally, officers observed an increase in cases of domestic violence.

Tasks of the corona patrol mainly aimed at being visible in the community, such as monitoring compliance with social distancing regulations, and patrolling critical infrastructure. Only a few tar-

Table 4

Frequencies of perceived private stressors, main tasks, work stressors, effective crisis measures, effective crisis prevention and wishes for support during the pandemic (in % of all coded answers).

	t ₁	t ₂	t ₃	t ₄
Private Stressors				
Caregiving Duties	6.1	4.5	5.3	0.0
Economic and Domestic Obligations	2.4	3.0	1.6	0.0
Health Concerns	3.6	3.1	3.4	5.7
Romantic Relationships	0.0	0.0	0.0	0.0
Social Distancing	0.0	0.0	0.0	0.0
Worries about Relatives	6.6	7.4	6.6	8.6
Empty/ No Answer	81.3	82	83.1	85.7
Main Tasks				
Border Control	2.0	1.5	1.6	0.0
Corona Patrol	42.8	39.1	30.3	20.5
Criminal Investigation	6.3	5.2	7.7	0.6
Emergency Call Taking and Dispatching	0.3	0.7	0.7	0.6
Management Tasks	15.5	14.7	17.7	13.5
Off Duty	0.4	0.7	0.8	0.6
Office Service Tasks	8.4	8.2	8.5	10.8
Usual Patrolling Service	21.6	27.1	29.5	50.6
Empty/ No Answer	2.7	2.8	3.2	2.8
Work Stressors				
Leadership Communication	13.7	10.1	8.2	1.8
None	22.9	26.0	31.3	35.4
Operational Tasks	2.1	6.2	4.9	12.4
Risk of Infection	23.2	15.9	12.1	13.3
Sense of Purpose	1.6	1.2	1.8	1.8
Uncertainty about Future	2.0	1.6	1.1	0.9
Uncertainty in Action	5.8	6.7	5.3	8.8
Working Circumstances	9.2	11.7	13.7	9.7
Working Hours and Annual Leave	9.1	10.0	7.9	3.5
Empty/ No Answer	10.4	10.6	13.7	12.4
Effective Crisis Measures				
Additional Authority for Action	2.0	2.1	1.7	2.4
Hygiene Measures	8.8	8.8	10.1	13.8
Information Supply	3.1	3.7	3.6	10.6
Measures of Restricted Civil Contact	21.7	16.9	16.3	13.0
None	29.5	32.6	34.1	18.7
Others	0.2	1.8	2.5	4.9
Personnel Measures	16.7	18.1	12.9	17.9
Social Support	0.8	0.3	0.1	0.0
Structural Adjustments	2.8	2.4	1.8	0.0
Unsatisfactory	0.8	1.4	1.6	4.1
Empty/ No Answer	13.6	11.9	15.3	14.6
Effective Crisis Prevention				
None	47.9	46.9	45.4	31.3
Off Duty Training	2.3	1.4	1.3	0.0
Organizational Resources	11.6	12.5	12	13.1
Police Training	11.1	10.9	12.1	16.1
Psychology	3.4	4.3	3.3	10.1
Work Experience	4.2	4.8	4.5	2.1
Empty/No Answer	19.5	19.2	21.4	27.3
Wishes for Support				
Compatibility of Work and Family	1.2	1.4	1.6	0.0
Corona Protection	30.9	18.1	15.1	19.5
Governmental Measures	5.4	7.3	6.1	5.3
Information Provision	18.1	19.0	19.5	15.9
Leadership Support	4.8	7.5	8.6	14.2
Personnel Adjustments	11.6	15.1	11	3.5
None	9.9	12.5	13.7	15.9
Empty/ No Answer	18.1	19.1	24.4	25.7

Note. Numbers in bold represent the three most frequently mentioned stressors.

geted COVID-19 interventions such as vehicle controls or dissolving “COVID parties” were mentioned. In Austria and Spain, police officers were also responsible for the delivery of notifications about home quarantine and controlling the compliance. In this context, officers reported an increasing demand to care for the “*unsettled civil population*” (male Austrian officer, 59 years, t_1) by informing and educating about the current governmental measures and recommendations, either via phone in the office service or in conversations during patrols:

Police Department received/receives continuous and all-day phone calls asking questions about the current crisis. To be honest I/we felt like employees of a customer support hotline.

(male Austrian officer, 25 years, t_1)

At the beginning of the COVID-19 pandemic, police officers' main tasks focused on corona patrol. Regular police tasks seemed to be displaced by these tasks initially, but then steadily gained in importance replacing the corona patrol (see Table 4). This apparent interference of the corona patrol with the regular police work was explicitly expressed by the officers, either through complaints about the extra workload or through the demand to neglect their regular tasks:

Mainly the monitoring of the social distancing rules. Most of the important police activities that were considered indispensable in the past are suddenly no longer relevant.

(male German officer, 44 years, t_1)

Given that the sample consists of ca. 15% command staff, their focus of police work during the COVID-19 pandemic was on management tasks including human resources planning, administration, and information supply. The command officers recognized the need for strong leadership by stating “*much leadership required*” (male German officer, 59 years, t_1).

Trying to cope with the flood of e-mails as well as innovations, instructions, service regulations, recommendations; trying to keep an overview; informing employees about current processes and legal situations.

(male German officer, 44 years, t_1)

2.3.3. Work stressors

While some officer reported severe signs of strain (“*I feel burned out*”; male German officer, 53 years, t_1), roughly a quarter of the officers stated to experience no work stressors with increasing numbers at each measurement point (see Table 4). At the beginning of the pandemic (t_1), the risk of infection and deficient leadership and communication emerged as the main stressors with decreasing numbers at each measurement point (see Table 4). Instead, working circumstances as stressor gained importance in the middle of the survey period.

The risk of infection included two facets: the risk of getting infected and being a risk for others, especially for family members. Two main reasons for the risk of infection as a stressor can be identified in the officers' reports: civilians' unwillingness to comply with the social distancing rules and the lack of PPE. At the beginning of the pandemic, many officers had no protection equipment at all, and supply of PPE was perceived as slow or inadequate (had to be bought by themselves or at team level).

Absolutely unsatisfactory protective equipment / the feeling that “the service and functioning of the police force prevails over police officer's health”.

(male German officer, 55 years, t_2)

Uncertainty about whether you yourself have been infected or whether a colleague has been infected is psychologically very

stressful, as there is a high probability that you will infect your own family.

(male Austrian officer, 25 years, t_2)

In the context of civilians' unwillingness to comply with social distancing rules, officers occasionally reported observations of increased potential of aggression against police authority:

The atmosphere outside is grimmer, [...] there is more resistance and rebellion towards cops.

(male Dutch officer, 24 years, t_2)

Mentally unstable persons are overwhelmed by the crisis, which is why there is an increased number of police interventions, failure to keep a safe distance, persons who are overwhelmed with their feelings/fear and express this in aggression, unwilling to accept the danger of the virus or do not want to admit it.

(male Austrian officer, 43 years, t_2)

People are becoming more detached, more aggressive. That's what they vent on us police officers.

(female German officer, 49 years, t_3)

The perceived deficient leadership and communication at the beginning of the pandemic is mainly attributed to an information overload with daily changing laws, regulations, and orders that do not contain clear instructions for action. Some of these ambiguities seemed to appear on a governmental level due to legal vagueness (“*Legal imbroglione*”; male Austrian officer, 24 years, t_2) and rapid change of regulations. On the organizational level, the interpretation of the regulation and implementation of the measures had to be conducted at short notice. Some officers perceived this as a “*constantly changing actionism of the entire leadership*” (male German officer, 29 years, t_1). Additionally, some officers observed that responsibilities were not clearly assigned, leading to the “*occasional practice: many cooks spoil the broth*.” (male German officer, 60 years, t_1) and inconsistency in orders. In turn, the executive officers felt burdened by unfiltered, constantly changing information and unclear, inconsistent instructions both on the governmental and organizational level. This ambiguity in information resulted in an uncertainty of action, which did not allow “*a self-confident and correct intervention*” (Austrian officer, 28 years, t_1).

Changes and adaptations of the service to new needs. Interpretation of the rules. Implementation of the measures. Managing uncertainty.

(male Spanish officer, 57 years, t_3)

The rapid changes. What was valid yesterday is no longer valid tomorrow.

(male German officer, 50 years, t_1)

“What I need I won't get, what I get I don't need.”

(male Austrian officer, 54 years, t_2)

In the context of the vague legal situation, for some officers, the enforcement of the governmental measures triggered dissonance between their actions and beliefs. Some officers did not perceive the corona patrols to be effective, especially because they came at the cost of cutting the regular criminal investigation. Other officers wondered about the righteousness of the governmental measures in the face of liberal, democratic principles. In this sense, some officers felt stressed by their accountability towards the civil population to only enforce legitimized, righteous regulations.

To curtail citizens in their fundamental rights is an unpleasant task.

(male Austrian officer, 42 years, t_3)

Due to an unclear legal situation and mediation by the government that certain activities are forbidden, although they are only recom-

mendations without punishment, an expectation by the public arises, which I, due to the lack of a legal situation, cannot fulfil.

(male Austrian officer, 57 years, t₁)

For working circumstances in the middle of the observation phase, two main themes emerged. First, officers were bothered by the need to comply to all hygiene measures, especially wearing the oronasal masks in the patrol cars. Second, officers reported to be stressed by the need to socially distance themselves from their colleagues and by deteriorated team climate due to an overall intense situation.

2.3.4. Effective crisis measures

Roughly a third of the officers reported no effective crisis measures have been taken (see Table 4). Different reasons for this answer can be derived from their reports: a) no measures have been taken because no measures were necessary, b) measures should have been taken, but they were not, c) measures have been taken but were not sufficient or effective, and d) measures that have been taken aggravated the work.

There are no crises, these are home made!!

(male Austrian officer, 57 years, t₂)

None, since everything seems rather aimless and senseless.

(male German officer, 35 years, t₂)

None, there are too many and confusing. A clear, generally valid instruction for action and not constant changes would be necessary.

(male German officer, 35 years, t₁)

Measures taken are necessary but make everyday business more difficult.

(male German officer, 32 years, t₁)

The remaining officers mainly perceived three measures as effective: measures to restrict civil contact, personnel measures and the provision of PPE as a hygiene measure (see Table 4). It appears that the perceived effectiveness of these measures varies across the countries: In Austria, measures to restrict civil contact are mostly mentioned, whereas German and Dutch officers mentioned personnel measures more often. In Spain, hygiene measures seemed to be most important for the officers (see Supplement Table S3).

The measures to restrict civil contact can be differentiated into governmental and organizational measures. Both aim at reducing the number of contacts and therefore, the risk of infection. Governmental measures include the social distancing regulations, prohibition of access or residence in public spaces, event cancellations, and closure of restaurants, bars and night clubs. Police officers reported that those measures reduced passenger and car traffic resulting in smaller numbers of criminal offences. In this context, some officers explicitly commended the communication of the governmental measures as this has raised awareness in the civil population helping to justify police interventions.

No party scene, no alcohol, no prostitution, practically no bodily harm and assault during the night hours, our normal street life (party scene) has totally stopped. Only monitoring of the Covid19 measures.

(male Swiss officer, 61 years, t₂)

Raising public awareness through the political structures.

(male Swiss officer, 24 years, t₂)

Media communication of the measures as a basis for argumentation when intervening.

(male Austrian officer, 25 years, t₃)

Most of the organizational measures aimed at reducing public access and traffic within the police stations. Police officers mentioned measures, such as promoting online police services, changing the processes for police reports and limiting the conduction of police interviews to serious offences only. Clearly, those measures only targeted the officers in the office service, whereas officers in the field service seemed to benefit from the governmental measures. One officer explicitly stated that “*compliance with the COVID-19 measures led to a reduction in work only for the office service but this was far overtaken by the monitoring of measures*” (male Austrian officer, 50 years, t₃).

Regarding personnel measures, LEAs aimed at increasing the availability of personnel, while at the same time they implemented measures to limit the interaction between officers. The increased number of available officers was mainly achieved by the suspension of annual leave and in Austria by calling in police cadets. Both commanders and officers approved the suspension of leave. Commanders reported that the increased availability of personnel facilitated duty rostering, while executive officers noted the burden sharing between all officers resulting in reduced overtime hours and better planning reliability for leisure activities.

Noticeable caring measures by the employer (change in the shift roster/regulations).

(male Austrian officer, 34 years, t₂)

Suspension of leave, as all available officials are on duty and the burden is therefore shared.

(male Austrian officer, 28 years, t₃)

However, having too much personnel on duty was also perceived as a risk of infection waves, especially when not limiting the interaction between officers. Consequently, LEAs were forced to implement measures preventing superspreading of the SARS-CoV-2 across the police force. Therefore, some officers were allowed to work from home if possible. However, some answers indicated that the unequal availability of home office possibilities might also cause conflicts within the police:

[...] I expected more active support from the homeworkers! Not once did they come forward to assist. There are only a few colleagues of whom I know they were actually working.

(female Dutch officer, 51 years, t₂)

Officers on duty in the departments perceived adjustments to the shift roster as effective, with different types of shift rosters being mentioned (e.g., rotating shifts, group service, 12- or 24-h duties). Additionally, some officers also mentioned fixed patrol dyads and the stop of replacements in other police stations. At the beginning of the pandemic, police officers reported that their departments operated at minimum number of staff which allowed them releases from service. The additional leisure time through releases from service was perceived as an opportunity for recreation and relaxation:

We have switched to A and B groups that do not meet.

(male German officer, 43 years, t₁)

The possibility of temporal and spatial separation through generous release from service regulations to maintain the functioning of my department.

(male German officer, 59 years, t₁)

The possibilities of release from service give possibilities to “switch off” and “come down” at home.

(female German officer, 26 years, t₁)

For hygiene measures, officers most frequently mentioned the supply with PPE. Additionally, they listed spitting protection in in-

interviewing rooms, enforcing safety distance in the office or switching to telephone/online conferences.

2.3.5. Effective crisis prevention

Nearly half of the officers reported that no measures in preparation for crises were taken (see Table 4). Analogous to the acute crisis measures, different reasons for this answer can be derived from the officers' reports: a) preventive measures should have been taken, but they were not, b) no crisis prevention was possible because the situation was unexpected and dynamic and, c) the measures taken were not sufficient enough. Irrespective of the judgment how prepared they felt, some officers pointed out that there was no specific crisis management or pandemic-specific training. Additionally, some officers perceived no crisis prevention measures on an organizational level, but emphasized the use of individual strategies.

None. The police are as overwhelmed as the citizens themselves.
(female German officer, 38 years, t₁)

There can be no advance provision for a crisis of this magnitude and nature, as there has been no such situation since the last world war. Measures in the preparation for a crisis could also not be anticipated by the employer.
(male Austrian officer, 58 years, t₂)

In general, the training is helpful; however, I believe that in the current situation, the character and nature of each individual influences the coping with COVID-19.
(male Austrian officer, 47 years, t₁)

The remaining officers perceived mainly three factors as effective in the crisis prevention: police training, general work experience, and organizational resources (see Table 4).

For police training, the officers mostly mentioned the transfer of skills acquired in scenario-based situational response training. The officers reported that the situational response trainings generally prepared them for “*unusual and chaotic situations*” (male German officer, 38 years, t₁). Foremost, they described self-protection as the key principle in training that has conditioned them to keep a safety distance to the police vis-à-vis. Additional skills acquired in the situational response training were target-oriented communication and stress regulation. Besides situational response training, officers also reported hygienic training and the understanding for legal regulations as effective crisis prevention measures in police training.

Self-safety is very important during the training. This idea is firmly anchored.
(female German officer, 29 years, t₂)

Distance and hygiene always play a major role in daily service/handling of people. No change, because you are “conditioned” for it.
(female German officer, 45 years, t₂)

Besides training experience, some officers reported work or life experience as an effective resource during the pandemic. They did not describe specific skills acquired through work experience, but rather summarized this as “*common sense*”. Occasionally, officers reported that experiences and lessons learnt with other viruses (e.g., avian influenza) or crises (e.g., wave of refugees 2015/16) prepared them for the COVID-19 pandemic.

Experience, common sense, crisis management training in other contexts.
(male Spanish officer, 57 years, t₄)

Due to my decades of field service experience, the so-called crisis prevention is based on routine, common sense and simply listening to people.

(male Austrian officer, 53 years, t₃)

Organizational resources describe the self-concept as police and refer to competencies that are attributed to the organization and all its members. These competencies included hierarchy, flexibility of action, and competence of decision making. However, officers mostly mentioned internal channels of information, including emails, intranet, or support by COVID-19 task forces.

It's up to police officer to respond adequately to special situations. To be practical and solution-oriented. By definition, we are good at that.
(male Dutch officer, 51 years, t₂)

The ability of the police to be resilient and to cope with adversity.
(male Spanish officer, 57 years, t₃)

The fact that every day in the police service can bring the unexpected and requires mental and physical flexibility clearly helped to deal with the COVID19 crisis, in which new instructions and guidelines for action were communicated daily.
(female Swiss officer, 28 years, t₂)

2.3.6. Wishes for further support

[...] *We do not need blah-blah, but recognition without empty words*
[...] *Security that we will not end up spooning the soup, physically, financially and emotionally.*

(female German officer, 40 years, t₂)

In the officers' wishes for further support, three areas for action can be identified (see Table 4). First, further protection measures against SARS-CoV2 were requested, especially at the beginning of the pandemic and in Spain (see Supplement Table S3). This progression corresponds well with the findings on risk of infection as the main stressor at the beginning of the pandemic and that Spanish officers perceived the PPE as the most effective crisis measure. In the first half of the survey period, officers also suggested personnel adjustments (see Table 4), especially in Austria, Germany and Netherlands (see Supplement Table S3). Throughout the entire survey period, officers required improved forms of information provision (see Table 4).

Requests for further protection measures mainly comprised of the need for more and better PPE. Some officers even reported that they did not have any PPE at the beginning of the pandemic. Others reported that they needed to share too little resources among too many officers within their department and used privately acquired PPE. A few officers suggested widely applied testing or medical checks for police officers to minimize the risk of infections within the police force and in order to protect officers' families. Acknowledging the dilemma of more officers on duty (due to the suspension of annual leave) and the need to limit interaction, officers requested stricter policies for physical segregation of colleagues in departments and asked for hygiene information.

More protective equipment – It is widely reported in the media that police officers must now wear masks, but these are not available in sufficient numbers.

(male Austrian officer, 26 years, t₁)

For personnel adjustments, there are inconsistent reports whether personnel strength should be increased or minimum number of staff in the department should be decreased to limit interactions between officers. Therefore, some officers demanded building personnel re-

serves in order to maintain functioning in case of infections, including the approval of the suspension of annual leave for this purpose. Other requests targeted the organization of the working time: Some officers asked for more home office possibilities, while they also noted that adequate technical equipment needs to be provided in this case. Other officers claimed flexible working hours and an increase in resting periods (in some cases this meant stopping the suspension of annual leave).

As is the case in many departments, our department currently shows that too much personnel has been cut in recent years. Retired / transferred colleagues are only replaced after months / years or not at all.
(male Austrian officer, 34 years, t₁)

As there are currently a lot of colleagues on duty at the police departments due to a ban on leave, cancellation of training etc., it would be urgently necessary to keep a part of the staff in reserve. The distance regulations cannot be observed at my and many other police inspections, as far too many people are on duty. If someone should ever test positive, the whole service will be out of action for a long time. However, with a reserve of staff the service could be maintained.
(male Austrian officer, 56 years, t₂)

Officers' suggestions for information provision mainly targeted the style of communication. Information should be clearly structured and transparent. Various sources of information should be pooled into a single source to facilitate access to all relevant, up-to-date information (e.g., FAQ, newsletters once a day). Additionally, some officers asked for training including hygienic training as well as a general preparation for exceptional situations.

Superior departments and various task forces should pre-filter and compress information in order to contain the flooding of the first responders with new guidelines and information. Before new instructions and information are forwarded, the essential contents should be worked out.
(male Austrian officer, 33 years, t₁)

Hygiene training would perhaps be something, behaviour in exceptional situations and by this I mean other scenarios that could occur. A good preparation would certainly be helpful.
(female Swiss officer, 34 years, t₂)

Roughly 10% of the officers reported no further wishes for support during the COVID-19 pandemic, especially at the end of the survey period. There are slight differences between countries: While all Spanish officers asked for further support, a third of the Dutch officers mentioned no wishes (see Supplement Table S3). It is striking that most of these reports comprised statements about general satisfaction with the measures. However, some limited this satisfaction to the current time point indicating that they were not satisfied at the beginning of the pandemic or that the support might not be sufficient in the future (e.g., when the pandemic worsens). Interestingly, in the officers' compliments, they addressed coping at the individual, organizational, and governmental level:

Basically, everyone tries very hard to the best of their possibilities.
(male Austrian officer, 39 years, t₁)

The superiors and the command do what they can, currently no suggestions for improvement.
(male Austrian officer, 36 years, t₁)

In principle, I am satisfied with the measures taken by the Federal Government.
(male Austrian officer, 29 years, t₂)

3. Discussion

Police officers have faced a multitude of challenges during the COVID-19 pandemic, and they need support through an effective crisis management to successfully cope with the demands. LEAs must develop a realistic understanding of the officers' stress experiences as well as the different coping resources officers use to manage the distressing state. Such awareness is beneficial, not only to guarantee police functioning during pandemics, but also to facilitate officers' stress coping abilities and well-being. In a longitudinal design, the present study examined experiences reported by officers from five European countries from a stress and coping perspective. On average, officers seemed to tolerate the stress experiences during the pandemic with slight decreases of strain over three months after the lockdown. Although there is substantive variance of strain among countries, large inter-individual differences in strain were observed. Confirming our hypotheses, stressor appraisal, emotion regulation, preparedness, sex and working experience significantly predicted strain during the pandemic. Risk of infection and deficient leadership and communication emerged consistently as main stressors. In line with the large inter-individual variance in the statistical analyses, officers' perception of the effectiveness of various coping resources on a governmental, organizational and individual level differed greatly.

3.1. Police officers' strain appraisal processes, and coping resources during the pandemic

Overall, officers seemed to tolerate the stress experiences by the pandemic. At the day of the lockdown, an "average" officer (male, 17.22 years of work experience) had a medium strain level of 3.56 on a scale ranging from 1 to 7. Hypothesis 1 predicted that strain would vary during the pandemic dependent on the severity of the pandemic and the effectiveness of the crisis measures. Indeed, strain levels significantly decreased by 0.24 over three months after the lockdown ($-0.02 \times 12 \text{ weeks} = -0.24$). Therefore, it can be speculated that strain might have been slightly higher than usual at the beginning of the lockdown, although our data allows no comparison to strain before or after the pandemic. Since neither stress appraisal nor emotion regulation and preparedness significantly interacted with time after the lockdown, it remains unclear if the pandemic as stressor or the effectiveness of the coping resources caused the decrease in officers' strain. Nevertheless, the additional strain at the beginning of the lockdown might be explained through the reported extra work of corona patrols, which interfered with regular police tasks. After three months, most of the officers reported that they could return to regular police tasks, which reduced their work load. Since changes are rather small and officers are considered chronically stressed in the literature (Allison et al., 2019; Giessing et al., 2020) Planche et al., 2019; Violanti et al., 2016), it seems plausible to assume that the "average" officer was only mildly affected by the pandemic.

Confirming hypothesis 2, there was substantive variance between countries, with German officers being most strained followed by Spanish, Austrian, Dutch, and Swiss officers. The severity of the COVID-19 pandemic, its impact on the national health system, and the effectiveness of the governmental measures in each country as well as differences among the LEAs (i.e., federal vs. national police, different regions within one country) might account for these differences. Additionally, variance among the countries might be (partially) attributed to systematic differences in officers' demographic characteristics (i.e., sex and work experience; see Table 2), as indicated by reduced Level 3 variance when entering these variables in

the final model (see Table 3). Despite the substantive variance between countries, most of the overall variance of strain in the final model (66%; see Table 3) was at the individual level, suggesting that interindividual differences determined strain more than differences between countries.

Confirming hypothesis 3, sex significantly predicted strain, with women being more strained than men (i.e., additional 0.21 on a scale ranging from 1 to 7). This finding is in line with literature on gender differences in police officers' perceived stress in response to the 9/11 terrorist attack (Bowler et al., 2010). Given that the pre-employment screening and training are similar for police women and men, the findings of elevated strain in women need to be further investigated to better understand its cause and to identify and implement preventive measures. Post-hoc analyses of cross-level interactions yielded a significant interaction of sex and preparedness indicating that men experienced less strain than women when feeling averagely prepared.

In addition, hypothesis 4 predicted that work experience would decrease work stress (Katana et al., 2019; Landman, Nieuwenhuys, & Oudejans, 2016). Indeed, work experience significantly reduced officers' strain during the pandemic. Officers' reports about work or life experience as a relevant coping resource affirm the statistical findings. The effect of work experience might be attributed to the appraisal of a higher availability of coping resources. Since work experience and age are correlated, it cannot be distinguished if specific police skills or general life skills were responsible for this effect. In line with hypothesis 6, feeling prepared for the pandemic through training significantly reduced strain. This finding is underpinned by officers' descriptions about the specific police skills that helped them to cope with the pandemic. Specifically, they mentioned keeping safety distance, communication skills and stress regulation which they have acquired in situational response training. However, there are also reports in which officers did not mention specific skills, but rather labelled it as "common sense". Following the line of general life skills, Katana et al. (2019) suggested that individuals with advanced age have learned how to use more efficient emotion regulation strategies. Dependent on the strategies, emotion regulation can either decrease or increase (work) stress and related stress responses (Brans et al., 2013; Katana et al., 2019; Richardson, 2017). Confirming hypothesis 7, engaging in maladaptive emotion regulation, i.e., rumination and expressive suppression, was associated with higher strain. In contrast, the use of adaptive emotion regulation, i.e., reflection, reappraisal, social sharing and distraction, reduced officers' strain during the pandemic.

Besides the availability of coping resources, hypothesis 5 predicted that strain would also be impacted by the stressor appraisal (Lazarus & Folkman, 1984). Negative appraisals of the pandemic as stressful, threatening, uncontrollable, and challenging significantly increased officers' strain during the pandemic. The use of the Transactional Stress Theory (Lazarus & Folkman, 1984) or alternatively the GST (Agnew, 1992) allows to explain police responses to stressful circumstances, such as pandemics or in use of force incidents and in the long run, to predict behaviour and to intervene if necessary.

In sum, while the "average" officer is rather moderately stressed by the pandemic, the quantitative and qualitative results demonstrate that there is a large individual variance and diversity in the stress responses. Analyses showed that women, officers with less working experience or those not feeling prepared, appraising the pandemic as stressful and utilizing maladaptive emotion regulation are at risk to experience severe stress. Given the persistence of the pandemic, chronically elevated stress levels might jeopardize officers' psychological and physical well-being (McEwen & Stellar, 1993). Therefore, the identification of risk factors for less effective

copied with COVID-19 related stress helps LEAs to direct their resources towards the officers in most need of mental health services.

3.2. Implications for effective crisis management

For effective crisis management in the pandemic, the perceived stressors need to be addressed on a governmental, organizational and individual level. From the officers' reports, two major stressors or areas of concerns consistently emerged: Risk of infection and information provisioning through leadership and internal communication to reduce uncertainty in action. Both the statistical and qualitative results of the present study allow to derive recommendations on how to successfully cope with these stressors.

3.2.1. Governmental measures

On the governmental level, the local lockdowns and social distancing policies, whether compulsory or voluntarily, were reported as facilitating the police work. This finding contradicts concerns in an American narrative that social distancing could increase the number of service calls due to violations of the policies (Jennings & Perez, 2020). Although reports of certain offences including vandalism and domestic violence have increased during the COVID-19 pandemic, overall, calls for services have slightly decreased (Campedelli et al., 2003; Mohler et al., 2020). Nevertheless, monitoring the compliance with the governmental measures on the corona patrol and educating civilians about the current regulations were officers' main tasks at the beginning of the lockdown. Therefore, the officers emphasized that clear, understandable laws are important for legitimized and self-confident police interventions. While public health departments lead the actual response to the pandemic, LEAs are expected to be "the voice of authority, calm, and guidance" (Brito, Luna, & Sanberg, 2009, p. 1). Consequently, officers are tasked with communicating the voluntary and mandatory measures, the values of compliance with these measures for the common good, reassuring frightened civilians, and the consequences for violations (Jennings & Perez, 2020). Governments have supported the officers in the enforcement of these policies by effective media communication and public safety initiatives. Nevertheless, we found reports of increased potential for aggression against police officers at an early stage of the pandemic in our data. Given the developments of violent riots during the pandemic (Stogner et al., 2020), e.g., in Stuttgart, Germany or Belgrade, Serbia, officers seem to be a sensor for rising social discontent with the governmental measures. Therefore, governments should take officers' experiences of increasing resistance seriously, implement early-warning systems to detect rising conflicts, and support the police in the prevention of social disorder by inclusive leadership and legitimacy of authority (Reicher & Stott, 2020). This is especially critical because public health policies during pandemics might also limit possibilities of positive interactions of the police with the community in outreach initiatives or community activities (Jennings & Perez, 2020).

3.2.2. Organizational measures

Officers' reports about the availability and effectiveness of organizational measures were inconsistent. While some officers perceived no measures at all or insufficient measures, other officers did list effective measures. However, even among those, the assessments of the effectiveness differed, since benefits and costs of each measure were considered and differently weighted. The measures perceived as effective by the officers were mainly aimed at reducing the risk of infection, which was identified as one of the main stressors. Above all, LEAs should prepare for pandemics by stockpiling PPE, including masks, gloves, gowns, eyewear, and hand sanitizer, to ensure an immediate and sufficient supply at all times (Brito et al., 2009; Jen-

nings & Perez, 2020). However, prolonged use of PPE and adherence to safety health policies might distract police officers from other obligations, causing additional physical and mental fatigue (Chen et al., 2020; Stogner et al., 2020; Tsamakidis et al., 2020). Therefore, LEAs should include the costs in their performance expectations and constantly re-evaluate the necessity of those measures based on officers' experiences. Secondly, LEAs reduced the risk of infection by personnel adjustments. To minimize the contact between officers, LEAs suspended roll-call and instituted 50/50 work plans by dividing the department's employees in half and keeping the two groups completely separate (also see Jennings & Perez, 2020). At the beginning of the pandemic, they also reduced the staff on duty or present in the departments through releases and possibilities to work remotely. However, the officers' reports showed that these measures require far-sighted planning (e.g., providing technical equipment for remote work) and good internal communication, so that no conflicts or perceived inequity between colleagues may arise. Additionally, some officers started to complain about too many officers present in the departments during the pandemic due to the suspension of annual leave. While command and executive officers appreciated the burden sharing between all officers, LEAs should keep the number of staff on duty at a minimum and use the personnel reserves as back-up in case of high infection numbers (Brito et al., 2009). Thirdly, LEAs reduced the risk of infection by limiting the interaction with the public. In the officers' reports in the present study, those measures including focussing on the investigation of critical incidents or felonies only and expanding online reporting options or call centers mainly benefited officers being on duty in departments. In the literature, there are also reports of measures that aim at protecting street patrol officers in the field, including suspending protocols that put people in custody or handling non-violent and non-emergency calls via telephone (Jennings & Perez, 2020). Additionally, dispatchers can be instructed to divert calls for service to public health services if a police response is not necessary. In case a police response is necessary, dispatchers could screen for COVID-19 symptoms of the caller to prepare the dispatched officers (Jennings & Perez, 2020). However, many of these measures come at the cost of regular crime investigation, which led to a loss of sense of purpose for some officers. Officers' concerns about the fundamental responsibility of police work should be acknowledged by the superiors to ensure job satisfaction.

Addressing internal communication, officers reported effective measures less frequently. Nonetheless, information provision emerged as a main theme requiring further coping resources. Officers reported to be stressed by an overload of ambiguous, rapidly changing and sometimes contradictory information, which led to uncertainty in action. Therefore, strong leadership is warranted that addresses this uncertainty. Milliard and Papazoglou (2020) recommend leaders to educate and regularly update their teams using valid knowledge from established organizations. As indicated by the officers' reports, LEAs should make use of the hierarchy, which was named as one organizational resource, by pooling and filtering information from various sources in a superordinate authority. Then, information containing relevant and clear instructions for action should be distributed to the different target groups within the authority. In their reports, officers mentioned FAQs, daily newsletters or help telephones as best practices.

In organizational crisis prevention, police training plays a central role as indicated by the negative association of feeling prepared through training with strain and by the officers' reports. Besides the request for training on health and safety precautions during a pandemic (Brito et al., 2009; Jennings & Perez, 2020), our results revealed that skills acquired in the regular police training, especially self-protection, communication and stress regulation, can be trans-

ferred to the context of a pandemic. Officers mostly rated situational response training as effective. Confirming the effectiveness of situational response training, some officers asked for more training for exceptional situations. This is in line with the general request for more frequent and realistic police training (Di Nota & Huhta, 2019; Renden, Nieuwenhuys, Savelsbergh, & Oudejans, 2015). To ensure that the majority of the officers benefits from training experiences, transferability into real-world contexts can be achieved by training under stress (Nieuwenhuys & Oudejans, 2011) and following the recommendations of non-linear pedagogy (Körner & Staller, 2018).

3.2.3. Individual measures

As demonstrated by the large inter-individual variance in the statistical analyses, individual stressor appraisal and emotion regulation might outweigh governmental and organizational measures to cope with the pandemic. As officers are predicted to continue to deal with the stress caused by the pandemic in the upcoming months, it is important for departmental leadership to reduce stress as much as possible, and for officers to identify positive coping strategies (Stogner et al., 2020). While individuals are certainly required to engage in active coping themselves, LEAs can support their (vulnerable) members by educating on healthy coping strategies (Milliard & Papazoglou, 2020). For emotion-focused coping, reappraisal, reflection, distraction and social sharing have been identified as adaptive. For problem-focused coping, LEAs can reduce uncertainty by providing information or giving advice on how to handle the uncertainty, building on existing knowledge and skills officers have acquired in police training. Although officers reported to be more stressed by the uncertainty than the (long) working hours, LEAs should give officers enough resting hours and opportunities to engage in positive coping strategies (Milliard & Papazoglou, 2020). LEAs should provide professional psychological support and leaders should encourage officers' seeking of such programs (Rooney & McNicholas, 2020). However, these programs are often criticised as the hyper-masculine culture of the police discourages officers to seek external help. Therefore, programs that target positive coping skills through peer networks in partnership with clinicians (Papazoglou & Tuttle, 2018; Stogner et al., 2020) or in the standard training curriculum (Papazoglou & Andersen, 2014) are often recommended.

In sum, the police carries great responsibility in the effort to control pandemics. Therefore, effective management is crucial to protect officers' functioning, well-being, and health. Reducing officers' stress by increasing public awareness for the necessity of measures, providing sufficient PPE, reducing uncertainty by unambiguous information, preparing officers for exceptional situations, and strengthening their individual coping resources may be an effective approach to safely lead them through the pandemic without compromising officers' performance (Hope, 2016; Nieuwenhuys & Oudejans, 2017; Stogner et al., 2020) or well-being (McEwen & Stellar, 1993).

3.3. Strengths, limitations and further directions

Substantiating narratives about police stress, mental health, and resiliency (Jennings & Perez, 2020; Rooney & McNicholas, 2020; Stogner et al., 2020), this is the first study to provide empirical data on officers' stress experiences during the COVID-19 pandemic. The mixed-method approach allowed us to test hypotheses that could confidently be derived from the traditional stress research, but also to capture the novel stressors and the variety of coping resources due to the unprecedented state of a global pandemic. Major methodical strengths of the study are the longitudinal design and the inclusion of five different European countries. However, only 10% of the participants completed the questionnaires at three mea-

surement points, which overidentifies linear trajectories. Given the missing data, the integration of random slopes in the growth curve model would have been based on a large proportion of estimated data. Therefore, we only included fixed effects in the models. To increase sample sizes, we encouraged the responsible person in each LEA to widely distribute the online survey among their accessible work force, resulting in limited control of the size, region and demographic characteristics in each subsample. As a consequence, geographic distribution over the respective country, types of LEAs (e.g., federal vs. national police) and demographic characteristics of participating officers differed among countries. Thus, caution must be taken in the interpretation of the results: Austria and Germany are overrepresented in the data, the representativeness of the sample in each country might be limited and cross-country differences might be (partly) attributable to demographic differences, as has been the case for sex and work experience in the statistical analyses.

The present study assessed officers' stress experiences and coping on duty and at the workplace. To reduce participants' burden based on questioning them, we used questionnaires originally developed for ecological momentary assessment. Therefore, findings might be limited by the use of single-item measures. To counteract the associated reliability concerns, we calculated summary indexes (i.e., strain, stressor appraisal, adaptive and maladaptive emotion regulation) when possible. Nevertheless, data might be biased by daily fluctuations since we did not control for potential daily confounding factors (e.g., off- vs. on-duty, type of the shift, timing in the shift, etc.). Finally, to receive authentic reports, officers provided their answers in their mother tongue. For coding, data units were analyzed in the respective language, but categorized into an English coding system. This procedure required coding by five different coders (four raters speak German and Dutch as their mother tongue, while one rater had advanced skills in Spanish), which might have resulted in biases in the categorization due to differences between the coders. Caution must be taken in the interpretation of the frequencies for each main category. We used the frequencies of the categories as a tool to identify the emerging main themes and patterns, but our main goal was to give voice to the officers and to get a full picture of officers' stress experiences during the pandemic.

Acknowledging the strengths and limitations, the results of the current study point in direction for further research. First, despite the longitudinal design, the study only captured a short period of the pandemic and epidemiologists already discuss second waves and future outbreaks. Although the present results demonstrate a medium stress level on average, the long-term impact should be monitored, as chronic stress can have tremendous health consequences (Allison et al., 2019; McEwen & Stellar, 1993). Second, the present study only assessed stress experiences through self-report. Future studies could advance our findings using physiological stress measurements, replicating studies conducted before the pandemic's outbreak for comparison (Stogner et al., 2020). Finally, the effectiveness of the implications suggested by our results should be evaluated in experimental designs (e.g., the effects of situational response training on stress regulation in various settings).

4. Conclusion

In the wake of the unprecedented situation, it was likely that the LEAs and police officers were caught unprepared for the potential mental stress that they would experience. However, overall, officers seemed to tolerate the stress with slight decreases over three months after the lockdown. Nevertheless, the large inter-individual variance in strain indicated that female officers with less work experience, feeling unprepared and engaging in negative maladaptive emotion regulation are at risk to develop negative health consequences due to severe work stress. Given the persistence of the pandemic and the

warning of second waves, now is the time for LEAs to prepare the (vulnerable) officers for these situations. Our results suggest that this requires three primary paths: 1) Governments must ensure to enact unambiguous laws and increase public compliance through effective media communication, 2) LEAs must focus on being logistically prepared for viral outbreaks through stockpiling PPE, having policies for building personnel reserves in action, and establishing efficient internal communication channels, and 3) LEAs must provide officers with training to improve skills for positive coping with exceptional situations and stress. Risk of infection and uncertainty were the major sources of stress. By being logistically prepared for an outbreak with PPE, personnel reserves and plans for altering policing strategies, officers should experience less risk of infection. Legislating and communication of unambiguous health safety policies and clear instructions for action should reduce officers' uncertainty and stress. Since it is impossible to completely remove stress from these types of situations, strengthening individual coping resources through training would help officers to deal with the stress they face without the side effects of negative health consequences.

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Appendix A. Supplementary data

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