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FIRST STEPS IN THE DEVELOPMENT OF A MULTILEVEL MODEL OF RESILIENCE FOR THE CZECH ATTITUDE BAROMETER PANEL SURVEY (2024–2027)

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ABSTRACT
This paper presents a multilevel model of resilience for testing with the Czech Attitude Barometer panel survey (CAB, 2024–2027). Individual resilience is defined using the Brief Resilience Scale. Development of the multilevel model of resilience is based on a macro-micro-macro theory that is grounded at the individual-level using Appraisal Theory. Multilevel resilience is theorised to have three facets: individual, community and societal. One purpose of the multilevel model of resilience developed here is to study how polarisation is related to resilience through negative emotions (anger, anxiety and fear) using multilevel statistical methods.
Keywords: resilience; multilevel; adversity; polarisation; emotion

In recent years, the term resilience has gained prominence in addressing our ability to face and overcome a wide range of complex challenges from climate change and economic volatility to political polarisation and public health crises. Both international organizations and national governments have identified 'resilience' as a strategic priority for creating adaptable and sustainable systems capable of withstanding diverse adversaries (Malik et al., 2014; WEF, 2023). A common theme running through many political documents is that as societies face growing uncertainties, understanding resilience at multiple levels – individual, community, and societal – has become indispensable in fostering stable development and promoting long-term well-being. In parallel with increasing relevance in policy making, the debates about resilience have grown into (a weakly integrated) area of study scattered across a wide range of disciplines. These range from early elaborations of the resilience concept in psychology and ecology to recent applications in disaster studies, gerontology and organizational studies (Xu & Kajikawa, 2018; Xue et al., 2018). Several attempts have been made to synthesize the growing resilience literature in an effort to create the basis for a model that would take into account the diverse meanings and multiplicity of scales on which resilience is addressed (e.g. Troy et al., 2023).

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The twin purposes of developing a multilevel model of resilience for testing using a specific national panel survey, the biannual Czech Attitude Barometer panel survey fielded between 2024 and 2027 (hereafter termed MMR-CAB), is to understand (a) current levels of resilience and (b) changes in resilience over time. Therefore, the development of the MMR-CAB aims to conceptualise resilience as a socio-ecological phenomenon that is dynamic; operating simultaneously at the interconnected micro (individual), meso (community), and macro (society) levels.

A general theory of resilience is, in our opinion, very difficult to develop at the moment because of the unresolved normativity at the societal level (Thorén & Olsson, 2018); and the fragmented nature of the debate that has formed around the concept of resilience (Xu & Kajikawa, 2018; Xue et al., 2018). Therefore, without giving up the effort to create a general model, we prefer to approach the problem of increasing our knowledge of resilience in a Mertonian way (Merton, 1968), by staying at the mid-range level; and focusing on validating hypotheses in a specific social context (i.e. contemporary Czech society) drawing on clearly defined theoretical foundations that are applicable for outlining an empirically testable model that is multilevel in nature. Accordingly, our goal in this article is to contribute to this effort by outlining our conceptual multilevel model of resilience for empirical testing using the CAB panel survey.

In order to be able to (statistically) model resilience, it is necessary to measure it. The existence of many contrasting resilience scales underscores a fundamental point: the conceptualisation and measurement of resilience is neither objective nor neutral either in application or consequence. In this respect, Copeland et al. (2020, p. 1) made the insightful point that:

> […] there is a fundamental duality within the very concept of resilience that makes measuring […] resilience profoundly difficult. This duality is best described as a tension between resilience as a characteristic of a community [person or country] as it now exists, and the transformations that will happen within and to that community [person or country] should it survive a severe disruption. The primary way to measure such aspects of resilience is indirectly, through *indicators* [italics in original], since resilience itself is a complex concept. However, current indicators of 'social resilience' […] fail to capture this tension in various ways, and yet they are increasingly being used for policy […]

What this normative warning implies is that great care is required in the conceptualisation, operationalisation, and analysis of resilience scales and indicators. Researcher judgments that a person, community and society have a certain level of resilience; and such resilience is stable or changing over time may have real-world policy consequences. What this means practically is that (1) multiple measures of resilience should be used where possible; (2) cross-validation among resilience indicators should be conducted before coming to final evaluations; and (3) the reporting of the results of the MMR-CAB should be sensitive to nuances and inconsistencies rather than propose bold real-world interpretations and policy recommendations. This is especially important in the study of resilience and social divisions.

A key theme in the design of CAB is the measurement of socio-political polarisation in terms of social identities that lead to opposition between groups. The potential

for polarisation to undermine and weaken resilience is an important theme in current political discussions and scientific research (Croissant & Lars, 2024). To summarise the prevailing view, resilience and polarisation are hypothesised to have a negative association. Macro-level, cross-country analyses lend support to this thesis; however, there is much less evidence about this negative relationship at the meso (community) and micro (individual) levels.

More practically, a key aspiration for the MMR-CAB is that for policy makers, the MMR-CAB might be used as an 'early warning system' that indicates when, for example, community resilience is in decline; where an early intervention is warranted to lessen or prevent further decline. Of course, the advice regarding the normative implications of using resilience indicators highlighted above always remains pertinent. With this caveat in mind, an example of this policy-oriented approach to community resilience is the 'More Resilient Communities' project fielded in the state of New South Wales, Australia. This project implemented a panel survey, similar to CAB, between 2017 and 2022 that has resulted in an online dashboard of community resilience using a customised database composed of 9 domains of resilience measured with 36 indicators (Brown, Schirmer & Amorsen, 2023). This recent Australian experience underscores the value of frequent measurement, which is an important feature of CAB. At the core of our MMR-CAB is the measurement of resilience at the individual-level using a special resilience scale (see below for details) implemented in all waves of CAB.

Our presentation of the MMR-CAB in this paper is structured as follows. In the first section, a macro-micro-macro theory for developing MMR-CAB is outlined, and this is followed in sections 2 and 3 by two micro-theory foundations for the MMR-CAB that focus on (a) feelings of stress and emotion via Appraisal theory and (b) societal division grounded in affective polarisation. Thereafter, in section 4 an operational definition of resilience at the individual-level is presented. Section 5 introduces the operationalisation of MMR-CAB using a three-fold integrated view of resilience: individual resilience (IR), community resilience (CR) and societal resilience (SR). Here it is emphasised that IR, CR and SR may have common or customised sources of data. The penultimate section describes data usage, method of data analysis based on integrating 'within and between analysis' (WABA) with random coefficients models (RCMs), and opportunities for extending previous work on the correlates of multilevel resilience in the Czech Republic. In the final section there are some concluding remarks.

A Macro-Micro-Macro Theory for Developing MMR-CAB

One approach to understanding how resilience might operate at the individual (micro) and contextual (meso and macro) levels is to develop a dynamic sociological conception of MMR-CAB. In this respect, Boudon (1979a,b) and Coleman (1990) both theorised about individual behaviour using a dynamics of interaction explanation. An important caveat with this form of sociological theorising explanation is that it is empirical in being focused on observable phenomena with no pretence to being the only explanation. Consequently, empirical evidence is used to test for the existence of a dynamic sociological

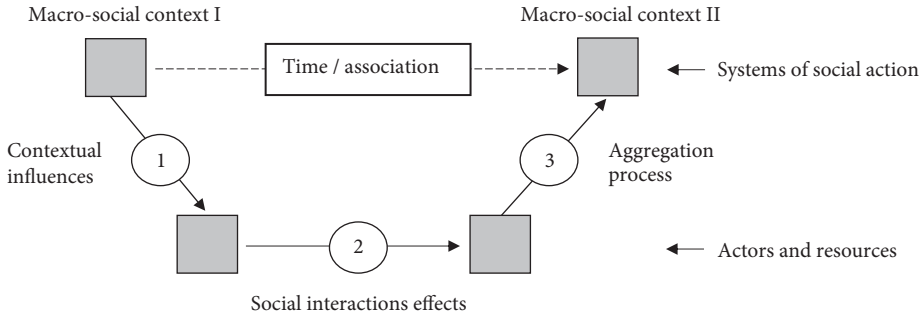

Figure 1: A multilevel macro-micro-macro theory of resilience
Source: authors, adapted from Coleman (1990)

theory that takes context seriously and tests the validity of this theory's assumptions. This is one purpose of CAB. A defining feature of a 'macro-micro-macro' (multilevel) theory are the links between events at the individual (micro), community (meso) and societal (macro) levels. Here for simplicity the focus will be on the micro and macro-levels as shown in Figure 1 where the same logic would also apply to the intermediate meso level which is discussed below.

Figure 1 proposes that establishing a multilevel link between individual action and societal/community context requires 3 steps. First, there is the specification of *contextual influences* that shape the attitudes, beliefs, emotions, and values of individuals (see, arrow 1 in Figure 1). Second, this is followed by defining *social interaction effects* that link individuals' attitudes, beliefs, emotions and values to their actions as shown in arrow 2 of Figure 1. Third, an *aggregation process* helps to explain how individuals' actions and interactions generate various intended and unintended collective social outcomes and these are represented by arrow 3 of Figure 1. This macro-micro-macro theory of MMR-CAB posits that explaining observed (community and) societal resilience requires linking context, social interaction, and aggregation explanations. The inter-individual interactions represented by arrow 2 in Figure 1 are shaped by the social context which includes institutional factors related to local governance, for example. Consequently, individuals are theorised to be simultaneously both the cause and consequence of social reality (Swedberg 2016, p. 252).

Note the bottom part in Figure 1 refers to the individual-level and upper part the societal level. Here individuals are influenced by society (arrow 1); and by each other (arrow 2); and the results of many individual interactions has a subsequent impact on society (arrow 3). Time is inherent in this figure. The dashed arrow at the top of the figure linking macro-social contexts I & II via time or some relationship of association highlights that this theory does not envisage that societal patterns from the past determine current and future social patterns. All change is mediated by individuals (and communities, not shown).

In sum, the theory of the MMR-CAB, presented above, is neither 'top-down' nor 'bottom-up', but contains elements of both allowing for interactions across levels that are both context and time dependent reflecting changes in the real-world that have multiple

origins. Moreover, this multilevel theory does not adhere to methodological individualism as social relations and institutions cannot be reduced to personal characteristics, but also have community and/or societal origins. However, the macro-micro-macro theory, presented above, contends that resilience must ultimately be based on concrete individual relationships rather than interactions between abstract (or emergent) supra-individual entities such as the community and society. This central feature of a macro-micro-macro theory of resilience requires the specification of micro-foundations for resilience. Here the focus will be on two micro-theoretical foundations for the MMR-CAB model: (1) how individuals respond emotionally to stress produced by experiencing unexpected adversity, and (2) the emotional foundations for political polarisation that stem, in part, from stress and feelings of unfairness.

Micro-Theory Foundations of the MMR-CAB: Appraisal Theory

Appraisal theory (AT), and its fore-runner the Transactional model of stress and coping, is a very useful theory in allowing resilience to be studied in terms of individuals' management of stress (Lazarus & Folkman 1984; Lazarus 1991). The definition of stress is that it results from an interaction, or 'transaction', between a person and their (changing) external context. Within AT a stress-based response depends critically on individuals' definition of their situation. Critically, for AT, stress is not determined at the micro or meso/macro levels: it is multilevel in nature, a perspective that matches with the MMR-CAB.

This a key point because, according to AT, two individuals facing the same adverse situation can experience different levels of stress. Much depends on personal resources, such as access to emotional support from family/friends, for dealing with adversity. Specifically, in adverse situations, level of experienced stress is defined by the person and not the community or societal context. Stress is always individualised from the perspective of AT. Again, this emphasis on the individual is a core element of the macro-micro-macro theory outlined in the previous section. Please note that stress at the meso- and macro-levels may be operationalised in at least two ways: (1) as a mean aggregation of individual stress indicators in a specific geographic area, or (2) using official administrative data: this option is discussed below. Focussing here on the individual-level, an AT approach to explaining individual resilience involves two-steps.

In step 1, *primary appraisal* focusses on the immediate personal impact of adversity and is deemed negative when it undermines goals. More generally, primary appraisals define a situation as being irrelevant, benign-positive, or stressful. If stress occurs, there are subsequent appraisals of 3 types: (a) harm/loss: exploring what has already been lost; (b) threat: determining future outcomes; and (c) challenge: which examines what opportunities have become available – this is where resilience begins. In step 2, *secondary appraisal* involves personal perceptions of the long-term consequences of an adverse event. If a secondary appraisal concludes that an external event is overwhelming, then the resulting stress will motivate one of two coping strategies: (1) become 'problem focussed' where the goal is to change the situation or (2) become 'emotion-focussed' where the strategy is to adapt to the new circumstances.

An advantage of using AT as one of the micro-theory foundations of MMR-CAB, is that AT predicts that external adverse events, motivating resilience, will activate negative emotions such as anger, fear and anxiety when personal goals are threatened. Anger is experienced when individuals blame someone else for a negative event and believe this other person or group should have behaved differently. Turning to the emotion of fear, AT posits that fear emerges when a situation is evaluated as posing an existential physical or psychological threat to personal well-being. In contrast to anger and fear, anxiety typically occurs when an individual experiences ambiguity or uncertainty and is motivated to prevent future harm. This means that individuals who are (1) angry should have lower Brief Resilience Scale (BRS) scores, and (2) those who are fearful or anxious will have higher ones. These predictions can be tested using CAB data.

One important issue when analysing negative emotions is their interconnectedness: a threatening event that motivates resilient behaviour is likely to involve anger, fear and anxiety resulting in the problem of how to distinguish between them. For example, Vasilopoulos, Marcus, Valentino, & Foucault (2019, pp. 686, 690) show that in the aftermath of the November 13, 2015 Paris terror attacks the emotions of fear and anger were moderately correlated ($r = 0.47 - 0.56$). Other research, inspired by AT, shows that although fear and anxiety are also linked they are nonetheless distinct emotions for two reasons. First, if a person thinks that they are more susceptible to an external threat they will exhibit more anxiety than fear. Second, if a perceived threat is viewed as being more severe this will, conversely, arouse more fear than anxiety (So, Kuang & Cho, 2016, pp. 125, 133, 135). What we have here are contextual influences (arrow 1 of Figure 1) that can be tested in CAB.

Finally, there is no reason to assume that the impact of negative emotions such as anger, fear and anxiety on individual resilience will be the same. In this respect, two hypotheses might be tested with CAB data. First, anxiety is more strongly linked with resilience than fear for problems with societal origins. This is because anxiety is a more proximate basis for adaptive (resilient) responses, than fear, in a context where the dangers are social in nature, e.g. wars, migration waves, economic downturns, crime, etc. Second, fear will be more strongly associated with resilience than anxiety when individuals are confronted with crises originating in the natural world such as pandemics and extreme weather events because fear has been an effective adaptive response for most of human history where physical dangers were experienced daily (see, So, Kuang & Cho, 2016, p. 136). These two hypotheses underscore that (a) the source of adversity matters, and that meso and macro context effects may be social or physical; and (b) the specification and testing of the MMR-CAB model must be careful in defining context effects.

Micro-Theory Foundations of the MMR-CAB: Affective Polarisation

A second foundation of our macro-micro-macro theory of multilevel resilience is the emotional basis for social and political competition and conflict. The link here with AT is that negative emotions such as anger, anxiety and fear are primed when an external crisis, typically having a social origin, is seen to be unfair. Experiencing unfairness is fundamentally emotional in nature, and is often linked to anger (Mikula, Scherer & Athenstaedt,

1998; Batson, et al. 2007; Srivastava, Espinoza & Fedorikhin, 2009). However, unfairness is also associated with anxiety 'because the incongruence between the pre-existing evaluation (i.e., pre-existing overall fairness judgment) and the actual treatment (unfair event) can create uncertainty about the future' (Barclay & Kiefer, 2019, p. 1808).

Within the MMR-CAB, it is necessary to have a precise notion of (socio-political) polarisation and how it relates, through negative emotions, to resilience. In this respect, it is important to stress that the term 'polarisation' has no definitive meaning. In part, this is due to the multilevel use of the polarisation concept. In this respect, Bakker & Lelkes (2024, p. 419) contend:

> Although scholars use the term 'polarisation' at the individual-level (John is polarised), polarisation is most properly understood as a description of the distribution of a population (America is polarised). In particular, the degree to which a population is polarised is defined as the degree to which the distribution of some measure approximates a bimodal distribution.

At the meso- and macro-levels, polarisation has two characteristics: it is both a 'state' which refers to the degree of bimodality observed, and a 'trend' revealing the extent to which a distribution is becoming bimodal. More generally, polarisation comes in a variety of flavours: elite, mass, policy, ideological, and affective. The CAB survey measures the latter 4 types of polarisation. The focus in this paper is on affective polarisation (hereafter, AP) which also has no generally accepted definition; again because of the term's multilevel use. For example, Harteveld et al. (2022, p. 5) emphasises the individual-level and states 'affective polarisation generally refers to a situation of antipathy between citizens based on their respective political identities.' In contrast, Wagner (2021, p. 3) focusses on the meso or party-level in his definition: 'affective polarisation in multiparty settings should be defined and assessed as the extent to which politics is seen as divided into two distinct camps, each of which may consist of one or more parties.' Finally, Torcal, Reiljan & Zanotti (2023, p. 1) adopted a multilevel perspective that is both individual and party based: 'affective polarization can be defined as the simultaneous presence of affinity toward one's own party and fellow partisans (in group) and hostility toward opposite political parties or compatriots with opposing political identities [out group(s)].'

The perspective adopted here will be the latter one, i.e. multilevel, where AP is operationalised at the individual-level: a perspective that matches with the macro-micro-macro theory of the MMR-CAB presented above. At the micro-level, the expectation is that AP is correlated with social avoidance, political intolerance, and support for violence against fellow citizens. All of these correlates are measured in CAB, and provide a basis for testing social interaction effects (depicted by arrow 2 in Figure 1). Specifically, it is hypothesised that there will be a positive relationship between AP, measured using an 11-point dislike-like scale of voters of competitor parties, and (a) avoidance of rival party supporters, (b) intolerance of supporters of disliked political or policy goals, and (c) support of violence to achieve political goals. One view of this relationship is that AP 'causes' the 3 democratic norm-breaking factors of avoidance, intolerance and violence. At the meso- and macro-levels, AP is linked with an unwillingness to engage in compromise in national (elite) politics, lower support for democratic norms, dissatisfaction with de-

mocracy, and lower levels of political engagement (Brentzen, Kelsall & Harteveld, 2024, pp. 929–931).

From a multilevel perspective, AP is considered important because the prevalence of strong negative emotions such as fear, anger and anxiety at the micro-level is suspected to have undesirable meso- and macro-level consequences such as (1) lowering electoral accountability, (2) promoting blind conforming to group norms, (3) reducing citizen support for democratic norms, and (4) increasing support for violence (Iyengar et al., 2019). These consequences emerge from inter-individual interaction effects generated by various social interaction mechanisms represented by arrow 2 in Figure 1. All of this leads at the macro-level to a destabilising of the democratic system operating through social aggregation processes linking the micro- to macro-levels as shown in arrow 3 of Figure 1. It is important here to highlight that the link between AP and anti-democratic attitudes relationship is not direct, but moderated by the presence of anger, anxiety and fear because these emotions are known to be associated with biased information processing (Bakker & Lelkes, 2024, pp. 424–425). Such moderation effects are a central feature of multilevel statistical models discussed below.

To date, the relationship between political polarisation and resilience has been mainly conceptualised at the macro-level within the research literature. Specifically, countries with higher levels of polarisation have lower 'democratic resilience' which has been defined as 'the capacity of an entity or system to resist to shocks, to absorb them, to bounce back from them and to move forward, in order to maintain or enhance its identity, if not structures and functions' (Croissant & Lot 2024, p. 5). This definition is almost identical with individual-level definitions of resilience (see, next section). In short, there is a theoretical homology concerning the concept of resilience at the micro-, meso- and macro-levels. The key point here is that the macro-level idea of democratic resilience has been posited as a solution to pernicious political polarisation at the meso- and micro-levels (see, McCoy & Sumer 2021, pp. 61–92). Theoretically, what this means is that factors, such as institutional constraints, that promote democratic resilience at the state level operating through contextual influences (arrow 1 in Figure 1) can attenuate AP at the individual-level. This can occur by lowering individuals' feelings of anger, anxiety and fear. Having discussed (democratic) resilience at the macro-level, it is important now to re-direct attention to the micro-level; and explain how personal resilience is conceptualised and measured in the MMR-CAB.

Operational Definition of Personal Resilience

The development of the MMR-CAB requires: (1) a definition of resilience and (2) a concrete method of measurement. The Brief Resilience Scale (BRS) was developed to measure individual self-reports of ability to recover from stress using a 5-point Likert scale. Resilience is defined as '[…] the ability to bounce back, resist illness, adapt to stress, or thrive in the face of adversity […]' (Smith et al. 2008, p. 195). Consequently, the BRS measures personal confidence in ability to deal with challenges, and is an indicator of psychological resilience operationalised as 'bouncing back'. Please note that BRS does not

aim to measure adaptation or resistance which are other frequently mentioned attributes of resilience.

The BRS is a summated rating scale that is a unidimensional measure of individual resilience; it includes both positively and negatively worded items to enhance validity and reliability. The following instructions are used to administer the scale: 'Please indicate the extent to which you agree with each of the following statements by using the following scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree.'

1. I tend to bounce back quickly after hard times.
2. I have a hard time making it through stressful events. (R)
3. It does not take me long to recover from a stressful event.
4. It is hard for me to snap back when something bad happens. (R)
5. I usually come through difficult times with little trouble.
6. I tend to take a long time to get over setbacks in my life. (R)

A validation study of a Czech (and Slovak) version of BRS revealed that the scale has 'good psychometric properties' in terms of validity and reliability (Furstova, Kascakova, Polackova Solcova, Hasto & Tavel, 2021, p. 2810). The protocol for using the BRS has a 4 step procedure. First, items 2, 4, and 6 of the BRS are scored by reverse coding (R) them; the mean of the 6 Likert items is then estimated. Mean BRS scores are recommended for comparison with previous research. Second, a total score is calculated by taking the sum or the mean of the scores on the six items resulting in a score from 6 to 30 for sums and from 1 to 5 for means. Third, missing data are mean imputed (from step 1) using information from the non-missing BRS scale items. Fourth, the BRS may be interpreted using a summated rating scale ranging from (1) very low to (7) very high: this

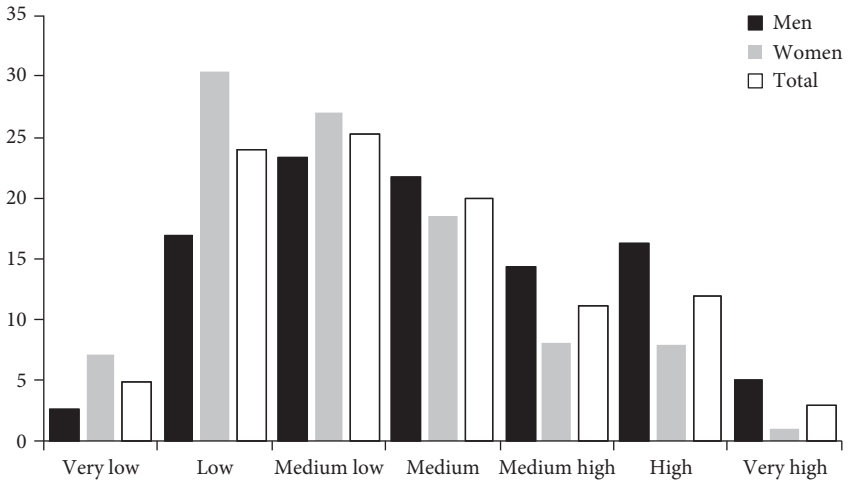

Figure 2: Brief resilience scale profile for Czech adults, June–July 2024 (percent)
Source: CAB wave 1, n = 1748, data unweighted

allows comparison with other national studies thereby establishing if Czechs are more or less resilient than citizens elsewhere.

By way of introducing the resilience data measured in CAB, Figure 2 shows the current Czech profile of resilience. Similar to other studies, the BRS has a roughly normal (Gaussian) distribution with some negative skew where slightly more scores were lower than the mean. This hints at a specific gendered survey response effect where women tend to self-report having lower levels of resilience than would be expected if resilience were normally distributed across the population. Statistically, this effect size is not small ($p \leq .001$, $d = .49$ [CI .40 – .59]). This gender difference matches with previous research both in the Czech Republic and elsewhere (Furtova et al. 2021, p. 2822). However, this gender difference is not observed in all resilience scale (see below for details) highlighting that how resilience is measured matters and has normative implications. The BRS scale implemented in CAB has, in statistical terms, high reliability (Cronbach's alpha = .87, McDonald's omega = .87). Moreover, the assumption that the BRS scale measures a single thing, i.e. resilience, is confirmed by additional data analysis. Since the BRS responses in CAB appear to refer to a single latent trait, then other statistical techniques making different assumptions about the individual scale items may also be used to broaden understanding of individual resilience, e.g. item response theory (IRT).

Operationalising the MMR-CAB

A central motivation for developing the MMR-CAB is that the nature and definition of resilience depends on level of analysis (see, Kimhi, Marciano, Eshel & Adini, 2022). Here, 3 facets of resilience will be used to construct an MMR-CAB: individual, community and societal. One key consequence of the micro-macro-micro theory of MMR-CAB, outlined above, is that measurements of resilience at the micro-, meso- and macro-levels need not be strongly linked because (a) they refer to qualitatively different forms of resilience and (b) there is no a priori reason to expect that resilience at the meso- and macro-levels are simple aggregations of patterns observed at the individual-level. Note here, the ecological inference problem and the insight from appraisal theory that any aggregated unit, such as a community (okres), could exhibit a level of resilience and emotions such as anger and anxiety resulting from a large number of individual-level patterns that yield a common result. Therefore, levels of resilience observed at the meso- and macro-levels derive from an indeterminate number of potential aggregation rules from individual-level data. There is no statistical solution to this fundamental indeterminacy (Clark & Avery, 1976). What is possible is to use a multilevel statistical approach where different levels are analysed simultaneously (see below).

At the micro-level there is Individual Resilience (IR) which is defined above and is measured using BRS. Moving to the meso-level, there is Community Resilience (CR) which will be measured using the CAB survey: individual-level data may be aggregated to the community-level to create a resilience indicator for a specific geographical area (okres). It is important to highlight here that CR has many definitions and no generally accepted operationalisation (Patel, Brooke Rogers & Rubin, 2017). Nonetheless, CR may also be profitably measured using administrative and labour force survey data where the

definition of CR refers to enhancing quality of life in a community by minimising the (potential) impact of disasters such as local flooding, crime, etc. Finally, at the macro-level there is Societal Resilience (SR) which depends on socio-political performance of the national system of governance indicated by (a) satisfaction with the functioning of democracy, (b) legitimacy of the political regime, and (c) trust in institutions. Each of these factors is measured in CAB.

Development of an MMR-CAB also involves consideration of what factors change IR, CR and SR within the logic presented in the macro-micro-macro theory above. The key dynamics here are (1) cross-level interactions (arrows 1 and 3 of Figure 1), and (2) inter-individual interactions occurring over time (arrow 2). CAB is designed to measure both of these dynamics in conjunction with selected auxiliary (external) evidence such as administrative data. The three main objectives of the MMR-CAB are (a) construction, estimation and comparison of IR, CR and SR scales; (b) comparison of IR, CR and SR scores for over time; and (c) explaining differences in IR, CR and SR in terms of issue and affective polarisation and three key negative emotions: anger, fear and anxiety, discussed in the micro-theory section above. Finally, to reiterate a point made earlier, the normative implications of using specific resilience indicators is something that will inform all empirical work.

MMR-CAB Data Usage and Analysis

CAB has been designed to measure resilience biannually between 2024 and 2027 in a 7-wave panel survey. The MMR-CAB is flexible as the hierarchy in units of analysis may be (re)defined as required. A first use of MMR-CAB is to examine how inter-individual variation in resilience, as measured using BRS (see above), are associated with attitudes relating to policy preferences, affective polarisation, and socio-economic background. This facilitates exploring individual resilience (IR) in a comprehensive way. A second use of MMR-CAB is to take the community (okres, n = 77) as the primary unit of analysis and study how community resilience (CR) varies across the Czech Republic using CAB data to estimate resilience in each community and match BRS community scores with a wide range of quality of life indicators assembled by the Czech Statistical Office (CZU). Also, the quarterly Czech Labour Force Sample Survey (Výběrové šetření pracovních sil (VŠPS)) is also an important resource for community (okres) data. These CZU data facilitate study of CR in a way that allows moving beyond reliance on self-reported survey data. A third use of MMR-CAB is to aggregate the CAB data to the community level and track the trajectory of CR across time in terms of affective, socio-political, and socio-demographic factors. Finally, it is also possible to examine SR and assess if Czech society is becoming more or less resilient over time (2024–2027) and make comparison with other countries (e.g. Koubová & Kimhi, 2024).

MMR-CAB data analysis: Statistical evaluation of MMR-CAB could proceed in two steps. First, estimation of resilience scales at the individual, community, and societal levels. With BRS this involves a summated rating scale; however, this may be generalised using structural equation modelling (SEM) where the IR, CR and SR scales are examined in an integrated model using a Bayesian SEM due to its greater flexibility than maximum

likelihood estimation (Muthén & Asparouhov, 2012). Second, estimation of multilevel regression models of IR, CR and SR using explanatory variables such as polarisation, anger, anxiety at the individual-level; living standard indicators for the community-level derived from administrative data; and national measures such as unemployment, inflation, etc. for the societal-level.

The conceptualisation underpinning statistical multilevel modelling is not unified for historical reasons; so the theory and interpretation of multilevel models varies. The first, older perspective, involves establishing the same (homologous) relationship between polarisation and resilience, for example, across the individual, community and societal levels, thereby conducting a 'within and between analysis' (WABA). A second, more recent view, focusses on the impact of higher levels on lower levels, e.g. establishing how degree of political polarisation at the community level influences individual resilience (IR) using a 'random coefficient model' (RCM). These two multilevel statistical modelling perspectives are complementary in 'answering different questions and addressing different issues' (Yammarino & Gooty, 2019, p. 563). Consequently, it makes sense to integrate both perspectives into a single integrative model which will be presented here in a preliminary and intuitive way. Here it is important to note that the individual, group or community, and collective or societal levels could be examined using both WABA and RCM. In the resulting integrative model there would be (a) direct cross-level effects for variables that are both a cause and effect, (b) intra-level and cross-level effects for key covariates, and (c) cross-level moderating effects due to exogenous factors such as the wealth of a community.

Within the macro-micro-macro theory, presented above, it is envisaged that the focus of the integrative model will be on the second (RCM) perspective as the key dependent variable in MMR is individual-level. However, there is also interest here in CR, for public policy reasons; so the WABA perspective will be important in pursuing a broader exploration of MMR. The admittedly tentative integrative model proposed here is important because it demonstrates how the contextual influences (arrow 1) of Figure 1 could be tested statistically where community resilience, for example, moderates both individual resilience and polarisation. Clearly, the modelling possibilities presented here represent a beginning, opening pathways to partial analyses that are beyond the scope of this article. For this reason, the full scope of what is possible must be postponed for future publications.

Extending previous data analyses: A recent example of testing a multilevel model of resilience within Czech society employed a cross-section survey methodology that measured resilience concepts at the individual (IR), community (CR), and societal (SR) levels using individual-level self-reports to online survey questions (Koubová & Kimhi, 2024). The measurement of IR in this study did not use the BRS with six items, but two items from an alternative called the Connor-Davidson resilience scale (CD-RISC; Connor & Davidson, 2003). While BRS aims to directly measure an individual's ability to 'bounce back', the CD-RISC measures different resources an individual can call on to deal effectively with stressful events. Originally, the latter scale was used to help diagnose post-traumatic stress disorder. Both BRS and CD-RISC are 'highly correlated but still distinct' (i.e. $r = +.81$, $p \leq .001$; Ye, Wu, Huang & Yang, 2022). In essence, the BRS is primarily unidimensional in conception and individualistic in operationalisation; while

the 25 item CD-RISC works with a multidimensional theory of resilience that has five factors labelled 'personal competence', 'trust in instincts', 'positive acceptance', 'control' and 'spiritual influence'.

Measuring different facets of IR has some important consequences. For example, cross-national implementations of BRS consistently show a gender effect with BRS (as highlighted earlier in Figure 2), but this dissimilarity is not evident in CD-RISC data. Why? One reason for this BRS vs. CD-RISC difference is measurement: women score better on resilience scales that are more sociotropic rather than egocentric in orientation. This interpretation matches with the results of a meta-analysis of gender differences in sociotropy (Yang & Girgus, 2019); and highlights a point made above that 'the methods by which it [resilience] is measured, and the uses made of the indicators thereby generated, are all normative' (Copeland et al., 2020, p. 8). More work will be done on this topic in future research.

Koubová & Kimhi's (2024) comparative study of multilevel resilience in the Czech Republic, Slovakia and Israel following the Russian invasion of Ukraine in February 2022 reported that Israel, overall, had the highest resilience. In this respect, this comparative study emphasised the importance of culture explaining comparative difference in observed resilience at the individual, community and societal levels (Koubová & Kimhi, 2024, pp. 2, 7, 9; note also Troy et al. 2023, pp. 565, 567). Here the focus will be on the Czech results. Using path analysis, this study found that sense of danger was the best predictor of IR, and education was also an importance correlate; the strongest predictor of CR was community morale; and the key predictor of SR was the emotion of hope where macro-level resilience was strongest among women. Importantly, the correlates of IR, CR and SR were not always the same in Koubová & Kimhi's (2024) study. This fact undermines a homologous conception of resilience, where resilience is operationalised with the same variables at all levels of analysis. Specifically, the emotions of hope and feeling threatened were linked with resilience at all levels, but age and family income were not strongly associated with resilience at any level. In contrast, anxiety and sense of danger were only associated with IR and SR; while feeling threatened is correlated with CR and SR. For some specific factors there are also mixed effects. For example, Koubová & Kimhi (2024, p. 6) found that religiosity has a positive association with CR and a negative one with IR. Why this is the case is not explained, and suggests another future line of research with CAB.

Although all of these results are intrinsically interesting, and represent an important starting point for analysing the CAB panel data; the Koubová & Kimhi (2024) study is primarily empirical and is not based on an integrated multilevel framework that facilitates understanding the common and contrasting results at the different levels of analysis. To fill this lacuna in the literature, a key goal of the MMR-CAB, as presented in this paper, has been to develop such a theory and propose how it might be tested over the next three years.

Conclusion

The purpose of this paper has been to present some details for the conception and operationalisation of resilience in formulating the MMR-CAB. In this article, we described the outline of a MMR-CAB that is based on a theoretical position compatible with methodological individualism as a prerequisite for testability in a longitudinal panel empirical investigation on a concrete (Czech) population. The MMR-CAB presented in this paper aims to understand how individuals adapt to adversity where the primary unit of analysis is the person. However, the discussion has emphasised that individuals exist within communities and a society where a specific (Czech) cultural context shapes how individuals perceive and experience adversity and resilience (Troy et al., 2023; Koubová & Kimhi, 2024). Therefore, the proposed outline of the MMR-CAB exists within a theoretical and data testing framework that explores the interaction between the individual, community, and societal levels of analysis.

A natural question in presenting the MMR-CAB is how to integrate the IR, CR and SR estimates into an 'overall resilience' score? This is both a conceptual and measurement question because it presumes the existence of something called 'overall resilience' in addition to IR, CR and SR and positing some relationship between these four forms of resilience. Using a latent variable perspective there are five potential answers to this question. These answers refer to a set of possible data measurement models: (1) a unidimensional model where all indicators are determined by overall resilience latent variable suggesting a multilevel conception of resilience is unnecessary; (2) an uncorrelated factors model in which IR, CR and SR are independent and there is no overall resilience; (3) a correlated factors model with no overall resilience where IR, CR and SR are independent but have some associations; (4) a bifactor model where each indicator of resilience is caused by overall resilience; however, IR, CR and SR also exist, based on subsets of indicators, and they have low to no association with overall resilience or each other; and (5) a higher-order model where overall resilience causes IR, CR and SR who have low or no association (see, Dunn & McCray, 2020, pp. 4–8). Some recent work on Czech resilience treated IR, CR and SR as being uncorrelated, but did report they have some association (Koubová & Kimhi, 2024, p. 5, table 3, estimates ranged from 0.16 to 0.42). More work is required in the development of MMR-CAB to answer the question posed above.

An important limit of this paper is the lack of sociological and cultural insights on resilience. Sociologically speaking, the theories of social capital associated with Bourdieu (1986, pp. 248–252) and Coleman (1990, pp. 300–321) reveal that IR is dependent on attitudes, beliefs, values, norms, networks and institutions. With regard to effective adaptation to stress and crises, i.e. resilience, Bourdieu prioritised the size of individuals' social networks (defined mainly as group membership in the 1980s) in maintaining and reproducing social status and wealth, i.e. the social structure. Thus, at the risk of over-simplification, with more wealth, there is more social capital, and hence more resilience. In contrast, Coleman stressed that social capital is an inherent communicative and transactional part of social structure that depends critically on mutual dependency. Consequently, increased wealth decreases mutual dependency, social capital and hence resilience. Moving beyond the individual-level, Putnam's (2000, pp. 48–64) study of communities' shows that both social capital and CR depend critically on level of participation

in local voluntary associations. In sum, resilience, like social capital, is both an individual asset and a collective resource. Future work will develop this insight using a sociological approach to resilience that is amenable to testing the MMR-CAB. Turning now to culture, it is clear that a particular Czech form of resilience is likely to exist and this should be studied in CAB. For example, do styles of thinking linked with self-deprecation, negativity, and value centrism which originate in culture and history help explain variation in IR, CR and SR? In attempting to answer this question, insights might be gleaned from Holý's (1996, pp. 88–89, 114) interpretive study of Czech identity circa 1990. This work was inherently multilevel in its analysis of cross-level (individual versus society) contradictions in the Czech sense of identity. For example, the public perception is that Czech society is highly cultured and deeply democratic while individual Czechs exhibit envy and intolerance. What emerges is a self-image of 'the little Czech' being resilient despite repeated societal crises in the 'great Czech nation'. Consequently, a key lesson from Holý's work for the MMR-CAB is that the determinants of Czech subjective resilience are likely to be both multilevel and paradoxical in nature.

A central task in developing the MMR-CAB is to study the relationship between resilience and polarisation in terms of three key emotions: anger, anxiety and fear. These emotions stemming from adversity posit contrasting motivations for polarisation and resilience that depend critically on the culturally determined spatial and temporal context. Finally, the operationalisation of resilience using specific indicators and scales, e.g. BRS, represents a commitment to a particular theory of resilience (unidimensional and egocentric) that has fundamental implications for understanding the use and utility of the MMR-CAB.

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