Modeling Contingency in Veteran Community Reintegration: A Mixed Methods Approach

Nicholas A. Rattray[1,2,3] , **Edward J. Miech**[1,2,3] , **Gala True**[4,5],
Diana Natividad[1], **Brian Laws**[1], **Richard M. Frankel**[1,2,3], and
Marina Kukla[1,6]

Abstract
Researchers need approaches for analyzing complex phenomena when assessing contingency relationships where specific conditions explain an outcome only when combined with other conditions. Using a mixed methods design, we paired configurational methods and qualitative thematic analysis to model contingency in veteran community reintegration outcomes, identifying combinations of conditions that led to success or lack of success in community reintegration among US military veterans. This pairing allowed for modeling contingency at a detailed level beyond the capabilities of either approach alone. Our analysis revealed multiple contingent relationships at work in explaining reintegration, including social support, purpose, cultural adjustment, and military separation experiences. This study contributes to the field of mixed methods by pairing a mathematical cross-case method with a qualitative method to model contingency.

Keywords
contingency, configurational comparative methods, military veterans, coincidence analysis, mixed methods research

Introduction

As greater attention has been given to synergies that emerge from mixing and synthesizing research data collected with diverse techniques, mixed method researchers have sought new

[1]Roudebush VA Medical Center, Center for Health Information and Communication (CHIC), Indianapolis, IN, USA
[2]Department of Internal Medicine, Indiana University School of Medicine, Indianapolis, IN, USA
[3]Regenstrief Institute, Inc, Indianapolis, IN, USA
[4]South Central MIRECC Southeast Louisiana Veterans Health Care System, New Orleans, LA, USA
[5]Section of Community and Population Medicine, Louisiana State University School of Medicine, New Orleans, LA, USA
[6]IUPUI Department of Psychology, Indianapolis, IN, USA

Corresponding Author:
Nicholas A. Rattray, Roudebush VA Medical Center, Center for Health Information and Communication (CHIC), 1481 W. 10th Street, Indianapolis, IN 46202 USA.
Email: nrattray@iupui.edu

approaches that allow for novel insights that would be less likely to emerge from a narrower focus (Fetters et al., 2013; Fetters & Freshwater, 2015). Within applied fields such as the health sciences, qualitatively oriented mixed methods studies demonstrate considerable variation in their philosophical underpinning and analytical techniques. Studies described as quantitative most frequently draw on traditional regression models that focus on relationships between variables and quantify probabilistic or net effects. Configurational Comparative Methods (CCMs) represent a relatively new mathematical approach in health sciences that identify sets of conditions that are jointly sufficient to produce an outcome (Cragun et al., 2016; Palinkas et al., 2019; Whitaker et al., 2020). Configurational Comparative Methods draw on regularity theories of causation to model how a condition may have a difference-making effect on an outcome (Baumgartner, 2008).

In this mixed method study, we paired configurational methods with qualitative thematic analysis in order to model contingency (Sarkies et al., 2020), where specific conditions—when combined with certain other specific conditions—explained community reintegration outcomes of interest following military service. We used a configurational approach to identify conditions directly linked to outcomes (including possible contingent relationships), then returned to the cases with these configurational models in hand to conduct qualitative thematic analysis within cases in order to "unpack" these solutions in context. This convergent mixed methods approach offered a nuanced understanding of how military veterans transition into the communities to which they return, yielding insights into contingency with potential applications to other multi-level, complex health issues.

We demonstrate how combining CCMs with qualitative thematic analysis represents a novel approach to modeling contingency. In a previous empirical study (Rattray et al., 2019), we identified broad patterns among veterans who were more successful in navigating reintegration compared with others, but here seek a more nuanced understanding of which specific conditions—and combinations of conditions—contributed to successful community reintegration. The present study applied coincidence analysis in particular to determine which conditions led to successful community reintegration (Ambuhl & Baumgartner, 2018; Basurto & Speer, 2012; Baumgartner & Epple, 2014; Baumgartner & Thiem, 2015; de Block & Vis, 2019).

Community Reintegration of Veterans

Some of my friends leaving the military were able to just jump right into school and find their niche and go—I was able to get it together and go to school and see how frustrating that was for them to feel like they're some sort of failure for not being able to get it done yet. Everybody else did, why can't they?

The rehabilitation and health care issues of US military veterans who have served in conflicts in Iraq and Afghanistan have led to increased awareness of the challenges of community reintegration. Surveys of post-9/11 veterans have demonstrated that service members with post-traumatic stress have more difficulties than those who do not (Sayer et al., 2015). For example, veterans returning to civilian life may have unique difficulties in resuming family roles or participating in community life. These challenges stem in part from leaving environments where they typically felt a strong sense of belonging and purpose (Castro & Kintzle, 2014; Sayer et al., 2010). Barriers have been documented for Veterans with "invisible injuries," including traumatic brain injuries and mental health conditions (Hoge et al., 2006, 2008; Seal et al., 2007; Tanielian & Jaycox, 2008).

Less attention has been placed on the subjective aspects of reintegration challenges, specifically in domains including interpersonal relationships with friends and family, academic or work productivity, community participation, self-care, recreation, and perceived meaning in life

(Crocker et al., 2014). Research suggests that despite increased awareness about the prevalence of post-traumatic stress disorder (PTSD), cognitive injuries, and other mental health symptoms among this veteran cohort, the long-term effects and cost of these conditions are still poorly understood compared to injuries or more visible physical conditions. Recent studies have endorsed a broader conceptualization of adjustment (Adler et al., 2011) that includes health issues and also attends to housing, identity, family, and employment issues (Dichter & True, 2015; Elnitsky et al., 2017; Kukla et al., 2015). Studies have suggested that reluctance to disclose information about injuries can hinder reintegration (Jeffreys et al., 2010), especially in the early phase of transition when addressing latent mental health conditions is paramount (Sokol et al., 2021; Vogt et al., 2020). Social support has been shown to be a facilitator of readjustment and contribute to resilience (Cunningham et al., 2014; Yazicioğlu et al., 2006). However, recent longitudinal studies have suggested that reintegration may fluctuate over time and may even worsen over longer periods (Eekhout et al., 2016; Vasterling et al., 2016; Wilcox et al., 2015).

Despite widespread acknowledgement of the importance of supporting reintegration, there is little evidence about what specific conditions (and combinations of conditions) differentiate veterans who achieve stability following their service from those who have less success. The epigraph above illustrates this tension: why do some veterans manage to "get it together" while others feel like a "failure?" What is missing in recent literature on veteran reintegration are ways to identify and understand the *combinations* of conditions that lead to divergent outcomes.

Configurational approaches provide case-based methods for identifying causal inference (Rohlfing & Zuber, 2021). Ragin (Ragin, 2008, 2014; Rihoux & Ragin, 2009) combined the logic of Boolean algebra and set-theoretic principles to develop Qualitative Comparative Analysis, the most widely known approach within configurational analysis. Qualitative Comparative Analysis can be applied in studies with small or medium sample sizes and shares commonalities with the constant comparative method (Glaser, 1965) from grounded theory in its iterative, detailed approach to individual cases (Palinkas et al., 2019). Coincidence analysis is a more recent member within the larger CCMs family (Baumgartner, 2013a). Rather than rely on the original Quine-McCluskey algorithm used in most qualitative comparative analysis, coincidence analysis uses an alternative, bottom-up algorithm custom-designed for application within social-sciences research to identify difference-making conditions that consistently distinguish cases with the outcome of interest from those without (Ambuhl & Baumgartner, 2018; Baumgartner, 2013b; Baumgartner & Ambühl, 2018; Baumgartner & Epple, 2014).

In fields where outcomes are important, such as health services or education, configurational approaches offer techniques for identifying contingency, where conjuncts of interconnected conditions lead to outcomes of interest (Cragun et al., 2016; Yakovchenko et al., 2020). Configurational Comparative Methods also allow for equifinality, where more than one pathway leads to the same outcome, as well as and asymmetrical solutions, where pathways vary for positive and negative outcomes.

Pairing configurational methods with qualitative thematic analysis provides a novel way to understand the complex phenomenon of community reintegration by expressly including the capacity to identify contingent relationships (Thiem, 2013). Configurational analysis allows for systematic cross-case analysis of a set of constructs scored on a 5-point scale ranging from +2 to −2. Qualitative thematic analysis—a method used to examine patterns in non-numerical data (Bernard, 2011; Boyatzis, 1998)—then allowed us to explore those models both in context and in depth by returning to the rich, detailed qualitative data available in the original interview transcripts. In qualitative thematic analysis, analysts gain a holistic understanding of a dataset by studying cross-cutting themes across cases but always in relation to the broader material. The objective is to understand phenomena by interpreting meanings as close as possible to how study

participants experience them while accounting for potential bias of the researchers (Corbin & Strauss, 2008).

Methods

Research Design

This secondary analysis examined data collected in a mixed methods study of community re-integration among US military veterans pursuing post-secondary education who were diagnosed with an "invisible injury" (Rattray et al., 2019). We used a convergent study design by simultaneously collecting qualitative and quantitative data with separate analyses (Bazeley, 1999; Creswell & Plano Clark, 2018). We used qualitative thematic analysis (Boyatzis, 1998) to identify cross-cutting categories about participants' experiences of community reintegration and paired those findings with configurational analysis (Baumgartner & Ambühl, 2020) to explain veteran community reintegration outcomes. The study design is described in Figure 1.

Research Setting, Sample Recruitment, and Data Collection

Participants were recruited from three outpatient clinics (i.e., post-deployment integrated health clinic, women's health clinic, and primary mental health clinic) at a tertiary Veterans Affairs medical center in an urban Midwestern city in the United States. Participants were eligible for the study if they had a documented invisible injury, defined by a diagnosis in the patient medical record of at least one of the following: a cognitive disorder, including traumatic brain injury or a mental health disorder, including PTSD, traumatic brain injury, mood disorder, or anxiety disorder. Enrollment in post-secondary coursework within the last 60 months was an inclusion criterion.

Frontline clinicians informed potentially eligible veterans about the study and provided them with study information sheets. Veterans received mailed letters describing the study and then were called by our study team to confirm eligibility and schedule a meeting. Thirty-eight participants provided informed consent and completed interviews. Participants met once in-person with either the first author (a research scientist/PhD anthropologist with a background studying veteran reintegration issues) or a research assistant trained in qualitative data collection for an interview that lasted 30–90 minutes. The first author conducted 27 of the interviews. The study protocol was approved by the medical center and university Institutional Review Boards.

In addition to an interview, a questionnaire was completed on demographic characteristics including gender identity, ethnicity, age, marital status, disability status, benefit status, residential status, current employment status, income level, year of separation from military service, educational attainment, and universities, colleges, or trade schools attended. Chart review of electronic health record data was utilized to confirm questionnaire responses concerning deployment, health conditions, and combat status. Combat experience was verified through self-report. Community reintegration was measured in the parent study using the Military to Civilian questionnaire (M2C-Q), a brief, self-reported scale intended to measure different dimensions of community reintegration. The 16-item questionnaire asked about social relations; productivity (in education, work, and domestic life); community engagement; and perceived meaning in life, self-care, and leisure. Participants responded using a 5-point scale, with higher scores indicating worse reintegration (0 = Doesn't play a role, 1 = Plays a slight role, 2 = Plays a moderate role, 3 = Plays a large role, 4 = Plays a very large role). The M2C-Q has good internal consistency ($\alpha = 0.87$) and was specifically constructed for use with US military veterans. Of note, the instrument was designed to ask respondents to reflect on reintegration difficulties over the last 30 days.
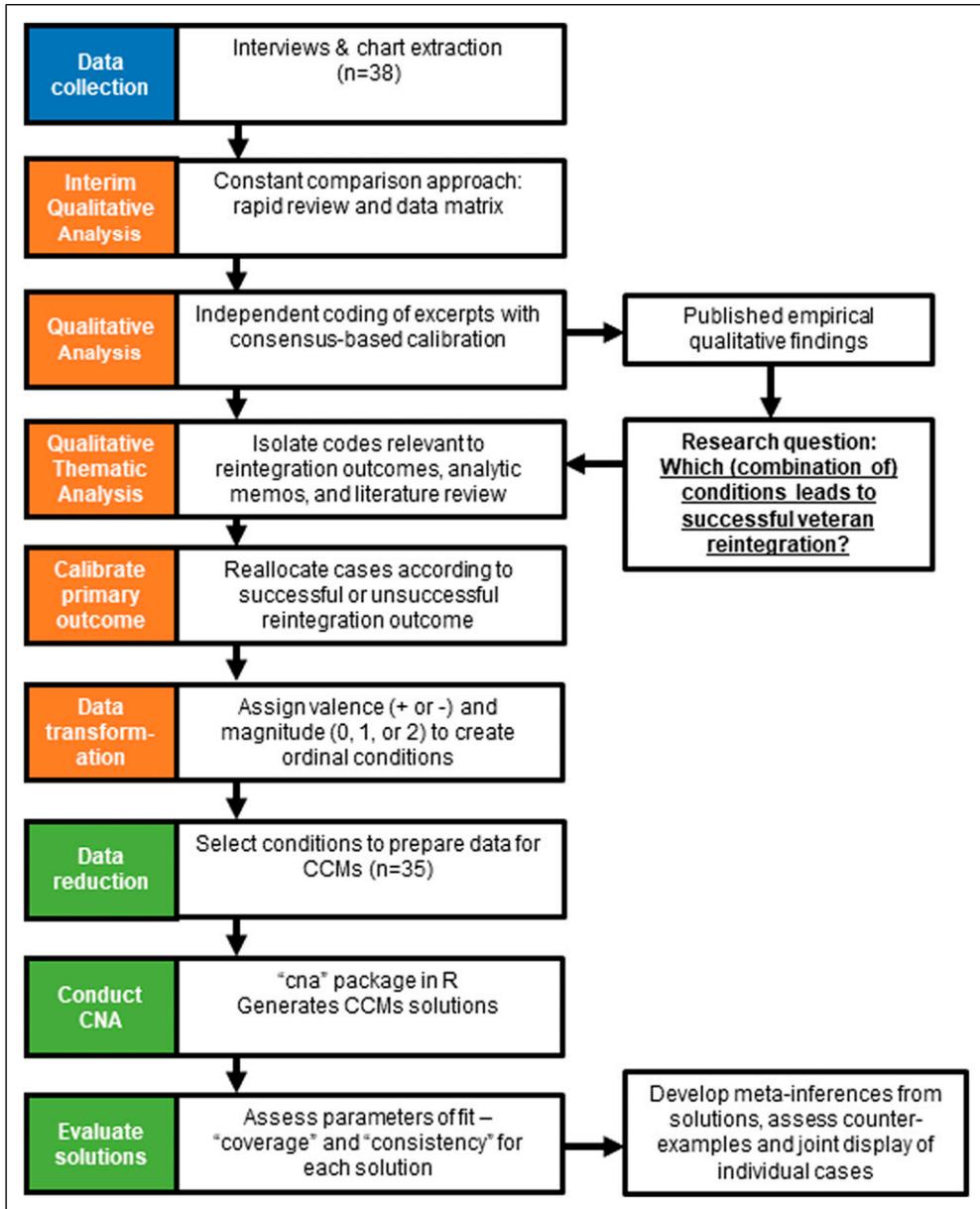
Figure 1. Study design and analysis approach.

Qualitative data were collected through a semi-structured interview guide that was organized around a "grand tour" question to establish rapport and encourage detailed, personal responses. Participants were asked to describe their experiences with post-secondary education, how they define success, barriers and facilitators to integrating into university environments, and key transitional experiences spanning deployment to separation from military service and reintegration into civilian life.

Data Analysis

The mixed method framework for merging data can be characterized as an "exploratory bidirectional approach," where interview findings drove the analysis, and configurational methods were used to interpret categories derived from quantitative results and individual cases (Moseholm & Fetters, 2017). Questionnaire data were verified for accuracy and inputted into SPSS for descriptive analyses. Interview data were de-identified and reviewed; NVivo software was used to manage transcripts and capture analytic memos. A constant comparison approach based on grounded theory was used to develop the themes (Glaser, 1965). The analysis team included one member who was blinded to the grounded theory original analysis and who was also a military veteran; the other three analysts were involved in both the original study and the CCMs analysis.

Open coding of the 38 interview transcripts and field notes led to the development of a codebook consisting of 17 themes. In the first step, three coders independently read interview transcripts using a case comparison worksheet to summarize key points, discuss disagreements, and track data saturation (e.g., the point at which no new thematic categories emerged from the data). Analytic memos were regularly composed to reflect and connect emergent content related to community reintegration (Saldaña, 2012). In the second step, case summaries were compared using a data matrix with discrepancies resolved by consensus. The data matrix and open coding process in the first stage led to the development of a codebook that was refined until a shared understanding on code definition and unitization was achieved among team members that emphasized coder consistency (Hammler et al., 2020; Saldaña, 2012). The third step involved independent coding of the transcripts by two team members. The coders for each transcript met in person to review the double coded transcripts and resolve discrepancies through consensus, which were supplemented by team calibration meetings after every 5 transcripts. From an original set of code categories, a selected set was used as potential conditions for the CCMs analysis.

Conditions and Primary Outcomes in Configurational Analysis

From the 17 codes in the qualitative thematic analysis, the team evaluated each for theoretical importance and relevance to the narrower focus on reintegration outcomes, which led to the inclusion of 9 themes (see Appendix 1). A subsequent round of analysis was carried out where nine codes were scored for each of the 38 cases. The team drew on the coded transcripts and the cross-case analysis template to develop criteria for scoring selected codes for each individual case. Scores ranged from +2 to −2 and designated the type of impact and its influence (+2 = strong positive, +1 = weak positive, 0 = neutral, −1 = weak negative, −2 = strong negative) where negative scores indicated detrimental to reintegration success and positive scores indicated facilitation of reintegration success. Assignment of scores for each case was consistent with an "anchored calibration" approach (Legewie, 2017). For each case, ordinal scores were assigned to indicate membership in the abstract categories that resulted from the qualitative thematic analysis. Direct quotations were used as data anchors to sort membership scores and resolve ambiguities within specific cases. Relevant literature was used to determine the role of these conditions in influencing reintegration, with a particular focus on issues of disclosure (Jeffreys et al., 2010), social support (Cunningham et al., 2014; Yazicioğlu et al., 2006), early readjustment (Elnitsky et al., 2017; Sokol et al., 2021), and life purpose (Castro & Kintzle, 2014; Sayer et al., 2010). Appendix 1 describes each condition, references a key study, defines the criteria for ordinal scores, and offers verbatim quotations that demonstrate exemplar evidence for strong negative and strong positive influences. The subject expert analyst (veteran), who was blinded to the original analysis and primary outcomes, collaborated in the process of defining criteria and in resolving ambiguous

scores. Appendix 2 presents a list of each of the cases with the primary outcome and scored ordinal values for each condition.

The primary outcome used in the multi-value CCMs analysis was based on self-reported M2C-Q scores. The overall mean score was 1.97 (SD = 0.80), with 58% of participants having a score of 2 or higher (2 = "some difficulty"; 3 = "a lot of difficulty"; 4 = "extreme difficulty"). In terms of specifying the outcomes of interest, the research team compared scores from the self-reported M2C-Q with analytic memos about each case in order to normalize values for community reintegration. As a result, all cases were assigned a new value for reintegration that differed in some cases from self-reported M2C-Q scores. For the purposes of the CCMs analysis, we chose to combine reintegration scores of "3" (moderate) or "4" (high) to represent cases where successful community reintegration was achieved. Aligning with standard practice in configurational analysis, cases with any missing values were dropped from the configurational analysis.

These data were analyzed using the R package "cna" for multi-value configurational analysis (Ambuhl & Baumgartner, 2018). Using a configurational approach to condition selection described in detail elsewhere (Yakovchenko et al., 2020), we first applied the "minimally sufficient conditions" function within the R "cna" package to scan the entire dataset and identify configurations with the strongest connections to the outcome of interest (Hickman et al., 2020; Miech et al., 2021; Petrik et al., 2020;). Analyses for the presence of the outcome and the absence of the outcome were conducted separately. This process exhaustively considers all one-, two- and three-condition configurations instantiated in the dataset, assesses each configuration against a pre-specified consistency threshold, retains all configurations that satisfy this criteria, and then generates a "condition table" to list and organize the Boolean output. Using this approach, we inductively analyzed the entire dataset and used the Boolean output in the condition table to identify a subset of candidate condition most likely to inform model development in the next steps of configurational analysis. (see Appendix 2) Two parameters of fit were used to evaluate the quality and merit of configurational models: consistency and coverage. *Consistency* is the percentage of all cases with the outcome and covered by the model compared to all cases covered by the model. *Coverage* is the percentage of all cases with the outcome and covered by the model compared to all cases with the outcome.

Taken together, the data merging analytics were qualitatively driven, iterative, and bidirectional (Moseholm & Fetters, 2017). The qualitative interviews were approached from a post-positivist epistemology, supplemented by numerical data. Iteration occurred in the normalization of cases for reintegration outcomes and during the ordinal scoring of major qualitative themes. Lastly, we took a bidirectional approach in returning to the individual cases to assess and interpret the results of the overall CCM solution. Counter-factual cases were examined to understand where veterans had positive outcomes outside of the solution pathways as well as cases where configurations matched a positive pathway but the outcome was negative.

Results

Sample Characteristics

Table 1 compares gender, age, mental health condition, TBI status, combat experience, and time since separation between participants with and without successful reintegration outcomes. Participants within the successful group were classified as "High" (*n* = 5) or "Moderate" (*n* = 13); those who lacked success in reintegration were classified as "Low" (*n* = 16) or "Minimal" (*n* = 4). The mean age of the overall sample was 33.6 (SD = 8.6); the successful participants were younger (mean age = 31.8). Thirty-one participants (82%) were male. Four participants self-identified as

Table I. Characteristics of Study Sample.

Characteristic	Successful Reintegration (n = 18, %)	Lack Successful Reintegration (n = 20, %)	Total (n, %)
Gender: Female n (%)	1 (5.6)	6 (30)	7 (18)
Age: Mean (SD)	31.8 (5.4)	35.2 (10.3)	33.6 (8.6)
Mental health diagnosis n (%)[a]			
• Depressive disorder	5 (27.8)	10 (50.0)	15 (39.5)
• Mood disorder	1 (5.6)	1 (5.0)	2 (5.2)
• Adjustment disorder	8 (44.4)	4 (20.0)	12 (31.6)
• Post-traumatic stress disorder	12 (66.7)	10 (50.0)	22 (58.9)
• Anxiety disorder	3 (16.7)	7 (35.0)	10 (26.3)
Diagnosis of traumatic brain injury n (%)	5 (27.8)	3 (15.0)	8 (21.0)
Combat experience n (%)	15 (83.3)	18 (90.0)	33 (86.8)
Time since separation by years mean (SD)	4.0 (3.5)	3.7 (3.7)	4.3 (3.5)
Reintegration outcome (based on analyst rating and M2C-Q score)	High 5 Moderate 13	Low 16 Minimal 4	

[a]Note: Totals are greater than 100% because participants had 1–3 mental health diagnoses.

African American, three as Hispanic/Latino, and four as "more than one race"; the remaining 27 identified as non-Hispanic White. The mean level of service-connected disability was 67%; over half had diagnoses of post-traumatic stress disorder and 21% had traumatic brain injuries. A total of three cases were dropped from the configurational analysis due to missing values. Of the remaining 35 cases, 16 cases had successful reintegration, and 19 did not.

Pathways to Successful Community Reintegration

The positive model (Figure 2) offered three solution pathways that explained successful community reintegration for 13 of the 16 cases (coverage = 0.81; consistency = 0.87).

The three solution pathways to positive community reintegration were a positive score for SOCIAL SUPPORT combined with at least one of the following:

- a +2 score for LIFE PURPOSE
- a positive score for MILITARY EXPERIENCE
- a positive score for CULTURAL ADJUSTMENT

In other words, of the 16 cases where successful reintegration occurred, four conditions made a difference: social support, having established a sense of "life purpose," having a positive military experience, and having a positive cultural adjustment. The yellow cells in Figure 2 demonstrate how these three pathways explained successful reintegration in 13 cases, whereas the green cells show the 2 inconsistent cases identified by the model but that did not have the outcome present. Importantly, these four conditions all serve as examples of contingency in that all four did not consistently link to successful community reintegration alone. For example, there are multiple cases with +2 values for social support below the dotted red line in Figure 2 where community reintegration was not successful. All four, however, were consistently linked to successful reintegration when combined with at least one other contributing condition.

CASE_ID	OUTCOME	SOCIAL_SUPP	LIFE_PURPOSE	SOCIAL_SUPP	MILITARY_EXP	SOCIAL_SUPP	CULTURAL_ADJ
134	1	1	2	1	1	1	1
146	1	2	2	2	2	2	-1
102	1	2	2	2	1	2	-1
135	1	2	2	2	1	2	0
160	1	1	2	1	1	1	-1
161	1	2	2	2	1	2	1
169	1	1	2	1	1	1	2
156	1	1	2	1	-2	1	-2
123	1	-1	2	-1	-1	-1	-1
105	1	2	1	2	1	2	-1
103	1	-1	1	-1	1	-1	1
124	1	1	1	1	1	1	-2
121	1	1	1	1	-2	1	1
101	1	1	-1	1	1	1	1
154	1	2	1	2	0	2	1
133	1	-1	-1	-1	1	-1	-1
152	0	-1	2	-1	1	-1	-1
168	0	-1	2	-1	-2	-1	-2
174	0	-2	2	-2	1	-2	-2
106	0	2	1	2	2	2	-2
108	0	2	1	2	-2	2	-2
144	0	2	1	2	-2	2	-1
130	0	2	-1	2	-2	2	-1
170	0	1	-1	1	-1	1	1
115	0	-1	-2	-1	-1	-1	1
166	0	-2	-2	-2	-2	-2	2
104	0	1	1	1	-2	1	-1
165	0	1	1	1	-2	1	-2
132	0	-2	-2	-2	-2	-2	2
143	0	-2	-2	-2	1	-2	-1
136	0	2	1	2	-2	2	-1
111	0	0	-2	0	-2	0	-2
131	0	-1	-2	-1	-2	-1	-2
163	0	-2	-2	-2	-2	-2	-2
126	0	-2	-2	-2	-2	-2	-2

Figure 2. Positive model for veteran community reintegration.

Figure 3 visually depicts the model with conditions and pathways together. Cases that fall within specific pathways are listed in columns, with the cases in red italics differentiating cases that are uniquely covered by a single pathway. Pathway A, which covered participants who had established a strong life purpose and reported positive social support, accounted for 8 of the cases; this solution path alone covered 50% of the cases with the outcome. Pathway B involved 10 cases where participants had positive social support and whose military experience had a positive influence on their reintegration. Pathway B and C cases are notable because they achieved re-integration despite specific challenges during or immediately following their separation. In-depth analysis of qualitative interviews revealed that seven of these cases had negative experiences after separating from the military, including premature medical discharges. Unique cases, such as P105, struggled with difficulties dealing with civilians in university courses, whereas P124 had strongly negative experiences with civilian co-workers. Pathway C included 6 cases with positive cultural adjustment and social support. The cases in this pathway include 2 consistent cases where either their military career or early separation experiences were negative influences.

Pathways Where Successful Community Reintegration was Not Achieved

Cases where reintegration was categorized as either "1" (Minimal) or "2" (Low) were analyzed to understand which combination of conditions were present among veterans who did not achieve success in community reintegration ($n = 19$). Figure 4 illustrates cases with the negative outcome. Consistency for the negative model was 17/17; in 100% of the cases where these

Figure 3. Solution summary for positive reintegration.

conditions (or configurations with two conditions) were present, a negative outcome always resulted. The coverage for the overall negative model was also high at 0.89 (17/19).

The four solution pathways to unsuccessful community reintegration were:

- a −2 score for MILITARY TRANSITION combined with a −2 score for MILITARY EXPERIENCE
- a −2 score for MILITARY TRANSITION combined with a −2 score for CULTURAL ADJUSTMENT
- a −2 score for SOCIAL SUPPORT
- a −2 score for LIFE PURPOSE

These pathways suggest that the key conditions contributing to unsuccessful reintegration were the negative impact of lacking life purpose or social support, as well as a combination of a negative exit from military service coupled with a negative military experience or lack of cultural adjustment (see Figure 5). Many of the participants in this group had high disability ratings (all but two were greater than 50% rating) but varying levels of monthly compensation. Four of the six cases in pathway F (minimal social support) were women, and most discussed a lack of support from their partners, natal family, and from military peers. Pathway F (*n* = 6) includes cases where

CASE_ID	OUTCOME	MILITARY_EXP	MIL_TRANS	CULTURAL_ADJ	MIL_TRANS	SOCIAL_SUPP	LIFE_PURPOSE	GENDER
168	0	-2	-2	-2	-2	-1	2	1
108	0	-2	-2	-2	-2	2	1	1
165	0	-2	-2	-2	-2	1	1	0
111	0	-2	-2	-2	-2	0	-2	1
131	0	-2	-2	-2	-2	-1	-2	1
163	0	-2	-2	-2	-2	-2	-2	1
126	0	-2	-2	-2	-2	-2	-2	0
144	0	-2	-2	-1	-2	2	1	1
130	0	-2	-2	-1	-2	2	-1	1
104	0	-2	-2	-1	-2	1	1	0
136	0	-2	-2	-1	-2	2	1	1
132	0	-2	-2	2	-2	-2	-2	1
170	0	-1	-2	1	-2	1	-1	1
166	0	-1	-2	2	-2	-2	-1	0
115	0	-1	-1	1	-1	-1	-2	1
174	0	1	-2	-2	-2	-2	2	0
143	0	1	-1	-1	-1	-2	-2	0
106	0	2	-2	-2	-2	2	1	1
152	0	1	-1	-1	-1	-1	2	1
156	1	-2	-1	-2	-1	1	2	1
121	1	-2	-1	1	-1	1	1	1
123	1	-1	-2	-1	-2	-1	2	1
154	1	0	2	1	2	2	1	1
160	1	1	-2	-1	-2	1	2	1
161	1	1	-2	1	-2	2	2	1
103	1	1	-2	1	-2	-1	1	1
124	1	1	-1	-2	-1	1	1	1
102	1	1	-1	-1	-1	2	2	1
105	1	1	-1	-1	-1	2	1	1
133	1	1	-1	-1	-1	-1	-1	1
101	1	1	-1	1	-1	1	-1	0
135	1	1	0	0	0	2	2	1
134	1	1	1	1	1	1	2	1
169	1	1	1	2	1	1	2	1
146	1	2	-1	-1	-1	2	2	1

Figure 4. Negative model for veteran community reintegration.

housing instability is present, where a vocation or career is missing, and where geographic dislocation from establishing a new residence played a role in lack of connections. Pathway G included P115, who had experienced periods of homelessness and faced financial burdens, and explicitly discussed how he had shifted jobs (i.e., food services, security, and recording arts) but felt that he lacked a sense of purpose after life as a soldier.

Pathway D ($n = 12$) covers participants who had negative transitions and had strongly negative military experiences. Notably, over half of the total sample had a strongly negative military experience. Cases in pathway F discussed challenges with disclosing mental health symptoms related to, as one person explained, "the weight of masculinity," or the tendency of male soldiers to keep emotional issues to themselves. P144, who served for 15 months in Iraq and joined the National Guard after active duty in the Army, exemplified this pathway. When this participant sought medical attention for physical injuries and emotional trauma during deployment, he was treated solely with medication. Later, he described frustration with having to "re-prove" symptoms related to PTSD during the certification process for acquiring a disability rating through the VHA.

Pathway E describes another pathway a strongly negative transition from the military coupled with the strong negative influence of ongoing conflict with civilians in educational or work environments. Several of these participants identified strongly with the military during their service but had premature retirements, were discharged for medical reasons ("med-boarded"), or had difficulties gaining veteran benefits. Some participants with negative military experiences

Figure 5. Solution summary for negative reintegration.

described hostile relationships with leadership, sexual harassment, and moral injury (i.e., doubt about ethical issues about the activities or leadership decision during deployment).

Scrutinizing Cases and Outliers

Closer attention to cases that were not covered by either positive or negative pathways or that were difficult to explain offer additional insight into potential causes of reintegration outcomes. Three cases with negative outcomes despite several positive conditions are described in Figure 6, where selected attributes are jointly displayed with illustrative quotations.

   P106 and P170 were cases that had the attributes in Pathways B and C but did not achieve successful reintegration (i.e., "inconsistent" cases). Each had negative early transition experiences, had multiple combat deployments, and had disability between 50 and 100%. Likewise, their self-reported M2C-Q score would mark them as having some or more overall difficulty with reintegration (2.06–2.9). P106 is an example of a Marine Corps veteran who had a positive military career and feels a sense of purpose in terms of his career and family, but expressed strong ambivalence about interacting with civilians and frustration with a negative exit from the Marine Corps. P152 is a case unexplained by the solution pathways of the negative model. He had established a clear career path toward law enforcement (i.e., +2 for "life purpose") but experienced a "bitter and premature" separation from the military, had been divorced, and was the sole caregiver for his children when his wife was deployed. He had been diagnosed with adjustment disorder. P170 represents a case of someone having challenges with adjusting to a civilian environment while caring for children and dealing with injuries and financial instability, leading to less successful reintegration.

Figure 6. Relationship between conditions and outcomes in cases with unsuccessful reintegration.

Exemplar cases demonstrate the complex nature of contingent influences on reintegration. P161 offers an important counter example where reintegration was achieved despite considerable barriers. His difficult military transition was counterbalanced by having social support and securing work as an emergency department nurse, which helped with establishing a strong sense of purpose. Working as a military contractor may have also contributed to a delay in transitioning into civilian life. Yet, 3 cases with strong life purpose scores (+2) had poor reintegration. P168 was a one example who was "medically boarded" after deployment to Afghanistan and struggled with symptoms of PTSD, a TBI, and hip injuries. Reintegration issues remained despite his firm commitment to training young recruits as part of a Reserve Officer Training Corps and pursuing a career in automotive repair. In these cases, family stressors, health problems, and/or financial issues can diminish the ability to reintegrate even when a sense of purpose has been strongly established.

Discussion

In this study, we integrated configurational analysis with qualitative thematic analysis to model contingency and identify conditions that consistently differentiate between veterans based on their experiences in transitioning from military service to civilian life. We drew from a self-report reintegration questionnaire as well as evidence from in-depth interviews to identify specific solution pathways. Cases with successful reintegration included participants that had either established a strong life purpose, had positive social support, and had positive experiences with transitioning out of the military and with interacting with civilians. On the other hand, strongly negative scores for life purpose or social support were sufficient by themselves for the outcome of negative reintegration. Similarly, cases with a combination of strongly negative transition experience coupled with either negative military experience or negative military/civilian cultural adjustment were associated with less successful reintegration.

While health practitioners treating veterans may indirectly gather information about experiences working in or transitioning from their military service, less is known about the combination of phases and determinants of reintegration. One strength of this approach is an explicit focus on

understanding how multiple conditions can operate in contingent ways when explaining a complex phenomenon like veteran community reintegration. The social support condition in this study offers an important example, given that previous studies have suggested its importance in reintegration and suicide prevention in veteran populations. For those who successfully achieved reintegration, the presence of social support was to be a condition that was necessary but not sufficient for the outcome to appear. (Mackie, 1974). In this set of cases, successful reintegration was contingent on having positive social support but required an additional condition.

Contribution to the Field of Mixed Methods

In pairing a mathematical cross-case method with a qualitative method in order to model contingency, this study integrates data at the design and interpretation levels (Moselholm & Fetters, 2017). In assigning valence and magnitude to qualitative interview data, we illustrate how data transformation can supply numerical values for use as conditions in configurational analysis. The configurational approach offers a unique technique for understanding conditions that are "difference-makers," which offers insight into potential meta-inferences. Lastly, we employed the bottom-up approach of coincidence analysis to model positive and negative outcomes using the individual as the level of analysis. In seeking to understand the complex phenomenon of veteran reintegration, pairing qualitative analysis with configurational analysis facilitates configurational theorizing, where specific combinations of conditions may lead to the presence or absence of outcomes of interest (Furnari et al., 2020). The process we followed to model contingency was comprised of four phases. First, rich qualitative data was collected in order to elicit nuanced responses related to psychological constructs like "life purpose," "cultural adjustment," and others and subjected to inductive analysis. Second, we systematically scored constructs in these transcripts, assigning values using a 5-point ordinal scale that ranges from +2 to −2 with calibrated anchors. Third, we applied configurational methods to identify contingent relationships linking specific construct-values with each other using cross-case analysis. Finally, we returned to the cases to explore and explain these contingent relationships in context and in greater depth. We are aware of few CCMs studies that return to close analysis of outlying cases—those not covered by pathways or inconsistent cases for both the presence and absence of an outcome—to gain a nuanced understanding of underlying dynamics that may explain the phenomenon of interest.

Prior configurational studies have used qualitative-driven mixed method designs, such as early studies of the role of family and culture in eating disorders (Haworth-Hoeppner, 2000), disclosure of intimate partner violence in antenatal care (Spangaro et al., 2015), and sociocultural influences in teen suicide among Latinas (Gulbas and Zayas, 2015). Like the present study, use of rigorous qualitative methods such as grounded theory and close examination of outlying cases strengthen the ecological validity of the findings. Cases were calibrated using a triangulation approach that drew on the range of data available (Basurto & Speer, 2012; de Block & Vis, 2019). We have demonstrated how moving from thematic analysis to configurational findings and back to individual cases enriches how we understand community reintegration with the individual as the unit of analysis, with attention given to presenting jointly displaying interconnected configurational data on specific cases (Krohwinkel, 2015). While the "unidirectionality" of configurational approaches (i.e., "the opposite of solution pathway is not necessarily associated with the opposite of the outcome") can be labor intensive (McAlearney et al., 2016), we view the analysis of the negative outcome as integral to understanding the original research question. For studies with clear outcomes, such analyses provide actionable results that may be used to design or tailor programs.

Contingency modeling provides a novel contribution to mixed methods research. Integrating configurational methods and qualitative thematic analysis offers the possibility to study and model

complex phenomena through identification of cross-case pathways and then returning to rich qualitative data to "unpack" these solutions to understand how particular conditions link to outcomes in practice. Whereas studies using Qualitative Comparative Analysis typically conclude with the reporting of configurational results, contingency modeling views model identification as an intermediate analytic step to be followed by in-depth exploration of how specific contingent elements within a model work together in context.

Scholars have pointed out that the "mixing" of methods has a long history in the social sciences, with some arguing that the distinction between quantitative and qualitative data is fallacious (Pelto, 2015). Ercikan and Roth (2006) argue against such "polar distinctions" and propose focusing on research questions rather than "methods," encouraging multiple modes of inquiry and collaboration between researchers who have been interpellated as either qualitative or quantitative. They offer an integrated approach that classifies knowledge gained through research on a continuum between "low inference" and "high inference." Descriptive studies can include either type of data but deal with context, nuance, and particularity. Data condensation and abstraction, such as the coincidence analysis and contingency we describe here, enable higher level meta-inferences that would be difficult to arrive at using a single method.

Some limitations are worth noting. This cross-sectional study included veterans who served after 2001, were using educational benefits, had an invisible injury, and were treated at a single medical center in the United States. Our explanatory models helped account for veteran community integration outcomes across the 35 participants in this analysis, which was the goal of this mixed methods study. As this group may not be representative of broader patterns in post-9/11 military veterans, these findings may not generalize to other veteran populations. The fact that the M2C-Q was framed in negative, time-limited terms ("difficulties in the last 30 days") may explain some of the differences between self-reported and analyst calibration of reintegration outcomes. Another limitation is that some participants had separated over 10 years prior to being interviewed, which may have increased the likelihood of recall bias. However, a strength of this research is empirical convergence with closely related research, such as studies of how negative, gendered military experiences affect mental health and reintegration among women veterans (Dichter & True, 2015) and those that that link the lack of a sense of mission to negative or complicated reintegration experiences (Smith & True, 2014). Our approach builds on these studies by identifying specific conditions rather than general themes that relate to veteran reintegration.

Conclusion

The pairing of configurational methods with qualitative thematic analysis offers a rigorous approach to model contingency and identify difference-making conditions that explain veteran community reintegration outcomes. Configurational analysis enables health researchers to identify solution pathways across cases, whereas qualitative thematic analysis offers an approach to develop fine-grained explanations for these solution pathways in context. In this study, qualitative thematic analysis alone did not identify difference-making conditions across cases, such as the importance of "social support" in the positive model. Integrating configurational analysis with qualitative thematic analysis provided a convergent mixed methods approach to model contingency, identifying solution pathways that explained veterans' success or failure in reintegrating into civilian life.

Appendix 1. Codes from Thematic Analysis Used in Configurational Analysis Conditions

	Code	Description	Parameters	Representative Quotations for Strong Influences
1	*CUL—* cultural	Refers to both values, beliefs, and motivations among participants as well as conflicts with civilian cultural practices. (Demers, 2011)	+2 = prefer civilians over interactions with veterans or is well adjusted +1 = able to cope with civilian interactions, or talks about it in passing 0 = no mention/absence −1 = annoyance or periodic discord with civilians −2 = significant issue, persistent unease, or feeling of being detached	+2: "I haven't felt isolated or I like I don't belong or anything like that. Yeah, there's nothing there." −2: "Feeling like you belong in a civilian society? No, I don't. I don't belong in a civilian society. I belong in a military society."
2	*DIS—* disclosure	Preference about disclosing aspects of mental or physical impairments or disability or about military experience (Jeffreys et al., 2010)	+2 = actively seeking help for condition through open disclosure +1 = benefits gained from partial or delayed disclosure 0 = no mention/absence −1 = reluctance to disclose minor condition, forced into disclosure −2 = strong negative outcome from lack of disclosure, stigma related to issue	+2: "When I self-identify, if it's pertinent to the conversation or if I'm trying to build a rapport with somebody, and it's one step up. It kind of skips a step, then I will do that." −2: "I knew that I knew I had a mental health problem …even when I was being seen here it took me a while for me to just openly volunteer that information."
3	*FIN*—financial	Financial or economic considerations that affect career, military, or educational outcomes	+2 = financial situation influences reintegration strongly +1 = finances or benefits aid in reintegration 0 = no mention/absence −1 = some financial issues that hinder reintegration −2 = major financial distress	+2: "I had a lot of money saved up from deployment and from my service in general. Just like I'm financially frugal, and I just knew. I had a plan that I knew that I was gonna save all this money. Not spend it." −2 "At one point, I had to borrow money from my parents. I'm in my 40s. Talk about uncomfortable and embarrassing, but that's because the GI Bill folks lost the paperwork."

(continued)

Appendix 1. (continued)

	Code	Description	Parameters	Representative Quotations for Strong Influences
4	*GEN*—gender	Describes issues, experiences or behaviors influenced by gender (Eichler, 2017)	+2 = significantly positive effect +1 = comfort with gender role 0 = absence −1 = gendered roles are minor negative influence −2 = discrimination affects experience; gender roles have negative influence	+2: "There's a pride factor there and I've kind of lost my pride after. You know because after deploying, you kind of have to just break down and admit you know like something's wrong. You know and then when other people are telling you or your family and your kids are saying you know these things about you and it's not good." −2: "before I got out we used "to make fun of PTSD you know because, "Oh you're not man enough; you're not tough enough."
5	*LIF*—life purpose	Degree to which individual has sense of purpose sought through meaningful work activity or vocation. (Castro and Kintzle, 2014)	+2 = sense of achievement or fulfillment +1 = identified or articulate purpose with little action 0 = absence −1 = recognition that life purpose is missing and minor negative impact on reintegration −2 = lack of life purpose or lack of direction with chosen major/career significantly hampers reintegration	+2: "My unofficial, the stuff I don't get paid for, is the stuff I'm extremely passionate about is advocacy. I'm a board member of several 501C3s." −2: "I don't know where I'm supposed to be, and I'm lost still. That's my problem is that like I have no direction right now other than I know that I need to be in school doing something."
6	*MIL*—military impact	How military experience has shaped current processes of reintegration. Includes harmful and beneficial impacts. (Elnitsky et al., 2017)	+2 = military experience has strongly positive effect on reintegration +1 = minor beneficial effect 0 = absence −1 = minor negative impact −2 = military career hampers reintegration and advancement	+2: "It's helped with the structure and the organization. Definitely brought out the confidence you know in me. Actually not be afraid to tackle a situation like I used to be or I used to be kind of like timid." −2: "I got off and I was crying all of the time. This is not where my life was supposed to be. I was there a year but probably like 13 months. I felt like I was right in the middle of this fire zone and everyone's dying and everyone's you know and it was hard."

Appendix 1. (continued)

	Code	Description	Parameters	Representative Quotations for Strong Influences
7	*MTA*— military transition assistance	Impact of pre-military discharge transition assistance programs on early transition period (1st 3–6 months) (Sokol et al., 2021)	+2 = highly positive experience with formal transition program or subjective perception of "seamless transition" +1 = generally positive transition; minor setbacks 0 = absence −1 = negative transition with minor difficulties −2 = major barriers during transition	+2: "My separation from the military was pretty much easy. I already had a job lined up working with kids so that there I transitioned pretty well." −2: "When I got out I was pissed at the military and anything to do with military. Nothing, it was after all them years and all that work I put into it. It was, 'Bye kiss my ass, go away.' I was angry for quite a while."
8	*SOS*—social support	Any issue that involves - Intimate relationships - Family units - Networks of friends - Institutions and communities (Cunningham et al., 2014; Yazicioğlu et al., 2006)	+2 = strong social support +1 = minor social support 0 = absence −1 = few sources of social support; inadequate −2 = socially isolated; poor social support	+2: "I'd say my family and friends are you know the real rock that you know keeps me moving. You know I've created some bonds with people here also; you know this therapist that I've seen, you know social workers, stuff like that." −2 "I'm not really much of a phone talker or real big on social media or anything so it makes it kind of difficult. I've lost more than I've kept like a lot more so I mean that makes it difficult you know."
9	*WEL*—well-being	Symptoms, effects, and issues related to how physical and mental health conditions from military service affects reintegration and educational experiences	+2 = actively seeking professional assistance; lack of condition +1 = beginning stages of recovery; minor condition with minor effect 0 = absence −1 = recognition of condition but limited or no effort to seek professional assistance −2 = significant condition hindering quality of life	+2: "Luckily and amazingly, I got out of the type of work that I did with no injuries that would be service connected." −2 "Yeah, I'm half blind. That's due to the shrapnel in my brain ..I was blown up."

Appendix 2. Scored Ordinal Values for Participants

Participant ID	Outcome = Successful Reintegration	Gender	Life Purpose	Military Experience	Social Support	Cultural Adjustment	Military Transition
134	1	1	2	1	1	1	1
158	1	1	2	0	1	MR	−1
146	1	1	2	2	2	−1	−1
102	1	1	2	1	2	−1	−1
135	1	1	2	1	2	0	0
160	1	1	2	1	1	−1	−2
161	1	1	2	1	2	1	−2
169	1	1	2	1	1	2	1
123	1	1	2	−1	−1	−1	−2
156	1	1	2	−2	1	−2	−1
105	1	1	1	1	2	−1	−1
154	1	1	1	0	2	1	2
103	1	1	1	1	−1	1	−2
124	1	1	1	1	1	−2	−1
121	1	1	1	−2	1	1	−1
153	1	1	0	0	−1	MR	−2
101	1	0	−1	1	1	1	−1
133	1	1	−1	1	−1	−1	−1
176	0	1	MR	1	−1	−1	−1
152	0	1	2	1	−1	−1	−1
168	0	1	2	−2	−1	−2	−2
174	0	0	2	1	−2	−2	−2
106	0	1	1	2	2	−2	−2
108	0	1	1	−2	2	−2	−2
144	0	1	1	−2	2	−1	−2
130	0	1	−1	−2	2	−1	−2
170	0	1	−1	−1	1	1	−2
115	0	1	−2	−1	−1	1	−1
132	0	1	−2	−2	−2	2	−2
104	0	0	1	−2	1	−1	−2
165	0	0	1	−2	1	−2	−2
166	0	0	−1	−1	−2	2	−2
143	0	0	−2	1	−2	−1	−1
136	0	1	1	−2	2	−1	−2
111	0	1	−2	−2	0	−2	−2
131	0	1	−2	−2	−1	−2	−2
163	0	1	−2	−2	−2	−2	−2
126	0	0	−2	−2	−2	−2	−2

2 = strong positive 1 = weak positive 0 = neutral impact −1 = weak negative −2 = strong negative MR = minimally referenced (insufficient information to assign a numerical score; these values were dropped from the configurational analysis due to missing value)

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ORCID iDs

Nicholas A. Rattray https://orcid.org/0000-0002-9683-889X
Edward J. Miech https://orcid.org/0000-0002-7187-1570

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