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Abstract

Grounded theory methodology was utilized to investigate the process of memorization of the Quran in India from a psychological perspective as it occurs in the absence of semantic comprehension of the Arabic language. Data collection methods included participant observation in a seminary, semi-structured interviews with students and teachers of memorization, study of documents employed during the learning process, and practical demonstrations. Sample comprised of thirteen individuals including students and teachers. Data coding and analyses resulted in a large number of open codes, and eleven axial code categories besides a selective code that gave a comprehensive summation of the research study and facilitated in the generation of a substantive theory of memorization of the Quran in India. Different methods of data display were construction of matrices and tables, diagrammatic representation of axial codes to depict the main theme, case summaries, in-vivo quotes of the subjects, and summations of practical demonstrations. The research employed five methods of implementing evaluative criteria including: triangulation, audit trail, reflexivity, prolonged engagement and persistent observation, and rich, thick description to ensure the credibility of the data, research process, and research outcomes which was to generate a comprehensive understanding of memorization as a unique learning paradigm.

Keywords

qualitative research, grounded theory methodology, participant observation, semi-structured interviews, constant comparison, qualitative evaluative criteria

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Grounded theory methodology was utilized to investigate the process of memorization of the Quran in India from a psychological perspective as it occurs in the absence of semantic comprehension of the Arabic language. Data collection methods included participant observation in a seminary, semi-structured interviews with students and teachers of memorization, study of documents employed during the learning process, and practical demonstrations. Sample comprised of thirteen individuals including students and teachers. Data coding and analyses resulted in a large number of open codes, and eleven axial code categories besides a selective code that gave a comprehensive summation of the research study and facilitated in the generation of a substantive theory of memorization of the Quran in India. Different methods of data display were construction of matrices and tables, diagrammatic representation of axial codes to depict the main theme, case summaries, in-vivo quotes of the subjects, and summations of practical demonstrations. The research employed five methods of implementing evaluative criteria including: triangulation, audit trail, reflexivity, prolonged engagement and persistent observation, and rich, thick description to ensure the credibility of the data, research process, and research outcomes which was to generate a comprehensive understanding of memorization as a unique learning paradigm.

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Introduction

Grounded theory methodology (Strauss & Corbin, 1990) was utilized to study the phenomenon of memorization and to construct a substantive grounded theory of the memorization of the Quran "to generate subject and situation specific knowledge and practices" (Flick, 2006). Memorization involves committing the entire text of the Quran to memory and recalling and reciting any of its over 6000 verses from memory. It has not been subjected to empirical investigation and there was ambiguity regarding "the constructs to be studied," and understand its psychological and behavioural characteristics in its "socio-cultural context" (Karasz, 2011). This research study had taken real-time instances of a recurring phenomenon and had tried to understand it in all its complexity. I decided on utilizing the GT methodology as I found it most suitable due to its inductive reasoning approach, and then collected the data in keeping with theoretical sampling and tried to generate a comprehensive understanding of memorization (Bryant, 2017) and derive core concepts that underpin this phenomenon (Strauss & Corbin, 1994) When I began the research work my aim was modest: to create conceptual clarity about the memorization process, identify and construct categories

that comprise and contribute to memorization, and identify the linkages between them (Timonen et al., 2018). I was wary about generating a "theory" of memorization.

About the Research Domain

In India and some non-Arab countries, the Quran in Arabic language is memorized without learning the meaning or the semantic comprehension of the verses being memorized by thousands of students, most, but not all of them, in the age group of 10 to 20 years. The Quran is the religious scripture of the Muslims. The performance outcomes for memorizers are the precise reproduction of the text, with accurate diction, and zero-error recital so that the recitation of an Indian memorizer is as faithfully identical and intelligible as a native Arabic-speaking reciter's recital.

Memorizers follow a standard print of the Quran of about 600 pages, with 15 lines on each page. Its structural organization divides it into progressively smaller segments, and each has a distinct name and numerical code. The first level segmentation are the 30 divisions (N=30) which are approximately 20 pages each. They are followed by the chapter (N=114) which are of unequal length and distributed across the 30 divisions. Further, each of the 30 divisions are subdivided into sections which have only a numerical code with reference to its division, and each division has variable number of sections (N= 16 to 22). The sections contain the verses which are the smallest level segmentation, and the verses are numbered with reference to their specific chapter. There is an aggregate of about 6236 verses. Every student has his personal copy of the Quran, and invariably memorizes, revises, and gets assessed with reference to it.

Steps in the Research Study

As a Muslim I was familiar with memorization of the Quran and its religious significance as most practicing Muslims memorize a few short chapters of the Quran to recite during the daily prayers, but as a psychologist I was intrigued about many of its aspects such as how do students memorize without understanding the meaning of the Arabic language, how can they encode, store and retrieve over 600 pages, how are they taught to read and memorize the Arabic. I was at the cusp of two different domains: of psychology and memorization of the Quran, and I was convinced that the latter needs to be investigated and its outcomes would be worth disseminating.

The methodology followed in the present research was based on Strauss and Corbin's (1994) approach to GTM. The research steps were pre-data stage, followed by data collection stage which included engaging in participant observation, construction of an interview schedule, collecting data through semi-structured interviews and practical demonstrations, collecting formats of documents utilized during the memorization process, coding data, and analyzing it, displaying data and writing the research report. Both the research methodology as also the research domain were greenfield areas for me. And taking "grounded" seriously (Timonen et al., 2018) throughout the research processes of data collection and analyses helped me get my moorings when I had floundered and doubted if I was making sense of my research topic. My experience in sharing information with my supervisor and departmental committee (Nagel et al., 2015) about using the GT method for my research included conducting a GT methodology survey of research literature, writing and crafting seminar presentations with the awareness that they were unfamiliar with the GT.

The Pre-Data Stage

Pre-data stage was conducted before beginning the data collection and it involved three different actions: I visited a seminary for informal and unstructured interviewing; interacted with professors in our university; and perused the textbooks of cognitive psychology, in order to develop a keen understanding of the topic necessary for proceeding further. "How do students memorize the Arabic text of the Quran without learning to comprehend the Arabic language?" This generative question led to the first iteration of theoretical sampling, which was the pre-data stage to gain preliminary understanding of the memorization process**.** Initially informal interviews were conducted with three students who were engaged in memorizing the Quran. I visited a seminary, which is an educational institution that offers courses related to religious education, in which students were taught the memorization of the Quran and interacted with teachers who taught memorization I interacted with a professor of psychology with expertise in cognitive psychology, professors in the department of Arabic who had also memorized the Quran and a professor in the department of oriental studies with the aims of discovering if there was research literature on the memorization of Quran, and how to plan and conduct my research study. Cognitive psychology readings were the first round of literature review, and it revealed the skilled memory theory and long-term working memory (Chase & Ericsson, 1980; Ericsson et al., 1980, 1993; Ericsson & Chase, 1982; Ericsson & Polson, 1988b; Ericsson & Charness, 1994; Ericsson & Lehmann, 1996; Ericsson & Kintsch, 1995), language learning and developing reading expertise (Sternberg, 2006)**.** The conclusions of these interactions and readings were that although memory has been vastly researched in cognitive psychology, the memorization of the Quran has not been the subject of a systematic and empirical study in psychology. It is a significant phenomenon not only in cross-cultural psychology but also cognitive psychology because it occurs in the absence of semantic comprehension. It is a unique case of memorization of a large amount of textual material by hundreds of students. Generating a thorough understanding of memorization may add to, extend, or modify the existing theories and models in cognitive psychology. Studying it within the purview of existing theoretical constructs would limit the scope of its study due to the absence of semantic comprehension and the yet unidentified processes involved in such memorization. One outcome of the pre-data stage was that I was convinced that I need to find a research methodology that would guide me without constricting my investigation. Reading about GTM (Flick, 2006) as a qualitative research methodology and also a couple of doctoral dissertations on google scholar convinced me that it would do justice to this investigation. GTM attracted me with its combination of structure in the form of multiple data collection methods and data analyses through constant comparison and three stages of coding along with freedom to explore this field and generate authentic understanding GTM is best suited to study this phenomenon in an empirical and objective manner as it allows the mapping of the features of the domain, capture its complexities, and identify the linkages, and similarities and dissimilarities with the extant theories and models in cognitive psychology. Other outcomes of the pre-data stage were a brief introductory explanation about this research study that was formulated to put the subjects at ease and create a context for research questions.

Methods of Data Collection

Participant observation, interviewing, and collection of documents were the data collection methods. In addition to these methods, I also utilized practical demonstration to collect data during my participant observation and interviews with students.

Participant Observation

As a participant observer (Spradley, 2016) I was actively participating as a student of memorization along with my functional role as a researcher. I was an "active member" **(**Adler & Adler, 1987, in Cohen & Crabtree, 2006) as it involved a functional role in addition to an observational role. I approached the seminary where I intended to conduct participant observation and explained to the teacher-cum-principal about my research into the memorization of the Quran, that I would be learning Stage 1 which involves the phonemics of Quranic Arabic and Stage 2 which is fluent reading with the correct diction, that I would be interacting and observing her students to understand how they are memorizing. Further I would not be mentioning any identifiable markers for herself, her students, and her seminary in my dissertation; and I would be using a code-name to refer to her seminary, herself, and her students, and I solicited her cooperation and permission, which she readily granted.

The participant observation was overt observation, not covert. S5, S6, S7 and S8 are children/students of the principal. S5 and S6, both below 10 years, were assessors to the many women students who came to the seminary to learn the correct pronunciation of the Quranic Arabic as it is used in their daily prayers and S5 and S6 were assessors to them. They were aware that I was learning Quranic Arabic like the other women students as well as trying to understand how they were memorizing, and they showed me how they were learning to memorize and many of these were structured interactions that I named practical demonstrations.

This openness and sharing information about my objectives with the teacher and her students, facilitated trust and acceptance and increased my identification with the students in the seminary.

Participant observation was used as the domain of memorization of the Quran is unexplored and little is known to explain the behavior of people in this particular setting (Cohen & Crabtree, 2006), and its benefits were that it fostered an in-depth and rich understanding of the phenomenon, the socio-cultural setting and the behavior of the participants in it and provided the foundation for theory development (Cohen & Crabtree). As I was observing my fellow students who were engaged in full time memorization (S5, S6, S7, S8 and S9) I was constantly constructing many inferences based on their behaviours, the explanations they were offering to my queries, and the documents they are using including the text of the Quran (Spradley, 2016). Immersion and prolonged involvement in the setting of the seminary led to the development of rapport between myself and the subjects, and fostered free and open speaking with them. Perspectives of the insiders in the situation of the seminary was given importance and the everyday life of the students and teachers as the foundation of inquiry is recognised (Jorgensen, 1989). And it facilitated in the interpretation and understanding of memorization of the Quran as a human endeavour in all its complexities. The topic is relatively unexplored, and little is known to explain the behavior of people in this particular setting and self-report data was substantiated with actual behavior (Cohen & Crabtree), as the use of direct observation along with other methods of gathering information gave a 360-degree perspective of the situation (Jorgensen).

As a participant observer, I learnt some important skills (Bernard 1988, in Cohen & Crabtree, 2006). It was overt observation, not covert observation. I did not hesitate to ask my young peers what is meant by a particular term they were using, and as peer assessment is an important aspect of learning in the seminary and the S5 and S6 assessed older women students, age is not considered important in this scenario, but competence in the proficiency parameters is essential. I learnt to speak and understand the terminology of the students in the seminary and their insider phrases, which integrated me in the seminary and increased my acceptance and the students opened up about their learning with me. Though most of the subjects were

young, they patiently explained the terminology they used and what it means in simple non-technical terms. I accumulated information of the minute details of the process of memorization and how it is integrated in their daily life. These details are often taken for granted by the subjects and they might not perceive it as important. Participant observation (Timonen et al., 2018) helped me to contextualize the data that I was generating through semi-structured interviews and seek clarifications and I discovered the importance of certain instructional practices that were not obvious during interviewing. For instance, the importance of mutual peer assessment as a learning tool for the assessor, for sharpening his error-monitoring and consequently his learning and self-monitoring skills. A fellow student who assesses another student's recital is the peer-assessor. My practice for learning the Stage 1 as well as developing a method for jotting notes helped in accumulating a fund of data and supporting behavioural evidence.

Participant observation also helped me to transcend the many precepts of culture-bound psychological theories (Spradley, 2016), and appreciate the differences in the treatment of certain teaching and learning practices such as minimizing the importance of time taken to learn and memorize, and how success and failure is defined in memorization. I had to put aside some of my preconceptions due to my educational background and elicit information about different facets of learning and memorization. For instance, language learning and levels of processing models in cognitive psychology literature assert the importance of semantic processing for encoding, storage and retrieval, but Quran memorization was occurring without developing semantic comprehension, supported by an elaborate and systematic retrieval system and retrieval cues. And developing the ability to write comfortably and clearly was crucial as I was communicating about a little-known phenomenon. Writing and rewriting with the awareness that the readers and reviewers of this research study and prospective publications, would be unfamiliar with the domain as it is a green-field research topic helped me to focus on putting across my findings with clarity.

Documenting Participant Observations. I wrote field notes (Burgess, 1991, in Cohen & Crabtree, 2006) to record the behaviors, activities, events and other features of the seminary and to understand the phenomenon of memorization and its culture and social situation. I did not use templates to collect data as they might deflect attention from unnamed categories and unanticipated activities. I wrote the field notes as soon after observation as possible and they contain the date, time, location and details of the main informants. I tried to provide a detailed, coherent description of what I observed. Analysis of notes as they were being prepared was preliminary analysis that fostered self-reflection, which was crucial for generating understanding as it revealed emerging themes.

Daily diary of learning was one of the two documents that I maintained for writing my field notes in the seminary during the course of my participant observation. It tracked my learning process, difficulties I encountered, mistakes I made, clarifications I sought, my "aha" moments, the progress I made, my teacher's and my peer-assessors' interactions with me regarding my learning were captured in this document.

Seminary notes about other students in the seminary was the second document in which I captured my interactions with the students and the teacher, how the students were memorizing and revising, the progress they were making, the amount of material they were memorizing during a specific day, their memorization and retrieval schedules that reflected the rate of their progress, and the process of memorization developing in them and I conducted a number of practical demonstrations with them.

Interviews

I had used semi-structured interviews for collecting data from the participants. I constructed and used an interview schedule with two forms for the students and for the teachers. The pre-data stage sharpened my focus on the questions I should include in the interview schedule.

Developing the Interview Schedule. For the development of the interview schedule, I had followed the guidelines of the "developmental research sequence method" elucidated by Spradley (1979) to frame questions that aim to find answers at the following levels of scale of analyses. Each scale of analysis is illustrated as follows:

> **Macro level 1 issue:** Socio-cultural issues that motivate a family and parents to admit their child in a seminary for the memorization of the Quran.
>
> **Macro level 2 issue**: Who took the decision in the family, why and how? Who monitors the child's progress and how?
>
> **Intermediary level 1**: What are the instructional methods in the seminary?
>
> **Intermediary level 2**: How does the teacher facilitate the memorization process?
>
> **Individual/micro level 1:** How does the student learn, memorize, rehearse, recall?
>
> **Micro level 2:** What are the cognitive processes involved and what are the mnemonic strategies that the particular student uses?

The interview schedule was reviewed for comprehensive coverage of content, suitability, and ease of understanding by my research supervisor and a memorization teacher, and based on their inputs certain items were rephrased, combined or deleted. A few items were added to the interview schedule during the process of data collections that were deemed relevant to further the understanding of the phenomenon. The questions were used as a flexible guide. Additional questions were asked during the interviews in order to elicit further information or to explore other aspects relevant to the research questions. The interview schedule was translated into the Urdu language by a qualified Urdu teacher for ease of understanding by the subjects who were conversant in the language.

Recording Semi-Structured Interviews. I had a paper-based interview schedule that I referred to and made detailed notes of the answers of the subjects, noted the technical phrases, asked for explanations, and sought clarifications on issues. I conducted multiple interviews with many of the subjects, and each session was of 1 to 3 hours duration. This variation in the number and duration of the interviews was due to the fact that some of the subjects offered more information, more examples and elaborations, and practical demonstrations. My criteria were to elicit information by covering all the questions from the interview schedule in minute detail.

Some of the interviews were conducted at the seminary in which the participant was studying or teaching, or at the participants' home. I took down detailed notes, and these were transcribed verbatim and keyed in immediately afterwards. Any clarifications, doubts and additional information were referred back to the subjects who willingly obliged. Digital audio recorder was not used as the participants would feel self-conscious and become inhibited in their responses.

Practical Demonstration

Practical demonstrations evolved in an effort on my part to appreciate some aspects of memorization in depth. The data that was generated through semi-structured interviews gave answers and explanations that were in conscious awareness of the subjects, but when enquired about some aspects of memorization and for details they gave incomplete answers or were at a loss for words or the stock answer was that you simply repeat it till it gets fixed in your memory. Participant observation clarified some of the research issues and I discovered some explanations to how memorization occurred as the social-cultural milieu of the seminary was appreciated and many of its instructional practices were observed at close quarters, their rationale and their implementation and the learning outcomes they promoted were understood. But I was still not able to find answers, in cognitive terms, about how a student mastered 600 pages of text in a language he did not understand and recalled a target verse without confusing it with another one. Responses to interview questions and participant observation gave descriptions of the actions of the subjects, but I was looking for insights of the descriptions. "Tell me about…" queries were inadequate, so I decided to ask, "show me how you do it?" and this led to the development of "practical demonstrations" as tool for data generation, both during interviewing and in participant observation. They were utilized to confirm observations generated during the participant observations and as impromptu experiments.

Practical demonstration is a structured interaction between myself and the subject about a particular aspect of the phenomenon in order to elicit information that has been automatized, is beyond conscious awareness and taken for granted by the subjects. Trying to elicit information about such a phenomenon through questions gave imprecise answers, especially in the case of children. So, when I asked the subjects to "show me" rather than "tell me," ... they yielded rich evidence on certain aspects such as multi-modal learning including visual imagery of a particular page; coordination of the articulatory system and the phonological loop during initial stages of memorization; development of metacognition and its role in learning and memorizing; mechanism for error-monitoring, detection, and rectification; types of phonetic and prosodic errors; developing a system of retrieval cues and retrieval structure.

An instance of a Practical Demonstration. I wanted to verify whether the numerical coding system of the verses and chapters of the Quran work as retrieval cues and form part of the retrieval structure for the subject. Therefore, I called out the number of a particular verse in an identified chapter and asked the subject to recollect the wording of the verse.

- In response, the subject started a sub-vocal recital of verses which occur prior to the target verse, then counted the number of each of these verses, and then identified the correct number of the target verse.
- This practical demonstration leads to a tentative conclusion that the number of the verse is not the primary retrieval cue for its recall, it is a subsidiary cue. The preceding one or two verses are the primary cues for recall of the target verse. The first verse that occurs on a particular page is the master cue for the subsequent verses that occur on that page. Further, though serial learning is occurring in which the chronological order of output/recall is same as the input/encoding order, this serial learning-based recall does not persist. After completion of memorization and an extensive amount of revision, each verse is recalled as an independent unit by itself.

Collecting Documents

I collected and analyzed the following documents used in the daily work of the seminary during the memorization process to develop understanding (Cohen & Crabtree, 2006). Daily diary of the student consisting of the recital tracking sheet, error-monitoring sheet, report card of the student, and the head-teacher's register of students.

Blank formats of the daily diary and error monitoring sheet were collected, analyzed, and translated into English from the Urdu language. When analyzing these documents, I focused on the fact that they were created and standardized to capture real-time data during the memorization process with the purpose of providing formative feedback (Shute, 2008) in order to identify the exact lacunae and improve the student's performance. The daily diary is used to provide concrete, authentic, objective data on each of the student's recitals.

Daily Diary. It consists of the recital tracking sheet which is a standardized format written in the Urdu language and it is filled by the student, and it captures the data on a daily basis. I had taken a copy of the same and translated it into English. It captures the amount of the new lesson memorized for the day, and the amount of already memorized material that is recited in each of the three retrieval cycles.

The student memorizes some quantity of new text every day which I termed the current lesson. Besides this text, he has to retrieve and recite three different quantities of the text segments which he has already memorized, on a daily basis, which are the three retrieval cycles. The first retrieval cycle consists of the current lessons that were memorized during the preceding five days. The second retrieval cycle consists of one complete *para* or approximately 20 pages that precedes the current lesson and involves repetition of the first retrieval cycle. Since it involves one complete *para* or approximately 20 pages, a student might recite two adjoining *para*, depending on where the current lesson occurs in its *para*. The third and last retrieval cycle consists of recital of one or two complete *para* that have been memorized since the beginning of memorization. All the three retrieval cycles run in a continuous loop of recitations till the student completes his memorization and the current lesson gets amalgamated into the first retrieval cycle, and this process is recursive; besides the data about the current lesson and the three retrieval cycles, and the names of the peer assessors and the teacher who assessed each of these four recitals are also mentioned in it.

Error-Monitoring Sheet. It is the document that captures the errors that were identified in the second and third retrieval cycles, and is filled by the assessor, who is either a teacher or a peer. The errors in the current lesson and the first retrieval cycle are marked in the student's personal copy of the Quran. While the recital tracking format captures the quantities of memorized and revised text segments, the error monitoring format and text of the Quran capture the errors in each of those recitations separately.

The errors committed in each of these four daily recitations are captured separately, and not aggregated. It is significant that the identified errors are all phonetic mistakes—incorrect enunciation, wrong pronunciation, insufficient or excessive stress on syllables—and phrases or verses that were forgotten. Semantic mistakes, that involve the connotations of the word, are not identified.

Report Card. It is a brief standardized document to capture the bi-annual and annual examinations results of the students and is similar to the report card issued by general education schools and colleges that capture the performance results of the bi-annual and annual examinations.

Register. The students' register is maintained by the head-teacher to monitor the students' attendance, track progress of the student - whether it is slow, steady, or fast; if a student is able to memorize a new lesson every day, time taken to memorize a division of the Quranic text.

These documents were analyzed in tandem with other data that was collected. The students' completed forms were not used as the basic purpose was to understand what kind of data was given importance during the memorization process, how it was systematically captured and for what purpose it was used. Comparison between subjects is not part of the research design as the final performance outcome was standardized for all students. There were no grades as in general education. Time taken to complete memorization was not a significant variable or a performance measurement parameter for students. The number and types of errors committed were not parameters for measuring the performance outcomes, they were data for improvement purposes because the cardinal performance parameter was exact enunciation of the Arabic text, on-demand recall, and recitation of any of the over 6000 verses given specific retrieval cues.

Sample

The total sample comprised of thirteen (N=13) individuals distributed into three groups including students of memorization, teachers of memorization and participant observation sample. Semi-structured interviews were conducted for a group of seven individuals comprising students (N=4) and teachers (N=3). Participant observation sample included the teacher (N=1) and students (N=5) besides myself. Practical demonstrations were conducted on the students of the interview group and the students of the participant observation group (N=9).

Utilizing the student's form of the interview schedule, I collected data from the Subject 1 (S1) and analyzed it. The process of analysis allowed me to begin to develop an understanding and map the contours with regard to the research questions. Based on this initial open coding and tentative axial code categories, I decided the subsequent sampling. I interviewed and collected data from more students engaged in memorization.

Subject 1 was one of the students in the seminary, she was listening with great interest when I was engaged in an informal interview with the principal of the seminary and introduced herself as a student. She had over 30 years of experience as a teacher in a government school and served as the headmistress for 2 years before her retirement. She had retired a year ago and joined the seminary few months back to learn to memorize the Quran. She was included as one of the samples because of her age, the keen interest and understanding she was showing in this research by probing questions, the comparative information she was offering between general education and memorization of Quran due to her educational qualifications and experience as an educator and her ability to communicate and convey relevant information fluently in English. Due to the nature and purpose of this research study she was willing to cooperate and agreed to be interviewed. I interviewed her for 3 days consecutively for a duration of 3 hours every day. I transcribed her verbatim and keyed in the data and reviewed it. Any clarifications, doubts and additional information were referred back to the subject who willingly obliged.

Subject 2 was a pre-teen boy who was included in the sample as his speed of memorization was above average and he completed the memorization of the Quran in 1 year and 10 months. Subjects 3 and 4 were girls in their late teens, and they were considered average students based on their duration of completing memorization.

Teacher 1 was a highly educated person in the religious and general education fields with a PhD in Urdu language from a central university. Data was collected from him by utilizing the teachers' section of the interview schedule. Teachers 2 and 3 were included as they were teaching in modern seminaries that were trying to integrate general education within their respective seminaries.

Teacher 4, with the highest degrees in religious education was the principal of the seminary in which I had taken admission for my participant observation. Subjects 5, 6, 7, and 8 were Teacher 4's children and all were below 10 years of age. Subject 5 completed her

memorization at the age of 9 years and 3 months. And Subject 9, a girl in her early twenties in my participant observation seminary, took more than 4 years to memorize and her speed was considered below average.

I tried to cover a range of students, teachers and seminaries in my sample to generate a comprehensive understanding of memorization and include its various aspects from my sample.

Ethical Issues

Our university does not have an IRB as social sciences research is considered exempt from IRB approval. However, departmental research committee, the DRC, reviews the research process at three important points: the first review seminar is about the research methodology that the research scholar has chosen, rationale for it, proposed sampling, data collection and data analyses procedures; the second seminar is given after data is collected and analyzed; and the third and final seminar is given after the research findings are elaborated in the form of discussion.

In spite of the above exemption, my research supervisor insisted that I should obtain informed consent from all the adult subjects, and in the case of children, from their parent/teacher (Zahle, 2017). So, I had designed an informed consent form with information sheet containing the aims of my research, confidentiality of the data generated, anonymity of the participants and their institutions, and a consent form in which the permission of the subjects is solicited and obtained to participate in the research. Further, it included potential benefits and risks in which former included contributing to research about memorization and no risks for the participants. I explained the contents of the form to the participant, and they completed and signed the consent forms as evidence of their voluntary participation in the study.

Analytic Tools

Corbin and Strauss (2008, cited in Bertagno, 2016) recommended the benefits of implementing different research strategies called "analytic tools" to establish the empirical validity of their research, and I had used them to facilitate the research, coding and writing processes.

The Use of Questioning

The interview schedule was used flexibly to ask questions with the principal intention of eliciting information in rich detail, while at the same time the subjects were allowed the time and scope to elaborate on the responses with multiple examples. For instance, Subject 1 who was a retired head mistress of a school demonstrated her method of memorizing by showing her copy of the Quran, and the step-by-step method she follows. Multiple instances of the same processes of memorization were studied for confirmation and elaboration of details from all the subjects.

Constant Comparison

I had used both the suggested techniques of comparisons which are comparing incident by incident; and theoretical comparison in which I compared incidents, their processes, dimensions, and outcomes with accepted theories in relevant domains. The comparative process continued until they reached saturation when there were no new ideas and insights

emerging from the data and there was repetition in the themes that were already observed and recorded.

Memo Writing

Memos were invaluable to identify distinct clusters of behaviors and to link them with conceptual categories, to establish the relationships between them to construct axial code categories and sub-code categories and to shape the grounded theory. Memos helped to summarize the concepts included in the axial codes and formed the basis of the chapter "Discussion" (Bryant, 2019). When writing memos about the unfamiliar domain of memorization of the Quran, I was conscious of and made explicit the assumptions inherent in the psychological theories embedded in the culture of western societies, and which I also subscribe to due to my educational background. I tried to define and explain the memorization, and its behavioural processes as they would be defined by the participants themselves (Spradley, 2016). During the process of writing memos, relevant research literature (Charmaz, 2006) from different domains provided secondary data that gave focus and helped to make sense of the primary data by comparisons and identification of confirmatory and non-confirmatory evidence. The approach I had adopted was to write memos that noted the points of convergence between the extant models, and also capture the points of divergence vis-a-vis the generated data through the constant comparison method**.** As more concepts and categories emerged from the study, the memos were revisited and updated accordingly.

Theoretical Sufficiency

Theoretical sufficiency (Dey, 1999) was adopted during the data collection process because lesser number of new codes were added as data collection and analyses progressed and the data was becoming repetitive.

Data Coding and Analyses

Being "grounded" (Timonen et al., 2018) helped me at every step of research and it helped me to be patient, empirical and authentic: by searching and sifting as many behavioural evidences as possible through multiple data sources, linking behavioural evidence with nascent codes and categories at the next level of abstraction, and confirming the emergent codes and categories with converging evidences respectively, during the data generation and coding it many times, especially for the data from S1 and S2. As constant comparison progressed from S3 onwards, my flailing gradually gave way to tentative categories. Further literature review was a continual process of exploring and discovering, and it aided in abduction (Timonen), in formulating possible explanations for the patterns of behaviours, and for establishing categories with clearer structural boundaries of which open codes to include in them and which ones to exclude. Data was the touchstone that "grounded" the generation, coding and analyses at each point in the research process I was conscious that I should offer both insight and coherence (Bryant, 2019) in the process of creating codes as I was collecting information in a different language and translating it into English, and I clarified and cross-checked the codes many times to avoid force-fitting the data into conceptual categories by imposing my preconceptions from my psychology background.

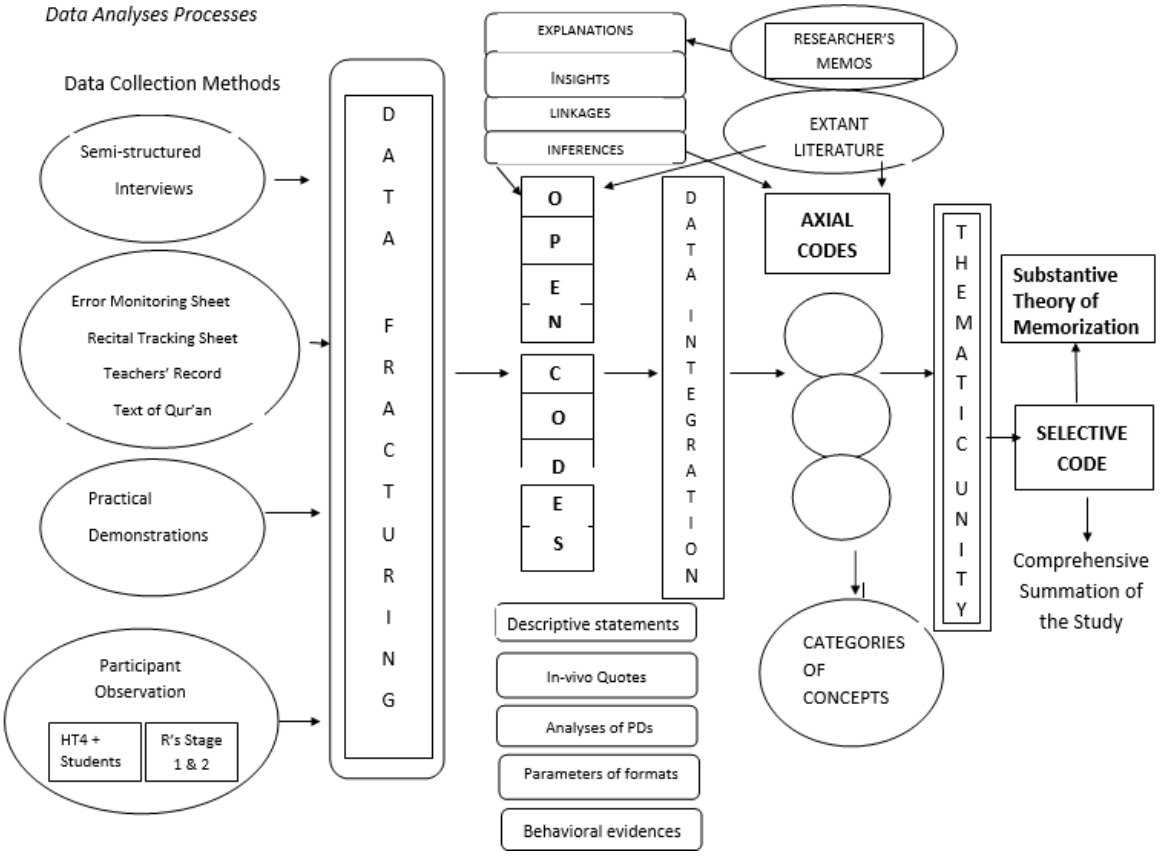
Data Coding and Analyses: An Overview

a. Open coding of each student subject individually

b. Axial coding of each student subject
c. Data integration of the axial codes of student subjects of the sample group, repetitions deleted, axial codes streamlined
d. Tentative selective code
e. Steps a, b, c, and d were repeated for sample groups of teachers and participant observation.
f. Axial codes of all three sample groups tabulated for comparison
g. Axial codes common to two or more sample groups are integrated and those specific to one group are retained separately
h. Selective code finalized with axial codes inputs of all three sample groups
i. Grounding of the substantive theory of memorization of the Quran
j. Memos and references were integrated with the chapter on "Discussion"

Figure 1.

Data Analyses Processes



Open Coding

As a first step in the coding and analysis, I read all interview transcripts to immerse myself in the data. All the data that was generated through the semi-structured interviews utilizing the interview schedule, the practical demonstrations, and field notes of participant observation data was fragmented into logical units. Formats of the documents that are utilized to capture data during the memorization process were also analyzed. Each open code expresses a particular concept and its facets, its implementation in the instructional system, behavioural evidence illustrating cognitive processes, methods of assessing, collecting data and giving feedback to the students during the three stages of memorization. Open codes also included "in-vivo" quotes of the students and the teachers, summations of practical demonstrations, and inputs from the documentation generated during memorization. This process created a number of open codes which were presented in the form of concise and descriptive statements. During

the process of open coding, I made a number of "constant comparisons" (Strauss & Corbin, 1994) comparing the open codes with each other, and the subjects with each other, with the extant research literature, theories and models. These constant comparisons generated the "memo" (Strauss & Corbin) and cross references that added valuable inputs to the "discussion" of the research outcomes.

The written records of the interviews with the subjects were analyzed, along with other data including their in-vivo quotes, the practical demonstrations, the parameters in the formats of the error-monitoring sheet and recital tracking sheet, participant observation data that was captured in the two documents I had maintained. Three discrete clusters of open codes were created from the three sample groups: the students, the teachers, and the participant observation data. There was an aggregate of about 366 open codes, which are discrete facets of a specific phenomenon. They are presented in the form of short descriptive statements, in-vivo quotes made by the subjects, summaries of practical demonstrations.

Some of the open codes are applicable in more than one axial code, i.e., the behavioural evidence or other information given by the subjects can be subsumed under more than one category. Therefore, when a specific open code is interpreted within the context of an axial code, its behavioural evidence and supportive information is interpreted and presented within its specific context. The open codes are arranged with the most general factors at the top of the axial code table followed by specific information applicable to each of the subjects. The open codes related to personal information in the axial code category "personal and cultural factors" are developed into brief case summaries.

Axial Coding

The large number of open codes that were generated at the conclusion of the open coding process was integrated into logical groupings around a central axis. These axial codes formed definite categories.

Bryant (2019) points that grounded theorizing requiring trial and error during conceptualization of open codes and categories was reflected during my coding of the data from S1 and S2 in which I generated open codes and axial codes about three to four times. Coding for data from other subjects was more focussed, but by no means could it be slotted and labelled neatly. I went through multiple iterations of building sub-codes within axial codes, combining some and deleting others, for instance some behavioural evidence was categorised into multiple subcodes and axial codes depending on whether the perspective of the students or their teachers was taking precedence in a specific axial code. Since I was collecting data from both the primary stakeholders in the memorization, (i.e., the students and the teachers) I segregated the data into different categories, and I was guided by the pragmatic concern to capture as much data as possible and develop a well-rounded conceptualisation of memorization. Axial codes were created for each of the subjects of each group separately. Then the axial codes of each subject were compared with axial codes of the other subjects in the same group. And this comparison resulted in the process of data integration and generation of three integrated sets of axial codes for each of the three clusters of data. During this comparative process, redundant open codes were eliminated, common open codes were identified, and specific open codes related to a particular subject were identified. A coherent structure of an axial code emerged that defined its implementation and behavioural evidence during the learning processes of the memorization. Some of the behavioural evidence and systems were relevant to more than one axial code, and therefore they were interpreted within the parameters of their specific axial code.

Further, constant comparison (Strauss & Corbin, 1994) of axial codes of all the three groups ascertained that some were common to all the three groups, but few other axial codes

were specific to a particular group. There were 11 axial code categories, which is a well-defined theme with multiple facets. Some of the common axial codes were composed of specific open codes that were relevant to the particular sample, e.g., axial code instructional methodology which is common to all the three sample groups has open codes from each of the respondents' perspective. Axial code categories 10 and 11 are about two modern seminaries trying to integrate general education with memorization of the Quran.

Selective Coding

All the axial code categories of the three groups were aggregated to express the central theme which had emerged from the data in this third and final step of the data analyses. Selective code is the crux of the research project which assimilates all the axial codes into an integrated explanation. It was presented in the form of a comprehensive statement that sums up the research findings and explains them cogently. It provides structural boundaries that encompass all the axial codes which illuminate various facets of the topic of research.

Grounding the Theory

As I collected and analysed data through interviews and clarified it with data from participant observations and practical demonstrations, I identified that some themes were recurring which coalesced into axial codes, and all of them dovetailed into the selective code. At this point, I stalled again, and another round of rereading and comparison of data with the axial codes and selective code ensued, at which point I realized that my grounded theory of memorization was stabilizing (Charmaz, 2014). In GT terminology, I had generated a substantive grounded theory as it is based on research on a specific area (Strauss & Corbin, 1994), and it might not be generalizable to other domains. The grounded theory of memorization was composed of four interlocking propositions that captured the objectives of memorization, and its three performance outputs. I was still chary of calling it "theory", but what infused me with confidence was that I had the data to support all the propositions.

Data Display Methods

I utilized different methods extensively to communicate my research findings which are intended to present the vast amount of data in a coherent manner; create a cognitive map to navigate; appreciate the interrelationships between the different axial code categories and the selective code and propose a substantive theory of memorization of the Quran. Tables and matrices were built from the outputs of axial and selective coding stages, to detail open codes and sub-codes belonging to each of the axial code categories that were given as brief descriptive statements. Diagrams and flowcharts were used to visually display axial codes, to explain the main factors, the flow of action in the sequence in which it had occurred, and the outcomes. In-vivo quotes of the subjects were included (Bryant, 2019), for instance to validate their cognitive processes during the process of primary memorization. The subjects' personal, familial, and socio-economic factors were given in the form of case summaries.

Methods of Implementing Evaluative Criteria

Creswell (1998 cited in Cohen & Crabtree, 2006) recommends spending extensive time in the field to develop understanding, and he identifies eight procedures for verifying qualitative research findings and recommends that any research study employ at least two of these procedures. I have employed five of the procedures recommended: prolonged

engagement and persistent observation, triangulation, audit trail, reflexivity, and rich, thick description.

Triangulation

I have utilized three types of triangulations (Cohen & Crabtree, 2006) in this research study, namely methods triangulation, triangulation of sources and theory/perspective triangulation through the means described below:

Methods triangulation: I have used multiple methods for data collection including semi-structured interviews, practical demonstrations, and participant observation to generate primary data in order to check the consistency of findings.

Triangulation of sources: I had used the above-mentioned methods with multiple subjects including students and teachers to examine the consistency of different data sources from within the same method, and the possible interpretations that could be drawn from it.

Theory/perspective triangulation: I had utilized theoretical literature from a range of domains including skilled memory theory, long-term working memory, superior memory, reading expertise and instructional science frameworks to examine and interpret the data.

Audit Trail

I have tried to create and report my audit trail by a clear description of my research path. I have included the rationale and details about the development of the research process, data collection decisions, and the methods to analyze and report data, and information about sampling decisions. The audit trail of this research study can be tracked in the following documents and my actions.

- Inquiry proposal in which I had conceptualized the research project as a quantitative and qualitative study.
- Subsequent interactions with various stakeholders in the field including students and teachers in a seminary, and professors in cognitive psychology and Arabic captured in the pre-data stage and as a result of the methodology literature review, re-orienting the research study as a "grounded theory" project.
- Annual reports that track the progress of the research study.
- Information about the interview schedule development and formats for students and teachers, both in English and Urdu.
- Raw data of subjects generated by utilizing the interview schedule and the subsequent data coding documents.
- Copies of blank formats of documents used by students during the memorization process, translated into English from Urdu.
- Participant observation field notes captured in two documents including my diary of learning and data gathered from other students in the participant observation setting, and subsequent data coding of the same.
- Memo writing used during literature review, the processes of open coding and axial coding, and subsequently during the report writing of discussion phase.
- Extended literature review and a final report that included connections to extant research literatures and identifying the similarities and dissimilarities with the established concepts, models, and interpretations.

- Short description of cases including students, teachers, and members in the participant observation setting.
- Reconstruction of data and results of syntheses in the form of descriptive statements for open code statements and axial code categories presented in the form of tables in the chapter on "Data Analyses."

Prolonged Engagement and Persistent Observation

Spending sufficient time in the field with the research topic and subjects to learn and understand the culture, social setting, or phenomenon of interest is prolonged engagement (Mays & Pope, 2000, in Cohen & Crabtree, 2006) and one of the hallmarks of authenticity in qualitative research.

As a participant observer, I was engaged in the setting of the seminary for over 2 years, and I was able to put aside my preconceptions and to understand the socio-cultural aspects of the situation so that the context is appreciated and understood. I learnt their technical terminology and could appreciate their references. I began to blend in, respondents felt comfortable in disclosing information and I could rise above my own preconceptions.

I engaged in persistent observation by repeatedly engaging with the subjects in my study, verifying the tentative findings with multiple instances of the same phenomenon, for instance: the importance of forming an analogous image of the page that is memorized and its contribution to memory strengthening.

Reflexivity

To support reflexivity, I used varying methods to identify, minimize and eliminate potential researcher bias. I followed the practice of writing memos right from the initial stages of literature review, data collection and analysis. The review of literature and collection of data and its coding were iterative processes and the inputs from one informed the other. Further, the use of the constant comparative method allowed me to stay open to new insights during the analysis and consider alternative interpretations (Corbin & Strauss, 2008). During the process of literature review I would follow the constant comparison method and wrote memos to capture the similarities and discrepancies in various domains and the data that was analyzed. Later reading clarified the earlier memos and helped to contextualize them and this process resulted in sharpening the focus of the research. For instance, Chase and Ericsson (1980) identified three principles of skilled memory. The first two principles are supported by the memorization of the Quran but the third one is contradictory to it.

Some interesting aspects were discovered during data collection and analysis phase, not during the construction of the interview schedule. Some of these issue that were discovered and added later include the acceleration of memorization for all subjects as they progressed, how the chapter 55 of the Quran was memorized and retrieved as one particular verse in this chapter is repeated over 30 times.

These additions during the data collection show that I had sensitivity to the research issue and kept an open mind throughout the process of interviews and data analysis. It establishes the authenticity of the research process and supports my reflexivity.

Continuous communication with the research supervisor at all stages of the study including research design, construction and vetting of the interview schedule, data collection methods, coding and analysis, interpretation and results syntheses, data display methods for lucidity in communicating the research outcomes and writing the report also enhanced reflexivity of the research process. The process of supervision helped me to reflect upon

potential biases and acknowledge some preconceptions at each stage of the research process, particularly as this area of research is closely related to my interest and cultural practices.

Thick Description

I have utilized rich, thick description in which I had captured, questioned and clarified, confirmed and written about all the details of the phenomenon under study with the clear understanding that this domain is unfamiliar to many reviewers and readers and it is my responsibility to contextualize the information in rich detailed descriptions; and narratives that illuminate the actions, outcomes, perspectives and supportive conditions of the participants. I have tried to present objective facts with supportive evidence, in-vivo extracts, and examples of practical demonstrations.

Conclusion

The grounded theory methodology was an invaluable framework with its combination of structured freedom and openness to utilize multiple methods to generate a comprehensive understanding of the memorization process of the Quran. This article has explained the details of the research processes, its salient features, data collection methods, data analyses steps, sampling, and the types of evaluative criteria and methods of implementing them during the research process.

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