

A Study on Primary Teachers' Pedagogical Content Knowledge and Its Relationship with Students' Coping Strategies

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ABSTRACT

Although a large part of the literature has focused on the importance of teachers' pedagogical content knowledge, the nature of its relationship with students' coping strategies has not been explored adequately, especially in the case of mathematics. The study uses a framework which combines aspects of the self (cognitive: stressful events, coping strategies) and the social (pedagogy: teachers' pedagogical content knowledge). Data were collected by interviewing a cohort of future primary teachers about their experiences when they were pupils. The analysis followed a qualitative text analysis approach. Our data suggest that when teachers are not equipped with the needed pedagogical knowledge for teaching a challenging subject such as mathematics, they may create stressful and developmentally detrimental learning paths for their students. We conclude by suggesting that curricula for primary teachers should be structured as learning communities which incorporate the affective dimension of learning.

Keywords: primary teachers, pedagogical content knowledge, content knowledge, coping strategies, primary mathematics education

INTRODUCTION

Freeman (2002) argues that "teacher learning" should be the core of any activity of any teacher preparation program. As a process it involves two main components that are socio-cognitive in nature: developmental processes aiming at educating teachers how to teach and;

epistemologically oriented processes that pertain to the knowledge teachers should have obtained at the end of their education. Among the most influential conceptualisations of a teacher's knowledge, is Shulman's notion of pedagogical content knowledge, a framework which has equipped researchers and practitioners with a particularly useful tool for studying this "special kind of knowledge" that is particularly important in the teaching profession and should inform curricula of training programs for teachers. Shulman (1986; 1987; 1998) distinguishes seven major categories of teacher knowledge: general pedagogical knowledge, knowledge of learners, knowledge of educational contexts, knowledge of educational values, content knowledge, curriculum knowledge and pedagogical content knowledge. General pedagogical knowledge relates to general principles and strategies that a teacher can use for managing and maintaining classroom control and surpasses the subject that is taught i.e., it does not relate to a specific scientific domain. Knowledge of learners pertains to a teacher's understanding of how students learn and their characteristics, whereas knowledge of educational contexts refers to knowing how to work in groups, with the whole classroom or even at the level of a community. Knowledge of educational values concerns a teacher's understanding of the means,

purposes and their philosophical grounds. Content knowledge pertains to the knowledge of the subject that is taught (e.g., mathematics) and curricular knowledge includes a teacher's understanding of the materials and programs defining a subject's curriculum. Finally, pedagogical content knowledge entails an amalgamation of content knowledge and pedagogical knowledge, knowledge that includes a subject's "most regularly taught topics in one's subject area, the most useful forms of representation of those ideas, the most powerful analogies, illustrations, examples, explanations, and demonstrations" (Shulman, 1986, p.9). Shulman (1986) argues that content knowledge, curriculum knowledge and pedagogical content knowledge constitute comprise "a blind spot with respect to content that characterizes most research on teaching, and as a consequence, most of our state-level programs of teacher evaluation and teacher certification" (pp.7-8).

Shulman's framework alongside some modified versions of it such as Ball et al.'s (2008) version of mathematical knowledge for teaching have been extensively used in the literature. In primary education, pedagogical content knowledge and mathematical knowledge for teaching have been used to mainly investigate future teachers' misconceptions and difficulties with addition and subtraction, fractions, decimal numbers, proportional reasoning, percentages, problem solving, word problems and functions; typically, these studies use instruments such as tests, questionnaires lesson observations and document analysis in order to access and evaluate prospective teachers' knowledge in these areas (Depaepe et al., 2013). Besides the above mathematical subdomains, pedagogical content knowledge and other approaches (e.g., mathematical knowledge for teaching) have been used to study six main areas of research (*Ibid.*): (a) the nature of pedagogical content knowledge; (b) the relationship between pedagogical content knowledge and content knowledge; (c) the

relationship between pedagogical content knowledge and instructional practices; (d) the relationship between pedagogical content knowledge and students' learning outcomes; (e) the relationship between pedagogical content knowledge and personal characteristics, and; (f) the development of pedagogical content knowledge.

Of particular interest to us is the third area which includes studies focussing on the relationship of pre- and/or in-service teachers' pedagogical content knowledge and teaching behaviour. According to Depaepe et al.'s (2013) review, studies in this groups demonstrate that: (1) pedagogical content knowledge is associated with a teacher's instructional practice; (2) good pedagogical content knowledge as well as content knowledge is essential for effective instruction; (3) teaching quality is significantly more related to pedagogical content knowledge than content knowledge and; (4) specially designed courses for prospective teachers not only enhance their pedagogical content knowledge and content knowledge but also their teaching practice and their students' learning outcomes.

Various studies in primary settings have revealed that mathematics anxiety is directly linked with stressful school life events people have experienced during their childhood. Studies focussing on such issues have revealed that teachers can indeed create mathematics anxiety and alter the quality of a student's learning. Some studies have underlined various aspects of a teacher's behaviour and pedagogical approach such as: being hostile, showing signs of gender bias, providing poor explanations, assuming knowledge of previous material, being authoritarian, lacking class management skills or being inadequate (Bekdemir, 2010; Jackson & Leffingwell, 1999).

An important dimension of this part of the literature are theoretical and empirical investigations concerning of coping styles i.e., the ways in which a person can handle

and deal with stressful events. The classifications of coping strategies are several but arguably those by Lazarus and Folkman (1984) and Carver, Scheier and Weintraub (1989) have a wide use. Lazarus and Folkman (1984) classified coping strategies into problem focused coping and emotion focused coping. In problem focused coping, the individual believes that he/she can solve the problem and has or may develop approaches for that, like planning. Problem focused coping includes strategies such as active coping, active planning, and suppression of competing activities; restrain coping and seeking social support. In emotion focused coping, the individual does not address the problem but rather tries to manage the (often) overwhelming emotions associated with an issue. Emotion focused coping incorporates strategies such as denial, focusing on and venting of emotions, positive reinterpretation of events, seeking social support, minimizing threat, wishful thinking, and self-blame. Carver et al., (1989) and Carver (1997) classified coping strategies in a similar manner and distinguished between problem focused coping (active coping, active planning, suppression of competing activities, restrain coping and seeking social support), emotion focused coping (seeking social support for emotional reasons, positive reframing, acceptance, denial) and less useful strategies (venting of emotions, behavioural and mental disengagement, self-blame). In the transactional model of stress, coping responses are the key to preventing the stress response. In general, the existing taxonomies view coping styles as falling into one of the following categories: (a) problem-focused coping, directed at solving the problem; (b) emotion-focused coping facilitating the individual's emotional response and alleviating negative emotion generation and (c) avoidance-focused coping involving trials to remove oneself mentally from stress inducing situations. These three types of coping strategies have been found to moderate stressful experiences. Recently a fourth group of

strategies was added by Folkman and Moskowitz (2007), the meaning-focused coping which refer to appraisal-based on beliefs, values and goals.

In Brougham's et. al. (2009) work it's evident that the use of emotion-focused coping strategies was more often used than the problem-solving strategies when facing with various stresses such as academic, family or even daily hassles. Other causes of stress could be time pressure, no motivation, and difficult assignments. Babar et. al. (2004) found that the most important stress inducing events for students are the professors and the exams. If stress levels are high academic performance is deteriorating and negatively affected the quality of student learning (Lumley and Provenzano, 2003). In cases like that coping mechanism such as the social support network from family and friends could ameliorate the side effects of stress (Campbell & Svenson, 1992; Ganesan, et. al., 2018). Coping strategies are used in all stages of life (childhood, adolescence, young adulthood and adulthood) and offer a balanced way to attend stressful situations, especially in learning environments (Campbell and Svenson, 1992).

Given the importance that is assigned to teachers' pedagogical content knowledge and the strong links between a teacher's pedagogy and mathematics anxiety, it is reasonable to assume that students experiencing in-class stressful events will develop techniques and approaches (i.e., coping strategies) in dealing with these situations. However, studies examining the relation between pedagogical knowledge and coping strategies are currently very limited. Thus, in this study's purpose we ask:

1. How do characteristics of a teacher's pedagogical approach and negative events experienced by primary students relate?
2. How do students' coping strategies relate to a teacher's pedagogical approach?

MATERIALS & METHODS

The research reported here took place in a Primary Education Department. The degree's duration is four years (approximately 70 modules) and includes modules related to educational psychology, educational technology, STEM education, teaching methodology as well as theoretical aspects of education and curricula. Undergraduates in their last year of studies have their practicum over a period of two semesters.

The study followed a multiple-case study design (Yin, 2018) and in total 24 future primary teachers participated (average age = 21.2 years, 92% female). All data collection procedures started after receiving approval from the University's Ethics Committee (approval decision number: 27/24.02.2022). Data were collected by interviewing participants. The interviews were semi-structured and lasted for 40 minutes on average. The protocol was comprised of open-ended questions focussing on in-class events and coping strategies used. Each participant was fully informed about the nature, purpose and intended uses of the study. During each interview we emphasised to participants the voluntary, anonymous and confidential nature of their involvement. Before conducting the interviews, all participants signed a consent form following the Declaration of Helsinki. All interviews were fully transcribed and anonymised. Qualitative text analysis was used as the method for analysing the data. The procedure involved the following steps (Kuckartz, 2014): familiarisation with the data, identification of the main thematic categories, initial coding by both authors independently, creation of a common coding frame after reaching a consensus, creation of thematic subcategories, final analysis by following a category-based strategy.

FINDINGS

In the data, we identified links between a teacher's general pedagogical knowledge and pedagogical content knowledge and the coping strategies employed by students.

This was accomplished by making associations between a teacher's in-class practice, the stress inducing events experienced by students and the coping strategies employed in counterbalancing the effects of these events.

The episodes reported by participants were linked to various aspects of a teacher's pedagogy as described in Shulman's (1986; 1987; 1998) work: general pedagogical knowledge, knowledge of learner's and their characteristics, knowledge of educational contexts, knowledge of educational values, content knowledge, curriculum knowledge and pedagogical content knowledge. Some episodes did not fit into these categories and were linked to a teacher's in-class behaviour, not particularly associated with the above categories.

The coping strategies employed by students were categorised according to the conceptualisations of Carver et al., (1989), Carver (1997) and Lazarus and Folkman (1984) who have proposed 12 distinct types of coping strategies: active coping, planning, instrumental support, denial, acceptance, emotional support, positive reframing, mixed support, behavioural disengagement, venting and self-blame.

In terms of a teacher's pedagogy, most of the identified episodes were associated with an educator's general pedagogical knowledge, pedagogical content knowledge and content knowledge of mathematics. These episodes were particularly dramatic and pertained to teaching methods and techniques used while teaching mathematics. In these cases, a teacher's pedagogy was expressed through acts of punishment, embarrassment, hostility and anger towards a student. The following account is a representative example of a teacher's actions:

...we had a teacher somewhere in the fourth/fifth/sixth grade, sometime around then, I can't remember now exactly... which I think... this is when I kind of lost it, because she didn't treat us nicely during our mathematics lessons... to pupils not understanding mathematics... she would

invite them on the blackboard in order to solve exercises in front of the class... (Student 6)

An important dimension identified in the data relates to a teacher's competency in mathematics, i.e., his/her content knowledge of mathematics. Some episodes associated with this aspect included in-class subtle events which were interpreted by a student as a manifestation of a teacher's inadequacy in mathematics. Other episodes were more explicit and involved students or members of their family becoming aware of a teacher's inability to adequately teach mathematics. The following excerpt is a case in point:

she made mistakes in the exercises... many times some things were... my parents saw that she was teaching us in a wrong way... my mother in particular... (Student 24)

In relation to the coping strategies students employed in compensating for the stress and negative emotions generated while experiencing the above events, we identified eight different approaches: acceptance, active coping, behavioural disengagement, emotional support, instrumental support, self-blame, venting and mixed support. Of them, the most frequently used coping strategies included behavioural disengagement, venting of emotions, instrumental support and active coping.

Participants who reported becoming behaviourally disengaged as means for coping with a stressful event, used vivid narratives in describing their experiences. All of them included expressions of disappointment, defeat, failure and a perception of being unable to act. The following excerpt describes such a vivid account:

...the teachers were trying to help me without any result and success because... [...] they were trying to help me but the truth is they were tired of dealing with me... [...] I couldn't deal [with it], I told myself I'm not good at mathematics [...] (Student 23)

Other students tried to deal with their negative experiences by venting their

emotions to others. Their accounts included incidents of being upset, criticising and disapproving their teacher's actions or their studying approach in graphical manner. The excerpt below is characteristic of how students using this strategy tried to cope with their stress:

...from the fifth grade on, everyone was telling me it is a hard grade... [...] Because I remember trying really hard with mathematics and all the time, I was doing mistakes [when solving exercises] and I remember myself saying "what went wrong again?" [irritated] (Student 13)

Students seeking for instrumental support used a more active approach in dealing with the issues resulting from their teacher's pedagogical approach. Participants who reported employing this strategy, reported seeking help or advice from people that were close to them, especially their parents. The following extract demonstrates the nature of this kind of coping strategy; it involves a student seeking for support from her mother for dealing with the pressure she was experiencing due to her inability to deal with mathematics:

...my mother told me that she could get me a private tutor to help me... I wasn't sure if I indeed was in need for private lessons... [...] Eventually, during the fifth grade I did some private lessons... (Student 22)

Finally, participants who tried to seek ways in actively coping with the stress induced by their teacher's approach, reported taking steps and certain measures in order to try and solve their issues. The excerpt below involves a student's actions in actively counterbalancing her teacher's hostility towards students not being able to understand mathematics:

Initially I tried to deal with it, I was trying as hard as I could... studying on my own at home, seeking for new ways to explain stuff to myself in order to be able to understand [mathematics] and to progress, to become good at it... (Student 6)

Students who experienced episodes related to their teacher's lack of content knowledge of mathematics, reported employing mostly

problem focused strategies such as seeking for instrumental support or active coping. For example, in the case of student 24 who realised that his teacher was inadequate in teaching mathematics (because she was doing a lot of mistakes) this was done by hiring a private tutor:

...so, because my mother couldn't help me, we turned to a private tutor... because the teacher couldn't... she was practically unable, it was very difficult for her [the teacher] to handle this... (Student 24)

In cases where an episode was associated with a teacher's pedagogy, most of the students employed an emotion focused strategy. For instance, student 6 felt several times embarrassed due to her teacher's approach that was mistreating pupils "not understanding mathematics". In order to cope with such episodes, the student employed mostly venting of emotions and behavioural disengagement coping strategies:

...I think since that time I had issues... Although when at home I was able to understand mathematics, and... although I was doing well in tests, I had a fear... that... we have now our mathematics class... and I just wanted to disappear... (Student 6)

Other students became behaviourally disengaged from the act of learning mathematics. This was evident in the case of student 23 who tried to deal with her teacher's inability to properly motivate her to participate in class discussions; eventually the student accepted her "inability" to do mathematics, gave up and distanced herself from the rest of the class community:

[...] I couldn't deal [with it], I told myself I'm not good at mathematics, that my teachers are tired of dealing with me and... and I too stopped dealing with mathematics too, telling myself that I'm not good... (Student 23)

DISCUSSION AND CONCLUSION

The main purpose of the study was to investigate the relationship between (a) teachers' pedagogy and primary students'

negative events and, (b) teachers' pedagogy and primary students' coping strategies. The negative events identified in our data included acts of punishment, embarrassment, hostility and anger towards a student or a teacher's inability to adequately teach mathematics. These episodes were mainly linked to a teacher's general pedagogical knowledge, pedagogical content knowledge and content knowledge of mathematics. The study provides some interesting findings with regards to the relationship between coping strategies and educational practices in young populations. When trying to compensate for the negative effects of the above-mentioned events, participants reported using two main coping strategies: becoming behaviourally disengaged with the class community or any activity oriented towards learning mathematics and, seeking for instrumental support from their environment.

The methods and sample used in this research highlight our focus and the importance we place on improving, enhancing and complementing our knowledge of the teaching profession by better preparing future primary teachers. Overall, our data suggest that when teachers are not appropriately equipped with the needed pedagogical knowledge for teaching a challenging subject such as mathematics, they may create stressful and developmentally detrimental learning paths for their students. A significant number of empirical studies have highlighted this observation (e.g., Bekdemir, 2010; Jackson & Leffingwell, 1999) and many authors have stated that mathematics anxiety is a form of anxiety created by primary teachers and the pedagogical choices they made (e.g., Frank, 1990; Harper & Daane, 1998; Perry, 2004).

However, previous research hasn't made connections between a number of important dimensions. First, studies in the area have focussed on either the cognitive dimension (i.e., studies exploring mathematics anxiety in relation to the coping strategies used) or

solely on the pedagogical processes taking place in primary classrooms (i.e., teachers' pedagogical content knowledge) but not both. In our study we used an integrated framework combining the above paradigms; by doing so, we were able to draw lines between the self (stressful events, coping strategies) and the social (pedagogical content knowledge, classroom environment). Second, previous research hasn't emphasised adequately the major role that the above cognitive and pedagogical processes play in shaping future teachers' orientation towards mathematics or their subsequent pedagogy as future educators. As already presented, in our data we were able to identify instances of fear, avoidance and disengagement with the actual act of learning mathematics; these behaviours were also identified in a significant number of participants during their practicum while teaching mathematics: during these episodes, students were either experiencing high levels of stress while preparing to teach or they were unable to teach due to their state of mind after reviving events from their primary years (Vasilaki & Anastasakis, 2023).

In our study it became apparent that contemporary courses for training primary teachers need to take into account undergraduates past experiences as pupils, especially in the case of mathematics. This is an aspect not prominent in the current literature or the discussions for designing/reforming curricula for future primary teachers. The cognitive component of our approach highlighted that if prospective teachers did not have the capacity or access to appropriate resources and support in choosing the most beneficial for them coping strategy, they might not be able to do so in an academic environment full of expectations and characterised by a rather fast pace. Consequently, the pedagogical component of our approach underlined a need for identifying and acknowledging prospective teachers' exposure in pedagogical practices harmful to them.

So how can primary education departments materialise this study's main conclusions? In our view, training courses for future primary teachers should be redefined and redesigned on the basis that learning is a developmental process (Vygotsky, 2019) which benefits the learner when she/he is considered an active member of a community, a learning community (Smith, 2001). This can take the form of a community of practice (Wenger, 1999), a professional learning community (Reason, 1998) or a peer learning community (Heron, 1974, cited in Jarvis 2006). What is particularly important in relation to this study's results is a feature of peer learning communities, that of offering a holistic education. As Jarvis (2006) notes, the philosophy of a programme should concern the education of the whole person (mind, body and spirit), with a particular emphasis on the affective domain. Jarvis (2006) argues that most training programmes do not take at all this dimension into account (despite being an important component of learning) and suggests the use of events as a potential source of learning. This is exactly what our study highlighted through the cases of students who had experienced particularly stressful events and we also suggest: the incorporation of emotion focussed, stress reduction workshops which strengthen the existing adaptive emotion-focused strategies of future primary teachers.

Declaration by Authors

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REFERENCES

1. Babar T. Shaikh, Arsalan Kahloon, Muhammad Kazmi, Hamza Khalid, Kiran Nawaz, Nadia A. Saadiya Khan (2004). Students, Stress and Coping Strategies: A Case of Pakistani Medical School. *Education for Health*, Vol. 17, No. 3. Taylor & Francis

2. Ball, D., Thames, M. H., & Phelps, G. (2008). Content Knowledge for Teaching: What Makes It Special? *Journal of Teacher Education*, 59(5), 389-407. <https://doi.org/10.1177/0022487108324554>
3. Bekdemir, M. (2010). The pre-service teachers' mathematics anxiety related to depth of negative experiences in mathematics classroom while they were students. *Educational Studies in Mathematics*, 75(3), 311-328. doi:10.1007/s10649-010-9260-7
4. Brougham, R.R., Zail, C.M., Mendoza, C.M. et al. Stress, Sex Differences, and Coping Strategies Among College Students. *Curr Psychol* 28, 85–97 (2009). <https://doi.org/10.1007/s12144-009-9047-0>
5. Campbell, R. L., Svenson, L. W., & Jarvis, G. K. (1992). Perceived Level of Stress among University Undergraduate Students in Edmonton, Canada. *Perceptual and Motor Skills*, 75(2), 552–554. <https://doi.org/10.2466/pms.1992.75.2.552>
6. Carver, C. S., Scheier, M. F., & Weintraub, J. K. (1989). Assessing coping strategies: a theoretically based approach. *Journal of personality and social psychology*, 56(2), 267. <https://doi.org/10.1037/0022-3514.56.2.267>
7. Carver, C. S. (1997). You want to measure coping but your protocol's too long: Consider the brief cope. *International journal of behavioral medicine*, 4(1), 92-100. Retrieved from https://link.springer.com/article/10.1207/s15327558ijbm0401_6
8. Depaepe, F., Verschaffel, L., & Kelchtermans, G. (2013). Pedagogical content knowledge: A systematic review of the way in which the concept has pervaded mathematics educational research. *Teaching and Teacher Education*, 34, 12-25. doi:10.1016/j.tate.2013.03.001
9. Folkman, S., & Moskowitz, J. T. (2007). Positive affect and meaning-focused coping during significant psychological stress. In *The Scope of Social Psychology: Theory and Applications* (pp. 193-208). Psychology Press Taylor & Francis Group. <https://doi.org/10.4324/9780203965245>
10. Frank, M. L. (1990). What myths about mathematics are held and conveyed by teachers? *Arithmetic Teacher*, 37(5), 10–12.
11. Freeman, D. (2002). The hidden side of the work: Teacher knowledge and learning to teach. A perspective from north American educational research on teacher education in English language teaching. *Language Teaching*, 35(01). doi:10.1017/s0261444801001720
12. Ganesan Y., Talwar P., Norsiah Fauzan, Oon, Y.B. (2018). A Study on Stress Level and Coping Strategies among Undergraduate Students, *Cognitive Sciences and Human Development*, vol. 3, No., 2
13. Harper, N. W., & Daane, C. J. (1998). Causes and reduction of mathematics anxiety in pre-service elementary teachers. *Action in Teacher Education*, 19(4), 29–38.
14. Heron, J. (1974) *The Concept of the Peer Learning Community*. Guildford, University of Surrey, Department of Educational Studies. The Human Potential Research Project.
15. Jackson, C. D., & Leffingwell, R. J. (1999). The Role of Instructors in Creating Math Anxiety in Students from Kindergarten through College. *The Mathematics Teacher*, 92(7), 583-586. <http://www.jstor.org/stable/10.2307/2797118>
16. Jarvis, P. (2006). *The theory and practice of teaching*. London: Routledge.
17. Kuckartz, U. (2014). *Qualitative text analysis: A guide to methods, practice and using software*. Sage
18. Lazarus, R.S. & Folkman, S. (1984). *Stress appraisal and coping*. New York: Springer
19. Lumley, M. A., & Provenzano, K. M. (2003). Stress management through written emotional disclosure improves academic performance among college students with physical symptoms. *Journal of Educational Psychology*, 95(3), 641–649. <https://doi.org/10.1037/0022-0663.95.3.641>
20. Perry, A. B. (2004). Decreasing mathematics anxiety in college students. *College Student Journal*, 38(2), 321–324.
21. Reason, P. (1998) 'Political, epistemological, ecological and spiritual dimensions of participation', *Studies in Culture, Organisation and Society*, Vol. 4, pp. 147–167
22. Shulman, L. S. (1986). Those Who Understand: Knowledge Growth in Teaching. *Educational Researcher*, 15(2), 4-14.
23. Shulman, L. (1987). *Knowledge and Teaching: Foundations of the New Reform*. Harvard Educational Review, 57(1), 1-23.

- <https://doi.org/10.17763/haer.57.1.j463w79r56455411>
24. Shulman, L. S. (1998). Theory, Practice, and the Education of Professionals. *The Elementary School Journal*, 98(5, Special Issue: John Dewey: The Chicago Years), 511-526.
 25. Smith, B. L. (2001) 'The challenge of learning communities as a growing national movement', Peer Review, Association of American Colleges and Universities, Summer/Fall, Vol. 3, No. 4 / Vol. 4, No. 1
 26. Vasilaki E. & Anastasakis M. (2023) An Exploratory Case Study of an Integrated Cognitive Model of Emotion Development [Manuscript submitted for publication]
 27. Vygotsky, L. S. (2019). L. S. Vygotsky's Pedological Works: Volume 1. Foundations of Pedology. Singapore: Springer Singapore. doi:10.1007/978-981-15-0528-7
 28. Wenger, E. (1999) *Communities of practice: Learning, Meaning, and Identity*, Cambridge: Cambridge University Press
 29. Yin, R. K. (2018). *Case Study Research and Applications: Design and Methods* (6th ed.). Thousand Oaks, CA: Sage.

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