

A Case Report on Using Biofeedback for Psychological Assessment

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Introduction:

It is well known that children's behavioral and emotional problems are closely related to parental conflict. Many prior studies have indicated a possibility that frequent and destructive conflicts between parents can induce children's maladaptive responses and eventually cause psychopathology. Kelly (2018)¹ elucidated that child behavioral dysregulation was a maladaptive response to marital conflict and correlated with increased parental disputes. Kitzmann (2003)² and others used a cognitive-contextual model and reported the effects of parental conflict upon children. They also uncovered the utility of evaluating children's perceptions toward parental conflict, rather than solely relying on reports from parents.

Furthermore, there have been some studies on the relationship between marital conflict during family mediation and children's maladaptive responses. Rudd et al. (2015)³ described that parents were not fully aware that children were exposed to parental conflict and did not sufficiently understand the difficulties children were confronted with.

Nevertheless, there is limited evidence on how a parental system affects a child's internal process. Therefore, it is challenging for parents to understand that the behavior and symptoms of their child reflect the happenings at home.

Wai-Yung Lee et al. (2010)⁴ investigated the interrelation between children's physiological responses and parental conflicts and developed a procedure to share such information with the family to induce therapeutic change. In family therapy using biofeedback, a protocol consisting of parental conflict discussion and debriefing was appraised as a powerful tool for resolving marital conflict. In addition, it was able to visualize the issues that children were experiencing regarding parental conflict.

While Lee et al.'s study included 6- to 15-year-olds, this case research adopted family therapy using biofeedback as a family assessment for a child who had grown up with the parents. This case report will demonstrate that performing family therapy with biofeedback for families having a grown-up child could improve treatment outcomes in long-term maladaptive responses of the child.

Case example:

The patient was a 20-year-old woman who was born and brought up in Japan with a westerner father and a Japanese mother. She started to be absent from school when she was 13 years old and was dropped out of high school. Subsequently, her mental condition continued to be unstable, and she was hospitalized at the age of 20. Her symptoms varied from time to time, and she had been diagnosed with adjustment disorder, eating disorder, schizophrenia, autism, etc. She showed fewer verbal and emotional expressions. Not only the patient, but the parents and the doctor also seemed unclear about the cause of those symptoms. While she was in the hospital, the mother visited her on a daily basis, and the father came to see her during weekends. Both parents were anxious about her condition but believed that nothing could be done. Her primary doctor provided treatment mainly with pharmacotherapy. However, there was no improvement in her symptoms, and the doctor was also facing limits of hospital care. Correspondingly, the doctor contacted the author requesting assessment of the patient. At the interview sessions before the assessment, the parents were cooperative for her treatment but had different opinions among them regarding certain details, which seemed to confuse the patient. For instance, when the author made an appointment for an interview with the parents through the patient, it was difficult to schedule the date and time because the parents could not communicate with each other smoothly.

Family Assessment Protocol

The family assessment included an assessment, debriefing, and joint family sessions.

Before the assessment and after the joint family session, Family Assessment Device (FAD) was performed for the client and the parents. This study employed a Japanese version of FAD (Epstein et al., 1983)⁵ developed by Saeki et al. (1997)⁶ with verified reliability and validity.

The debriefing session was held the next day of the assessment session. Subsequently, the joint family session was conducted once a week with a total three times.

Research Tools

To record the client's physiological responses, this study used Biograph Infiniti Software to manage the collected data with a computer. Furthermore, Procomp was employed to measure physiological indicators. Skin Conductance (SC) and Heart Rate (HR) were selected as physiological indicators. Two SC sensors were attached to the client's index and ring fingers, while an HR sensor was set to the middle finger. Previous studies have elucidated that SC could

be utilized as an indicator for the autonomic nervous system's arousal and was affected by certain emotional stimuli (Bierman, 2000).⁷

The Procedure of Assessment Session

The tasks were divided into three categories. First, the baselines of the physiological indicators were measured for 10 minutes, followed by approximately 70 minutes of parental discussion. The physiological indicators were measured in real-time during the parental discussion as well. Lastly, after measuring physiological indicators, a 30-minute debriefing session was carried out the next day. All the tasks were recorded on video so that the parental discussion and facial expression of the client could be checked simultaneously.

A clinical psychologist (author) conducted the session, while physiological indicators were obtained by an assistant mechanical operator (occupational therapist).

Data Analysis

For analyzing the data, the patient arousal time was compared with a corresponding video scene of the parental discussion. The scenes associated with the arousal time were extracted so as to investigate the characteristics of the parental conflict and patterns of their discussion. With the collected data, the debriefing session was subsequently performed. Before the parental discussion, the means and standard deviations of 10-min SC and HR at rest were recorded. Subsequently, the means of SC and HR were measured every two minutes during the parental discussion session, and the points where both sensors exhibited a difference of two standard deviations or more than the respective means at rest were identified. The difference could be either positive, negative, or both.

Results

Assessment Session

As shown in Table 1, SC was higher than 2SD of the mean at rest immediately after the parental discussion began, and exceptionally high values of SC were confirmed after 40 to 60 minutes. The study then examined video scenes corresponding to the time when SC was exceptionally high and found a gap in the conversation. The father and mother obviously had a miscommunication.

HR was either lower or higher than 2SD of the mean value at rest at 50, 60, and 66 minutes after the commencement of the parental discussion. These corresponding video scenes illustrated that when HR changed significantly, the father suddenly raised his voice, or the parents were not on the same wavelength.

Debriefing Session

In the debriefing session, the patient, parents, and the psychologist watched together video segments of the assessment session along with the data of physiological indicators.

The session commenced with video scenes corresponding to the time when the client's physiological responses indicated a difference of 2SD or more than the means at rest. During the process, the client was encouraged and asked to provide feedback and share her views on each scene. Similarly, the parents were requested to talk with each other and to respond to their child.

The first significant finding in this session was that both the parents had language problems (father's limited understanding of Japanese and mother's understanding of English hindered sufficient communication between them), and the client played the role of an interpreter between them. The psychologist recognized that, being caught in the middle of parental conflict, the client was being made a scapegoat by the parents.

Secondly, the client, who had hardly shown verbal and facial expressions, made many remarks regarding herself and the family in the session. For example, "I haven't decided anything about my future, so don't decide it only by your own opinion," "You two are not listening to each other."

Joint Family Session

In the joint family session after the debriefing, there was a discussion that the family did not have their personal space. Even if she wanted to have some time to think about herself, the client had no choice but to support daily miscommunication between the parents because they were all in the same space.

Furthermore, the most critical issue for the client was her nationality. She must decide her nationality by the age of 20. Without listening to her true feelings, the father was trying to make her choose his home country, while the mother took it for granted that she would definitely select Japanese nationality. In fact, they had never discussed it before. In Japan, children of international couples must choose one of the nationalities before reaching 20 years of age. In the

joint family session, the client clearly told the parents for the first time that she could not decide her nationality yet, and needed more time to consider.

The parents agreed with her and applied for a grace period.

Table 2 presents changes in FAD before the assessment session and after the joint family session. FAD consists of seven subcategories with a total of 60 items. In each item, 2.2 or higher is deemed as dysfunction. Among the seven subcategories, the father and the client had decreased Affective Responsiveness (AR) values after the joint family session. Specifically, the AR of the client declined from 2.17 to 1.33; that is, it was less than 2.2 after the session. Regarding the mother, almost all the items were elevated after the joint family session, although Affective Involvement marginally decreased.

Follow-up and Outcome

One month after the assessment session, symptoms such as hyperesthesia disappeared, and the client was discharged at her own will. Although it may take some time to solve the marital problems, the structure's foundation that does not make the client a scapegoat seemed to be established.

Discussion

Alexithymia is a personality trait characterized by a difficulty in recognizing and verbalizing emotions and an externally oriented cognitive style rather than emotional experience (Taylor et al., 1997)⁸. It is known to be associated with various psychological disorders, including depression, anxiety, and eating disorders, and is considered as a factor of vulnerability that affects the symptoms and the process of various mental illnesses (Taler and Bagby, 2012)⁹. The client of this study was deemed to have the personality trait of alexithymia. The findings of this research demonstrated that she actually responded physiologically despite trying to conceal her true feelings. In addition, FAD depicted the elevation of emotional responses after the assessment. Her lack of expression had made it difficult to receive treatment benefits; however, the visualized physiological responses could bring out her expression.

Moreover, by presenting not only the changes of the client but also such scientific evidence in a convincing way, this research could verify the method as a powerful tool to move the parents and client to challenge the conflict, a core issue of the family relationship. This method

as a protocol could play a crucial role in connecting the parental conflict and behavior (symptoms) of the client, as well as giving her persuasive realization.

The assessment session was successfully activated with the involvement of the parents, who had avoided facing the conflict. In contrast, the client who had hardly shown expression was very willing to participate in the debriefing session, which was extremely stimulating. Considering this attitude, the parents strongly recognized the necessity to face their dilemma and conflict. Furthermore, in the joint family session strategically, the client was first asked to respond to the protocol so that the parents could move with the trigger. Doing so could prepare a context in which their attention was shifted from the client's symptoms to the family issue.

The method used in this research enabled to shorten the time required for the client and the family to recognize and work on the core of the parental conflict, which a therapist could usually achieve in an extended period. In this respect, biofeedback was utilized in this study as a tool to shift the focus of the family from the client to their relationship, rather than as a measuring method. Accordingly, the use of biofeedback techniques could provide robust and persuasive evidence for the psychological assessment process.

Associated with various fields, including measurement of physiological data, method of developing a protocol, and importance as a case study, this assessment process was rather complicated. As for future prospects, however, it would be worthwhile to research those individual aspects in detail.

Ethical Considerations

This study was approved by the Medical Ethics Committee of Kanazawa University (approval number: 1638). Besides, at the commencement of this research, oral and written consents were received from the client and her parents. Furthermore, this study was conducted according to the principles of the Declaration of Helsinki.

References

1.Kelly A. Warmuth, E.Mark Cummings, Patrick T.Davies. 2018.Behavioral Dysregulation as a Mediator between Destructive Marital Conflict and Children's Symptoms of Psychopathology. Journal of Child and Family Studies 27(4):2004-2013.

2. Kitzmann KM, Cohen R. 2003. Parents' versus children's perceptions of interparental conflict as predictors of children's friendship quality. *Journal of Social and Personal Relationships*. 20:689–700.
3. Brittany N. Rudd, Amy Hotzworth–Munroe, Amy G. Applegate, Brian M. D'Onofrio, Robin H. Ballard, John E. Bates. 2015. Associations between Parent and Child Reports Of Interparental Conflict/Violence And Child Difficulties in A Family Mediation Setting. *FAMILY COURT REVIEW* 53(4):602-616.
4. Wai-Yung Lee, Man-Lun NG, Benk.L.Cheung, Joyce Wa Yung, M. 2010. Capturing Children's Response to Parental Conflict and Making Use of It. *FAMILY PROCESS* 49:43-58.
5. Nathan B. Epstein, Lawrence M. Baldwin, Duane S. Bishop. 1983. THE McMASTER FAMILY ASSESSMENT DEVICE. *Journal of Marital and Family Therapy* 9(2):171-180.
6. Toshinari Saeki, Nozomu Asukai, Yuko Miyakae, Masahiro Miguchi, Shigeto Yamawaki. 1997. Reliability and validity of the Japanese version of the Family Assessment Device (FAD). *Japanese Journal of Psychiatric Treatment*. 8(2):181-1-92.
7. Bierman, D. J. 2000. Anomalous baseline effects in mainstream emotion research using psychophysiological variables. Paper presented at the 43rd Annual Convention of the Parapsychological Association, 17-20 August, Freiburg Breslau, Germany: 34–47.
8. Taylor, G. J., Bagby, R. M., & Parker, J. D. A. Disorders of affect regulation: Alexithymia in medical and psychiatric illness. Cambridge University Press; 1997:7-45
9. Taylor, G. J., & Bagby, R. M. The alexithymia personality dimension. In T. A. Widiger (Ed.), *Oxford library of psychology. The Oxford handbook of personality disorders*. Oxford University Press. 2012:648-673