

The Usage of Mediation in Interpersonal Bias Mitigation

Salini Pillai¹ and Natalie Elkin^{1#}

¹Granite Bay High School

#Advisor

ABSTRACT

Oftentimes, biases, whether conscious or unconscious, may be easily identifiable from language choices; however, the most effective approach to address such mindsets is more ambiguous. Small tonal inflections, negative body language, and accusatory language choices are commonplace approaches to addressing bias which can result in defensive behavior, ultimately preventing people from processing new information, a function that is imperative in reduction of bias. Such approaches may also anger those who express biased viewpoints, thus, causing an increase in heart rate (Kreibig, 2010). This increase shifts decision making from the frontal lobe, involved with morality and rational thought, to the limbic system which is involved with emotional thinking and impulsivity. Additionally, past studies have linked such physiological changes to a reduced capacity to adequately reason and evaluate societal problems (Grossman et. al., 2016). Although mediation is a strategy used in the legal field to facilitate conversations, this procedure may be applied to other fields, whereby the strategic process may prevent escalation and reduce biases. The techniques that mediators use in facilitating conversations could be key to addressing bias in interpersonal interactions. Alternatively, though the accusatory approach is most commonly used in addressing bias, the efficacy of such an approach is questionable. This study aimed to test the effects of these two approaches by presenting subjects with both in a controlled setting and attempting to see whether or not mediation should have a role in addressing biases and reducing prejudice. Results indicated that mediation was more successful in minimizing increases in heart rate.

Research Questions

1. Does mediation used in the legal field work in reducing biases?
2. Which approach causes more variation in heart rates of the subjects?
3. Which approach is ultimately more effective in inhibiting physiological arousal?

Literature Review

Implicit bias is a concept that is currently at the forefront of collective human thought, evidenced by both the plethora of broadcast news and contemporary research articles. Evidence of its many malignant effects can be found in almost every facet of society. Implicit bias is defined as “an association in long-term memory between social objects and valence.” Police brutality towards colored populations is a clear example of such biases. Implicit biases are generally unintentional and fast-acting (Rudman, 2004). Statistical evidence has loosely linked implicit bias measurements to manifestations of explicit bias (Dovidio et al., 2001). And despite the existence of a large body of antidiscrimination law, workplace decisions continue to be driven by implicit biases (Jolls and Sunstein, 2006).

Currently, much of the work around bias has been based around the identification of it in everyday interactions without addressing possible mitigation. Prominent measurement methods in this field include the Implicit Association Test (IAT) and Priming, which both belong to a category of implicit measures known as response latency

measures (Rudman, 2004). It is commonly acknowledged that the first step to mitigating implicit biases is acknowledging their presence (Dalton and Villagran, 2018). Much of the available work in mitigation of bias has been done in the modern workplace—particularly in the emerging field of diversity and inclusion (Bielby, 2000; Greenberg, 2015). Current strategies to address bias in an institutional context include bringing accountability into the system by developing clear metrics in employment selection processes, thus creating a system that allows individuals to thrive despite the existence of implicit biases (Bielby, 2000). However, addressing explicit manifestations of bias in interpersonal interactions is more of an ambiguous question. In order to facilitate the bias reduction process in the workplace, a reconciliation-focused dispute resolution system has been proposed to resolve conflict. With this method, the authors aim to “promote awareness [and] understanding” (Greenberg, 2015). In contrast, the most common approach is blame, which characterizes individuals as the victim or the offender (Greenberg, 2015). Although such an approach has proven to be effective in reducing future biased behavior, it is unclear whether the change in behavior is due to a newly changed perspective or a fear of social repercussions (Czopp et al., 2006). In addition, such confrontation also elicited negative emotions towards the confronter (Czopp et al., 2006). These negative emotions can lead to increased heart rate (HR) and decreased heart rate variability (HRV) (Kreibig, 2010).

Studies have shown a relationship between decrease in HRV and reduction of decision-making along with information-processing capacities. The inverse correlation between HR and HRV suggests that such decreases in HRV are accompanied by increases in overall HR (Kazmi et al., 2016). High HRV is also associated with stronger regulation of emotional responses via the medial prefrontal cortex and the amygdala network, meaning that emotions are regulated in a more controlled manner (Sakaki et al., 2016). Since bias is found in the amygdala (Dalton and Villagran, 2018), inhibitory functions of the network could potentially aid in bias mitigation. Data finds coding in the frontal cortex indicating that bodily arousal, which can be measured by heart rate, impacts decision-making, an important in bias mitigation (Fujimoto et al., 2021). Additional evidence has suggested that the amygdala affects the prefrontal cortex, which impacts our cognition (Wei et al., 2018). In studies of judgment, it was found that individuals with higher HRV tended to make better judgments of social issues and behavior, regardless of whether they were viewing the issue from a self-distanced perspective or a self-immersed viewpoint (Grossmann et al., 2016). Those with superior decision-making capabilities, as measured by the Iowa Gambling Task (IGT), also displayed higher HRV (Forte et al., 2021). Ultimately, this shows that when they are not in a state of physiological arousal, human beings are better able to actively and effortfully process information.

In the legal field, mediation is a practice used to resolve disputes and facilitate productive conversations. Studies have found that mediation is effective in settling around 78% of disputes (Brett et al., 1996). As a process, mediation looks at the humanity of litigants, allowing them the chance to express their viewpoints and perspectives, rather than aligning with the strict view in traditional litigation that tends to mislabel people and aspects of the situation (Phillips, 2001). Ultimately, one of the major skills required for a mediator is active listening, wherein participants of mediation are given the freedom to express their inner emotion and feel listened to (Whatling, 2012). Other common conflict management skills used in mediation include respectful communication and empathy (Shapiro, 2004). Strategies like these help build trust in the mediator, which is a vital factor in mediations (Coleman et al., 2014). Mediators also employ neutral, open-ended questions so as to achieve a solution in a way that respects all parties involved (Stark, n.d.). Effective mediators focus on being informative and choose to provide factually accurate claims rather than fixating on the inaccurate claims made by the opposing party (Eddy, 2007). In a mediation approach, success is achieved at the conception of a final decision that is acceptable to all parties involved (Căprariu and Nistorescu, 2007). I hypothesize that mediation can be used to lower heart rate in interpersonal interactions, so that an environment can be cultivated in which a biased person can actively process and integrate new information.

In order to address implicit bias, this study integrates mediation techniques to minimize physiological arousal which allows the active integration of new information into our cognition.

Method

General Procedure

A procedure requiring subjects to play a role will be used to conduct the experiment. It consists of presenting participants with a confederate who will employ either the mediation approach or the commonly used accusatory approach. Since correlations between HRV and HR with decision-making capability has been already established, this study will measure HR using the Oxysmartm Finger Oximeter to determine whether certain approaches to bias mitigation can be more effective in cultivating an environment conducive to information processing.

Subjects

The subjects will be twenty AP psychology students from a high school in California who will be selected through in-class advertisement. As compensation, they will be exempt from doing one AP psychology assignment. They will receive this compensation even if they choose to withdraw. Ten participants will be randomly assigned to the control group receiving the accusatory treatment and the remaining ten will receive the mediation treatment. Anonymity of the participants will be preserved by assigning them a number and attributing any data collected to this number rather than personal information.

Personnel

The roles of mediator and accuser will be played by two different students. These confederates will be dressed in neutral shades and will wear a face covering to prevent any reaction to physical appearance since perception of attractiveness can affect heart rate. Another confederate will be used to give the subject the materials for the experiment.

Cover Story

Subjects will be informed that they will be participating in an experiment testing high school students' ability to spontaneously play roles. All subjects will be told that they will be playing the role of a biased person who feels strongly about their views and will be instructed to express a bias that those who attend their school are superior to those who attend other schools on a form during the experiment. Additionally, the subject will be informed that any other students in the room will also be playing a role and that any interaction they have with this "subject" is also part of the experiment. They will be warned that they may face feelings of distress in the process of playing this role and be told that one of the factors measuring the authenticity of their acting is HR. Parents of the student will have complete information about the study and its goals before signing consent forms and thus will be asked not to divulge any information to the participants. A parent meeting will be held to offer further clarification. Participants will be informed that they are free to withdraw from the experiment at any time and that any interactions they may have during the experiment will bear no further consequences for them. In addition, they will also be adequately debriefed after the experiment and necessary data analysis.

Procedure

Subjects will enter the room one at a time under the guise of the cover story. Upon entry, they will be presented with a clipboard and a heart rate monitor, which they are required to wear and instructed to sit next to another confederate. They will also be required to fill out a demographic survey (Appendix A). Their heart rate during this time will be measured to establish a baseline. The clipboard will contain a piece of paper (Appendix B) with the following prompt:

As humans, we tend to have different beliefs about others but this doesn't necessarily mean that these notions are wrong. In the space below, please list one such belief that you believe to be true.

Once the participant has filled out the form with the bias outlined above, the subject will be required to wait for five minutes before leaving. During this time period, the second confederate (sitting next to the subject), whom the subject assumes is also playing a role, will begin speaking under the guise of making conversation. This confederate will request to see the subject's paper. Once this has occurred, the actions of the confederate change depending upon whether the subject has been assigned to the control group or to the experimental group.

Option 1: Control Group

Upon viewing the subject's paper, the confederate will raise their eyebrow in a shocked expression and then ask the subject in loud and forceful tones, "Wow, how could you genuinely believe something like that?" and then proceed to say "You know what, that is messed up and you're wrong. I will be telling the administration that you said this. I mean in this day and age, how can you be so biased?"

During this process, the heart rate of the subject will be measured using the heart rate monitor that they had worn upon entry.

Option 2: Mediation Driven Approach

Upon viewing the subject's paper, the confederate will remain calm and ask the open-ended question: "Where do you think this belief comes from?" In order to establish the trust that is emphasized in mediation, the confederate will react in a kind and understanding manner and keep a smile on their face. Next, the confederate will ask the question: "What evidence might it take to change your belief?" After the subject responds, the confederate will pose a final question: "Do you think that the evidence you need to change your belief exists?"

Throughout this exchange, the heart rate of the subject will be measured using the heart rate monitor that they had worn upon entry.

After this exchange with the second confederate, the first confederate will reenter the room and collect the heart rate monitor and clipboard from the subject. After filling out a post survey to provide qualitative data (Appendix C), the subject will be permitted to leave the room, thus concluding the experiment.

Limitations/Potential Confounding Variables

Subjects are not reporting their own biases, thus reactions to the approaches may not be as authentic. This research is dependent upon the data that links physiological arousal to rational thought, which can also be impacted by other factors including but not limited to changes in perspectives and mental/physical state such as stress due to school or family issues. Additionally, environmental stimuli can cause physiological arousal as well, and thus fluctuations in heart rate cannot be completely attributed to the approaches.

Risks

The confrontational approach may put the student under duress due to the fact that they are accused of being biased. However, since the student is aware of the fact that they are playing a role and not defending their true beliefs, this harm is minimized by the procedure. Role-playing allows the participant to emotionally disconnect from the situation while still maintaining relative authenticity of response. If they don't feel comfortable during the interaction, they can opt out at any point and thus will be informed that they can choose not to participate in the experiment at any given time.

Analysis

The mean values for increases in HR observed in the control and experimental groups will be calculated and then compared to determine whether or not one approach yields greater increases in HR. A 2 sample T test procedure will be used to determine whether the difference in heart rate increase between the two approaches is statistically significant. A significance level of 5% will be used as the alpha value and the test statistic will be computed for the difference in heart rates during the 2 interactions to find out whether the increases in heart rate are statistically different.

Hypothesis

I hypothesize that mediation strategies to address bias are less likely to initiate physiological arousal, demonstrated through elevated heart rates, than the common accusatory approach used throughout society.

Results and Data Analysis

Figure 1: Raw Data

Partici- pant	Heart Rate Before (pr/min)	Heart Rate After (pr/min)	Difference (After-Before)	Treatment
1	86	91	5	Mediation
2	77	82	5	Mediation
3	75	75	0	Mediation
4	69	82	13	Mediation
5	85	96	11	Mediation
6	62	68	6	Mediation
7	75	85	10	Mediation
8	93	98	5	Mediation
9	65	67	2	Mediation
10	96	97	1	Mediation
11	84	119	35	Accusatory

12	85	104	19	Accusatory
13	82	117	35	Accusatory
14	72	130	58	Accusatory
15	85	127	42	Accusatory
16	83	99	16	Accusatory
17	98	136	38	Accusatory
18	86	106	20	Accusatory
19	73	96	23	Accusatory
20	81	125	44	Accusatory

Figure 2: Sample Statistics

Sample name	Number of samples	Mean	Standard error of the mean	Standard deviation	Median
Mediation	10	5.800	1.373	4.341	5.000
Accusatory	10	33.000	4.235	13.392	35.000

Test for Significance:
 Independent t-test

μ_1 = True mean increase in heart rate for students given mediation approach
 μ_2 = True mean increase in heart rate for students given accusatory approach

$H_0: \mu_1 = \mu_2$
 $H_A: \mu_1 < \mu_2$

Conditions for inference:

1. Random Assignment
2. $10 < n$ (Student Population)
3. Approximately normal -
 - a. Normal Probability Plot is approximately linear for both samples (see below)
 - b. Normal by Shapiro-Wilk test

Figure 3: NPP Mediation Treatment

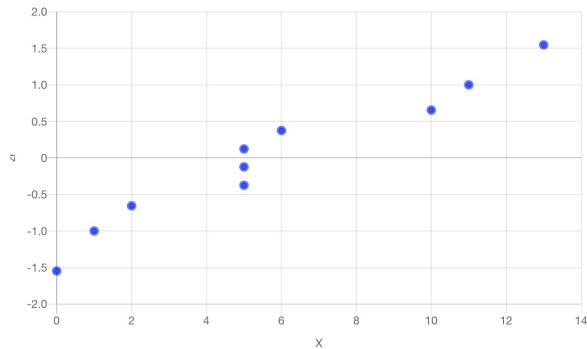
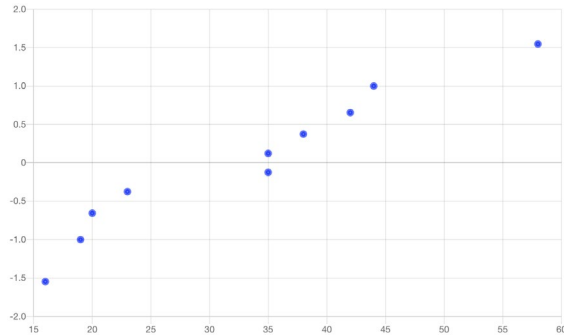


Figure 4: NPP Accusatory Treatment



$t = -6.110003048$

$p = 4.0107537E-5$

$df = 10.87079267$

Results:

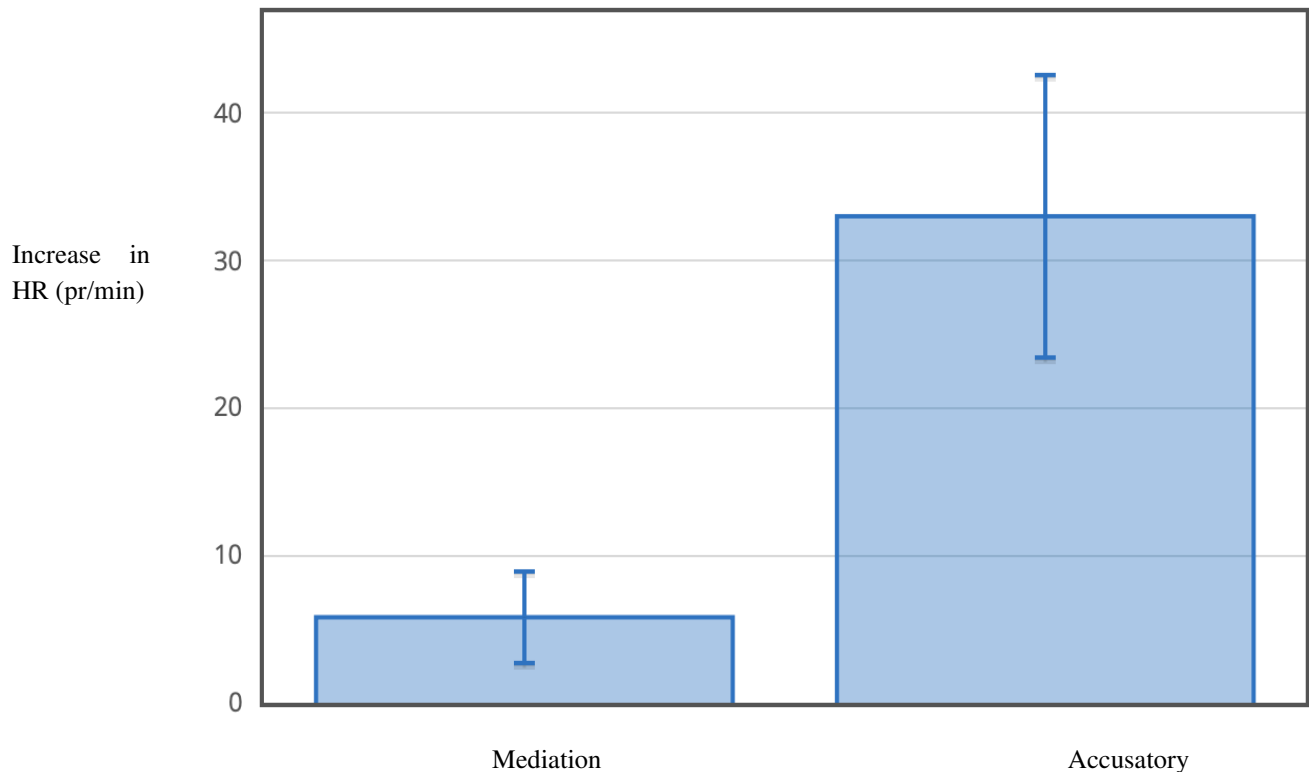
$P\text{-value} < \alpha$

$4.0107537E-5 < .05$

Reject H_0

There is significant evidence to conclude that the true mean increase in heart rate for students given the accusatory approach is greater than the increase for students given the mediation approach.

Mean Increase in Student HR for Accusatory vs. Mediation



Discussion

Data suggests that there is a statistically significant difference between the mean increase in HR caused by the mediation and accusatory approaches. Thus, there is significant evidence to conclude that the true mean increase in heart rate for students given the accusatory approach is greater than the increase for students given the mediation approach. In addition, though both groups reported feelings of confusion and nervousness about the situation, students given the accusatory treatment were more likely to report feeling negatively, with descriptions including “flustered”, “stressed”, “tense” and “attacked”. On the other hand, students in the mediation approach chose to describe the situation in more neutral terms, using descriptors like “neutral”, “calm”, and “comfortable”. The difference in descriptors utilized could indicate levels of arousal experienced by the subject. The increased level of arousal caused by the accusatory treatment shows an impairment in decision-making ability (Fujimoto et al., 2021). Conversely, the mediation approach was marked by a lower usage of negative descriptors among subjects and yields a comparatively modest increase in HR, thus indicating lower levels of arousal. This could indicate that the mediation approach is more effective at minimizing arousal in interpersonal bias mitigation.

Conclusion

At this juncture in time, it is imperative that we work to address the psychological barriers that currently translate to inequality. Currently, there is a lack of research showing the efficacy of different techniques to approach bias. By measuring heart rate, this study measures receptiveness towards new information which is often a key factor in changing opinions. If mediation works to promote information processing capabilities in interpersonal interactions aiming to reduce bias, this technique can be cross applied from the legal field. This research would empower individuals to

think in a less prejudiced manner, thus fostering a learning environment. By creating situations where people can actively process information, we can disseminate ideas of equality and begin to combat generations of established prejudice. In doing so, this work represents a vital first step in changing mindsets.

References

- Bielby, W. T. (2000). Minimizing workplace gender and racial bias. *Contemporary Sociology*, 29(1), 120. <https://doi.org/10.2307/2654937>
- Brett, J. M., Barsness, Z. I., & Goldberg, S. B. (1996). *Effectiveness of mediation: An independent analysis of cases handled by four major service providers*. Effectiveness of Mediation: An Independent Analysis of Cases Handled by Four Major Service Providers | Office of Justice Programs. Retrieved November 2, 2021, from <https://www.ojp.gov/ncjrs/virtual-library/abstracts/effectiveness-mediation-independent-analysis-cases-handled-four>.
- Coleman, P. T., Deutsch, M., Marcus, E. C., Lewicki, R. J., & Wiethoff, C. (2014). Chapter 4: Trust, Trust Development, and Trust Repair. In *The Handbook of Conflict Resolution* (pp. 86–107). essay, Jossey-Bass.
- Czopp, A. M., Monteith, M. J., & Mark, A. Y. (2006). Standing up for a change: Reducing bias through interpersonal confrontation. *Journal of Personality and Social Psychology*, 90(5), 784–803. <https://doi.org/10.1037/0022-3514.90.5.784>
- Căprariu, O., & Nistorescu, T. (2007). Patterns and Strategies of Interpersonal Conflicts Mediation During the Projects. *Management & Marketing*, V(1).
- Dalton, S., & Villagran, M. (2018). Minimizing and addressing implicit bias in the workplace: Be proactive, part One. *College & Research Libraries News*, 79(9), 478. <https://doi.org/10.5860/crln.79.9.478>
- Dovidio, J. F., Kawakami, K., & Gaertner, S. L. (2002). Implicit and explicit prejudice and interracial interaction. *Journal of Personality and Social Psychology*, 82(1), 62–68. <https://doi.org/10.1037/0022-3514.82.1.62>
- Forte, G., Morelli, M., & Casagrande, M. (2021). Heart rate variability and decision-making: Autonomic responses in making decisions. *Brain Sciences*, 11(2). <https://doi.org/10.3390/brainsci11020243>
- Fujimoto, A., Murray, E. A., & Rudebeck, P. H. (2021). Interaction between decision-making and interoceptive representations of bodily arousal in frontal cortex. *Proceedings of the National Academy of Sciences*, 118(35). <https://doi.org/10.1073/pnas.2014781118>
- Greenberg, E. E. (2015). Fitting the forum to the pernicious fuss: A dispute resolution design to address implicit bias and 'isms in the workplace. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.2636840>

- Grossmann, I., Sahdra, B. K., & Ciarrochi, J. (2016). A heart and a mind: Self-distancing facilitates the association between heart rate variability, and wise reasoning. *Frontiers in Behavioral Neuroscience, 10*. <https://doi.org/10.3389/fnbeh.2016.00068>
- Hunter, M. (2020, June 22). *How To Write A BIFF Response*. High Conflict Institute. Retrieved November 3, 2021, from <https://www.highconflictinstitute.com/hci-articles/how-to-write-a-biff-response>.
- Jolls, C., & Sunstein, C. R. (2006). The law of implicit bias. *California Law Review, 94*(4), 969. <https://doi.org/10.2307/20439057>
- Kazmi, S. Z., Zhang, H., Aziz, W., Monfredi, O., Abbas, S. A., Shah, S. A., Kazmi, S. S., & Butt, W. H. (2016). Inverse correlation between heart rate variability and heart rate demonstrated by linear and nonlinear analysis. *PLOS ONE, 11*(6). <https://doi.org/10.1371/journal.pone.0157557>
- Kreibig, S. D. (2010). Autonomic nervous system activity in emotion: A Review. *Biological Psychology, 84*(3), 394–421. <https://doi.org/10.1016/j.biopsycho.2010.03.010>
- Phillips, B. A. (2001). Introduction: Mediation and Wholeness. In *The Mediation Field Guide: Transcending Litigation and resolving conflicts in your business or organization* (pp. XIII-XXVI). essay, Jossey-Bass.
- Rudman, L. A. (2004). Social Justice in our minds, homes, and society: The nature, causes, and consequences of implicit bias. *Social Justice Research, 17*(2), 129–142. <https://doi.org/10.1023/b:sore.0000027406.32604.f6>
- Sakaki, M., Yoo, H. J., Nga, L., Lee, T.-H., Thayer, J. F., & Mather, M. (2016). Heart rate variability is associated with amygdala functional connectivity with MPFC across younger and older adults. *NeuroImage, 139*, 44–52. <https://doi.org/10.1016/j.neuroimage.2016.05.076>
- Shapiro, D. (2004). Student Mediation: Introduction. In *Conflict and communication, a guide through the Labyrinth of Conflict Management* (pp. 201–201). essay, International Debate Education Association.
- Stark, S. J. (n.d.). Formulating Neutral Open-Ended Questions in Mediation: An Approach. *Institution of Continuing Legal Education*.
- Wei, L., Chen, H., & Wu, G.-R. (2018). Structural covariance of the prefrontal-amygdala pathways associated with heart rate variability. *Frontiers in Human Neuroscience, 12*. <https://doi.org/10.3389/fnhum.2018.00002>
- Whatling, T. (2012). *Mediation skills and strategies: A practical guide*. Jessica Kingsley Publishers.