

Exploring Intimate Partner Violence (IPV) Through an Evolutionary Perspective: Anger as a Triggering Factor

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Abstract: With infidelity existing both in ancient environments and in modern society, our study introduces two adaptive problems from an evolutionary perspective: sexual jealousy and paternal uncertainty. The adaptations evolved from these adaptive problems are the behavioral outcomes of mate guarding. Our research aims to investigate how Intimate Partner Violence (IPV) becomes a form of mate guarding. We hypothesized that anger is a crucial trigger between Welfare Tradeoff Ratios (WTR) and IPV. In cross-sectional analysis, we predicted that there are positive correlations between each of the three elements. Longitudinally, we expected changes in WTR differences to predict the frequency of IPV. Our research methodology consisted of recruiting male participants to complete online questionnaires assessing their expected and perceived WTR toward their partner, anger level, and IPV behaviors in response to fictional infidelity scenarios. Findings were designed to validate that anger largely mediates the relationship between WTR differences and IPV, highlighting the critical role of anger in mate guarding behaviors. By exploring how manipulating WTR differences can predict IPV frequency, our findings can inform treatment approaches, policy development, and educational programs that aim to reduce IPV by addressing WTR differences and anger management.

Keywords: Intimate Partner Violence, Welfare Tradeoff Ratio, Mate Guarding, Anger, Evolutionary Psychology

1. Introduction

A lot of problems faced in modern society already existed in our ancestral environment. These problems are not only limited to the environment and resources, but also include the complexity of social relationships. Since ancient times, the importance of reproductive resources has always been one of the critical concerns of an individual. Because of the scarcity and importance of reproductive resources, infidelity has become a challenge to be faced.

This research paper will mainly focus on the problem of female infidelity, that is, the situation when men face infidelity. In the situation when a male encounters infidelity, the adaptive problem faced by males is paternal uncertainty, and male sexual jealousy is a part of adaptation that solves this adaptive problem [1]. Male sexual jealousy manifests an emotion that arises in a sexual relationship when men suspect their partner of infidelity. Paternal uncertainty is when men cannot be

sure that they are the biological father of their child because males cannot have internal fertilization like females [2]. Female infidelity is costly for a male because they may invest in their rival's offspring, wasting time and resources, but bring benefits to their competitors' child [3]. Through evolution, the adaptation evolved from these adaptive problems is the outcome of mate guarding.

Mate guarding is a behavioral strategy designed to prevent partners from having sex with other potential rivals to protect one's own reproductive benefits. Shackelford [4] and his colleagues found that it is highly possible that mate guarding is related to IPV. There are two main forms of strategies to achieve mate guarding: benefit bestowing and cost inflicting [5]. Benefit bestowing is providing benefits and rewards to partners through positive behaviors to enhance relationship stability, resulting in less probability of partner's infidelity behavior. For example, when a man finds that his partner is in frequent contact with another man, he may be eager to buy his partner expensive gifts to reinforce his importance as a reproductive resource and make his partner realize that he can provide better resources for her and her children. Cost inflicting mate guarding involves imposing costs on partners and potential rivals through negative behavior that reduces the opportunity and motivation for a partner to have infidelity. For example, when a man finds out that his partner is constantly contacting a man, he may threaten her to stop the behavior and limit her social interaction and her social media access. In this form of mate guarding, there is a high risk of developing violent behaviors such as IPV.

Our research direction is to investigate the reason why mate guarding will eventually develop to the behavioral outcome of IPV. We believe that there is a causal model (see Fig.1) that acts between mate guarding and IPV with three factors: WTR, anger, and IPV behavior. The Welfare Tradeoff Ratio (WTR) [6], a cognitive mechanism that determines the importance an individual places on another's welfare, helps to explain how anger can trigger the emergence of IPV. In the theory of WTR, individuals have an inequality of welfare tradeoff ratios correlated to their benefits and costs. This inequality of WTR is used to maximize individuals' welfare and leads to behaviors such as cooperation. In the application of WTR, Sell [7] suggests that when an individual's WTR to the other is lower than what the other has expected, the other will show anger, which will function as a recalibration tool, to increase the individual's WTR. This tactic represents the recalibration theory of anger.

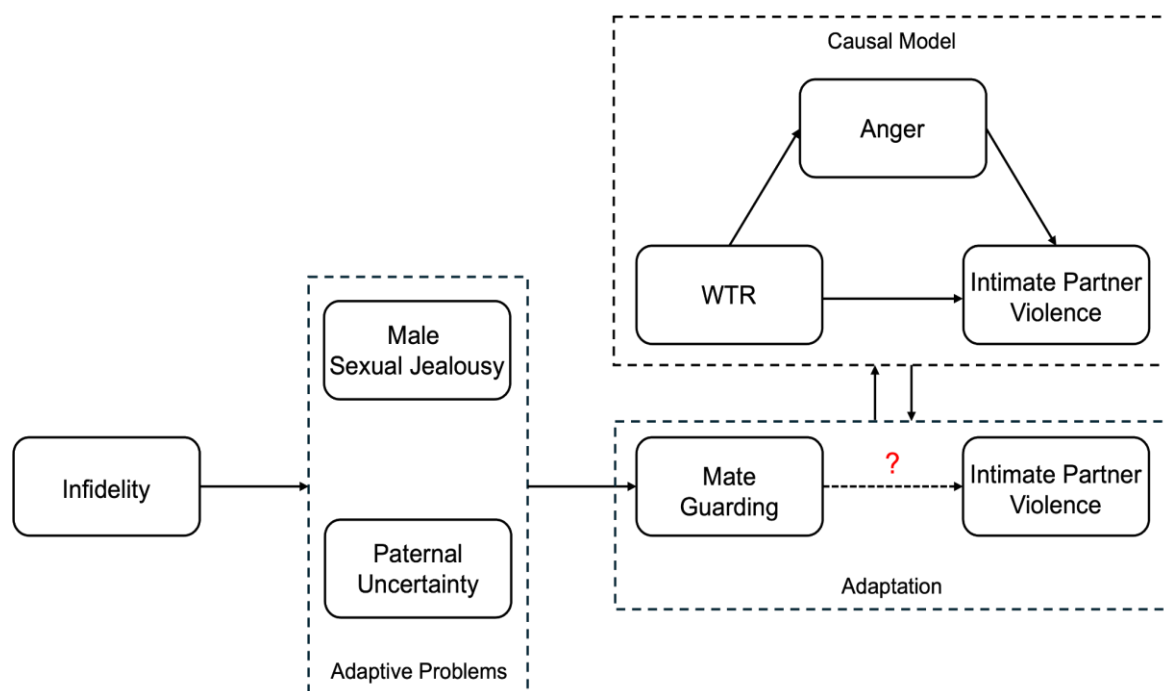


Figure 1: Adaptive problems, adaptation and causal model

Since anger acts as a crucial emotional trigger in violent behavior, we believe that anger is a significant triggering factor in forming IPV behavior. Research has found that individuals with higher negative emotionality, such as anger, are more likely to perpetrate IPV [8]. Given that anger is strongly associated with other violent behaviors, its presence in mate guarding can easily lead to IPV, which is a violent behavior.

Our study's aim is to propose that among these three elements: WTR difference, anger level, and IPV possibilities, each two of them have correlations. WTR difference is the difference between one's expected WTR and perceived WTR toward others. Anger level is measured through the Likert scale. IPV possibilities is the possibility of a person implementing IPV. In this way, we can try to prove that anger is a significant factor acting between WTR and IPV. This research paper aims to validate the following five hypotheses: Firstly, it is hypothesized that there is a positive correlation between WTR difference and anger level, i.e., higher difference in WTR can lead to higher anger level (H1); Secondly, there is a positive correlation between anger level and IPV possibilities, i.e., higher anger level can lead to higher IPV possibilities (H2); Thirdly, there is a positive correlation between WTR difference and IPV possibilities, i.e., higher difference in WTR can lead to higher possibilities of IPV (H3); Additionally, considering anger is the determinant emotional trigger of violent behavior, it is hypothesized that anger acts as a mediator between WTR difference and IPV possibilities (H4). In other words, the effect of anger acting as a mediator between WTR and IPV is remarkably stronger. Lastly, it is hypothesized that the increase or decrease in WTR difference can predict IPV frequencies (H5). If anger is indeed a critical emotional mediator between WTR and IPV, then by manipulating the WTR difference, the subsequent anger level can also be predicted, as a result, the frequency of IPV can be controlled.

2. Methods

2.1. Participants and procedure

All participants will be recruited from a professional research data platform. Each participant will be paid for completing the questionnaire. For the whole study, we only collect data from male participants. All participants will individually complete the questionnaire online.

First, we will use Welfare Tradeoff Ratios Scale (WTRS) to examine participants two different types of welfare tradeoff ratios called expected WTR (participants' expectation of WTRs from their partners to themselves) and perceived WTR (participants' perception of WTRs from their partners to themselves). Subsequently, we will provide two different fictitious scenarios involving infidelity behaviors of the partner, which will be arranged randomly. In one scenario, participants will face the infidelity behaviors of their own partner, and in another scenario, participants will face the infidelity behaviors of a third person's partner. Each scenario will include questions for participants to rate, and the questions are as follows. (i) feelings/emotions, (ii) aggressive intent, (iii) attitude toward committing violence, (iv) behavior of violence. All participants will be tested twice, and gap of period A and period B will be 6 months.

2.2. Measures and study design

2.2.1. Welfare tradeoff ratios

Adapted from Delton [9], we will have 60 decisions regarding partner-cost and self-benefit of the money. These decisions will be divided into six sets of ten decisions each. Each set will have a certain gain of money for self with cost of money of partner changing but will be calculated to the same set of possible welfare tradeoff ratios. See Tbl.1 for more details about welfare tradeoff decisions. We will use the same WTR decisions to test expected WTR from partner to self and perceived WTR from

partner to self with different questioning approaches. For expected WTR, we will ask the participants, “If your partner could gain 37 dollars, do you think your partner would be willing to let you to lose 54 dollars to get the money?”. For perceived WTR, we will ask the participants, “If you could gain 37 dollars, do you think your partner would be willing to lose 54 dollars to let you get the money?”. For example, when participants gain 37 dollars with partner losing 54 dollars and participants’ answer is no, and participants gain 37 dollars with partner losing 46 dollars and participants’ answer is yes, we have the switch point of WTRs and participants’ WTR which is the average of these two WTRs. And if participants switch more than once, we will have the participants’ WTR as the average of all switch points. The definition of WTR difference is the difference between expected WTR and perceived WTR (expected WTR minus perceived WTR)

Table 1: Welfare tradeoff ratios scale

Amount of money at stake as decisions and possible welfare tradeoff ratios (WTRs)												
Amounts at Stake												
Self	Other	Self	Other	Self	Other	Self	Other	Self	Other	Self	Other	Possible WTRs
54	37	33	23	109	75	28	19	67	46	99	68	1.55
46	37	29	23	94	75	24	19	58	46	85	68	1.35
39	37	24	23	79	75	20	19	48	46	71	68	1.15
31	37	20	23	64	75	16	19	39	46	58	68	0.95
24	37	15	23	49	75	12	19	30	46	44	68	0.75
17	37	10	23	34	75	9	19	21	46	31	68	0.55
9	37	6	23	19	75	5	19	12	46	17	68	0.35
2	37	1	23	4	75	1	19	2	46	3	68	0.15
-6	37	-3	23	-11	75	-3	19	-7	46	-10	68	-0.05
-13	37	-8	23	-26	75	-7	19	-16	46	-24	68	-0.25
												-0.45

2.2.2. Different situations

To account for the social desirability bias [10], we will randomize two different situations shown to participants called a third-party situation for indirect questioning and self-report situation for direct questioning. In the self-report situation, we want participants to imagine their partner has exhibited infidelity behaviors. In the third-party situation, participants will imagine person A’s partner has engaged in infidelity behaviors.

The participants will be asked the following questions (the parentheses represent third-party situations): (i) feelings/emotions. Participants will rank a series of emotions like anger, sadness, shame and other emotions by responding to, “Rank the following emotions for your true feeling (for person A’s feeling you think) from 1 to 5, with 1 being the strongest and 5 being the weakest.” And all emotions will be rated, for example, participants will then answer an additional question, “To what extent are you angry (do you think person A is angry), rated from 1 to 7 with 1 being ‘very weak’ and 7 being ‘very strong’.” (ii) aggressive intent. Participants will rate the statement, “I (I think person A)

can't control the urge to strike my (his) partner in this situation," from 1 to 7 with 1 being "strongly impossible" and 7 being "strongly possible". (iii) attitude toward violence. Participants will rate the statement, "I think it's acceptable and excusable for me (person A) to strike my (his) partner in this situation," from 1 to 7 with 1 being "strongly disagree" and 7 being "strongly agree". (iv) behavior of violence. Participants will rate the statement, "I (I think person A) will strike my (his) partner in this situation," from 1 to 7 with 1 being "strongly impossible" and 7 being "strongly possible."

2.3. Data analysis

First, we will pair up three factors which are WTR difference, anger and violence frequency, and we will examine the correlations of these three pairs. Subsequently, only when these three factors have correlations with each other, we will test a mediation model for these three factors as anger being the mediating role. Last, we will compare the behavior of the participants of two period for a longitude study to examine the correlation between the difference of WTR difference (WTR difference of period B minus WTR difference of period A) and the difference of violence frequency (violence frequency of period B minus violence frequency of period A).

3. Discussion

Our research aims to investigate the significant positive relationship between Welfare Tradeoff Ratios (WTR) differences and the possibility of intimate partner violence (IPV). Firstly, for the cross-sectional results, we predict that there will be a positive correlation between WTR difference and level of anger (shown by Fig.2). Additionally, we predict that the level of anger and frequency of IPV will also be correlated (shown by Fig.3). If WTR difference is positively correlated with anger, and anger is positively correlated with IPV possibility, then we derive that there is a positive relationship between WTR difference and IPV possibility (Shown by Fig.4). This means that an increase in WTR difference between individuals is expected to correlate with an increase in violent behavior; conversely, as WTR difference decreases, IPV possibilities decrease.

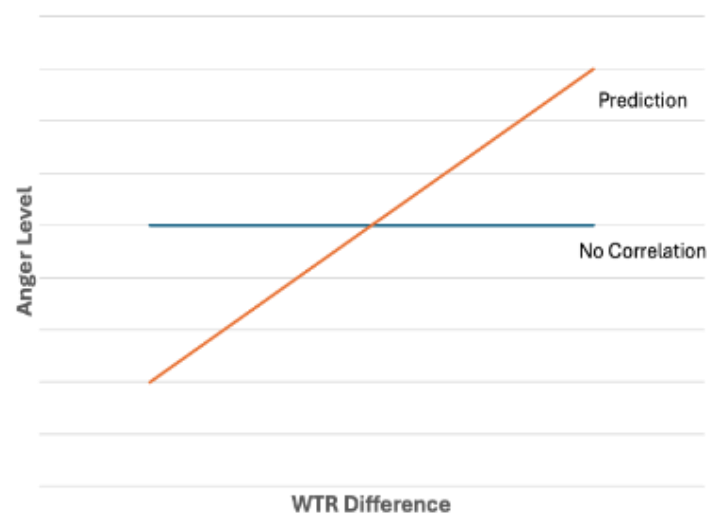


Figure 2: The correlation between WTR difference and anger

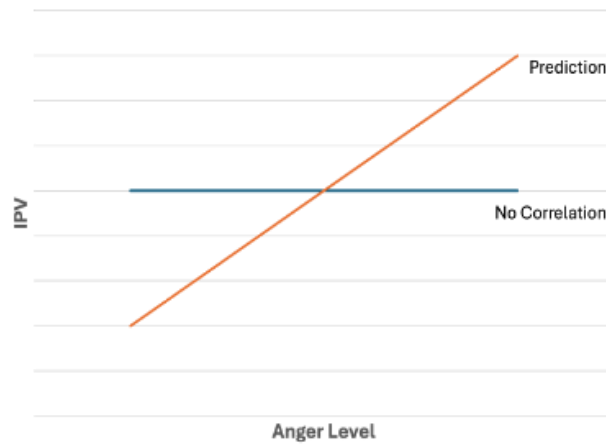


Figure 3: The correlation between anger and IPV

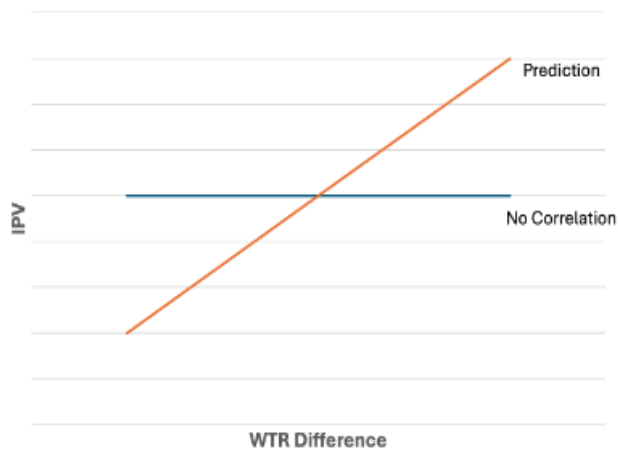


Figure 4: The correlation between WTR difference and IPV

For the longitudinal results, we predict that there will be a positive correlation between the difference in WTR difference and the frequency of IPV (shown by Fig.5). As the difference in WTR difference increases, the IPV frequency also increases. Vice versa.

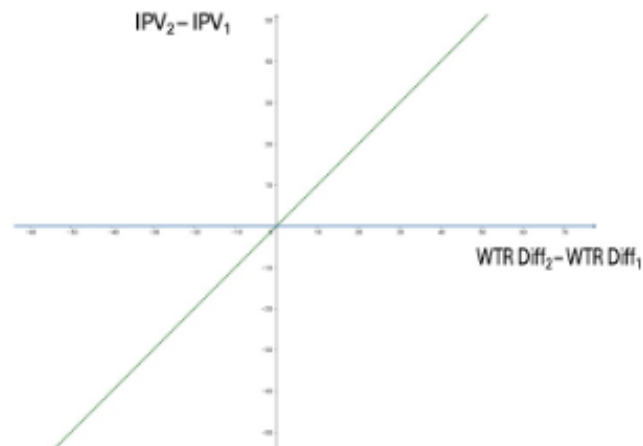


Figure 5: The correlation between the difference of WTR difference and IPV difference

If our predictions are validated that there is a positive correlation between WTR difference, anger and IPV frequency, we suggest that anger plays a mediating role. Shown by Fig.6, with the existence of anger, the direct effect of WTR difference and IPV frequency is significant. Instead, the route from WTR difference to anger to IPV will be prominent which means the indirect effect is significant. In this case, anger will act as an important triggering factor in causing IPV to become the form of mate guarding in solving the adaptive problem of paternal uncertainty and sexual jealousy. This is the most idealistic situation that this study pursues.

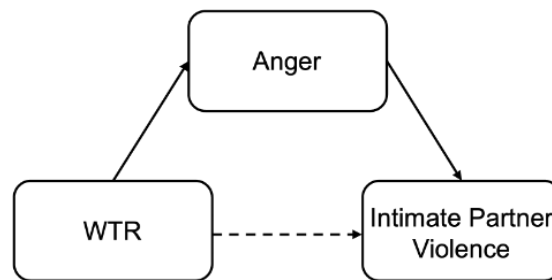


Figure 6: Full mediation effect of anger in the correlation between WTR difference and IPV

However, there is a situation where anger acts as a partial triggering factor. Shown by Fig.7, the direct effect of WTR difference and IPV and the indirect effect mediated by anger are both significant, indicating that anger does not have a complete effect in causing IPV to become a behavioral outcome. The potential reason for this case may be the existence of self-report bias in measuring WTR difference, anger or IPV. Additionally, it is also possible that there are other factors impacting the relationship between WTR difference and IPV. In this case, anger is a mediation between WTR difference and IPV but not the only mediation, which means IPV have more triggers and the mechanism from infidelity to IPV is more complicated.

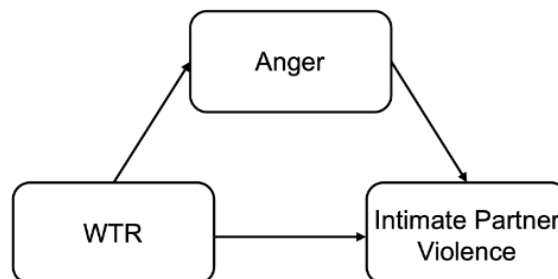


Figure 7: Partial mediation effect of anger in the correlation between WTR difference and IPV

In addition, there are situations where anger does not act as a triggering factor. In our model, there are three possibilities shown by Fig.8, Fig.9 and Fig.10. The direct effect of WTR difference and IPV is significant. However, the route that includes anger is incomplete which means the indirect effect mediated by anger is not significant. The potential reason for this case may be that anger isn't measured precisely. And it is possible that self-report bias occurs during the measurement of WTR difference or anger level. Also, there are other factors that cause IPV, but not anger. In this case, anger is not the key emotion that triggers the emergence of IPV, and anger can't play a mediating role between WTR difference and IPV. This is the worst situations that our study is pursuing, which means we fail to figure out the mechanism of IPV.

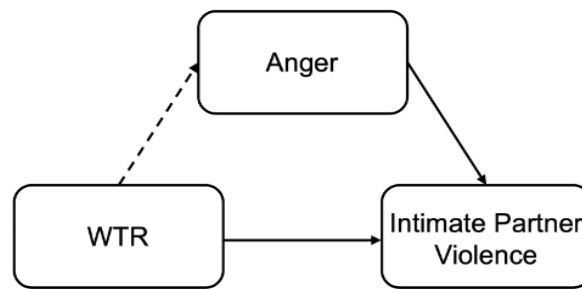


Figure 8: No mediation effect of anger in the correlation between WTR difference and IPV

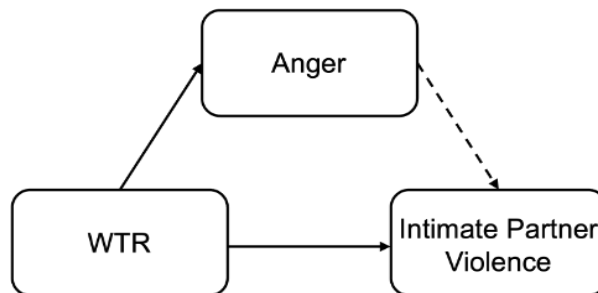


Figure 9: No mediation effect of anger in the correlation between WTR difference and IPV

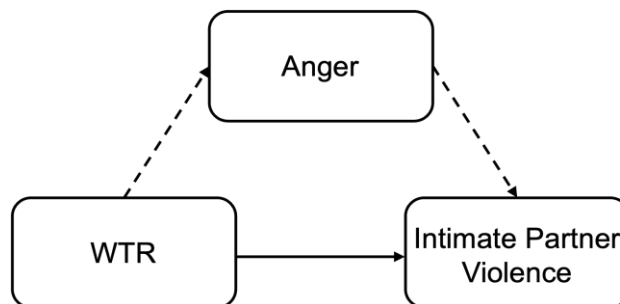


Figure 10: No mediation effect of anger in the correlation between WTR difference and IPV

4. Limitations and implications

Our study has several limitations. First, there is the issue of self-report bias, whereby participants may not accurately report their anger levels, WTR differences, or IPV behaviors due to social expectations, which may lead to underreporting or overreporting. Another limitation is that our study focused only on male participants, which limits the applicability of the findings to female or non-binary individuals. In addition, the survey could not be conducted globally because attitudes toward IPV vary across cultures, which also poses a limitation to the data collected. The purpose of our study was to gain an understanding of IPV from an evolutionary psychology perspective, which could help reduce WTR differences through a variety of means, such as improving communication with partners, thereby reducing the incidence of IPV.

5. Conclusion

From an evolutionary perspective, consistently occurring traits of organisms are either functional features of adaptations or byproducts of these adaptations. This study develops the theory that intimate partner violence results from design features of a ‘mate guarding’ adaptation that helps solve the problem of paternity uncertainty—aligning with observed sex differences, where males are more

likely than females to engage in intimate partner violence. This adaptation interacts with the psychological mechanisms that govern anger. As hypothesized, anger in these circumstances should result from the inference that one's partner would treat them worse than they think they should or deserve to be treated, and that violence should result from substantial gaps in this inference. According to this research, anger is a significant trigger of intimate partner violence, and disparities in the welfare tradeoff ratio (WTR) are likely to provoke anger. Intimate partner violence may decrease only when the WTR equilibrium is achieved—when the perceived treatment by a partner aligns with or exceeds the expected treatment.

References

- [1] Chester, D. S., & DeWall, C. N. (2018). *The roots of intimate partner violence. Current opinion in psychology*, 19, 55-59.
- [2] Goetz, A., & Shackelford, T. (2009). *Sexual conflict in humans: Evolutionary consequences of asymmetric parental investment and paternity uncertainty. Animal Biology*, 59(4), 449-456.
- [3] Buss, D. M., & Duntley, J. D. (2011). *The evolution of intimate partner violence. Aggression and Violent Behavior*, 16(5), 411-419.
- [4] Goetz, A. T., Shackelford, T. K., Starratt, V. G., & McKibbin, W. F. (2008). *Intimate partner violence. Evolutionary forensic psychology*, 65-78.
- [5] Salkicevic, S., Stanic, A. L., & Grabovac, M. T. (2014). *Good mates retain us right: Investigating the relationship between mate retention strategies, mate value, and relationship satisfaction. Evolutionary Psychology*, 12(5), 1038-1052.
- [6] Tooby, J., Cosmides, L., Sell, A., Lieberman, D., & Sznycer, D. (2008). *Internal regulatory variables and the design of human motivation: A computational and evolutionary approach. Handbook of approach and avoidance motivation*, 15, 251.
- [7] Sell, A. N. (2011). *The recalibrational theory and violent anger. Aggression and violent behavior*, 16(5), 381-389.
- [8] Birkley, E. L., & Eckhardt, C. I. (2015). *Anger, hostility, internalizing negative emotions, and intimate partner violence perpetration: A meta-analytic review. Clinical psychology review*, 37, 40-56.
- [9] Delton, A. W., Jaeggi, A. V., Lim, J., Sznycer, D., Gurven, M., Robertson, T. E., ... & Tooby, J. (2023). *Cognitive foundations for helping and harming others: Making welfare tradeoffs in industrialized and small-scale societies. Evolution and Human Behavior*, 44(5), 485-501.
- [10] Fisher, R. J. (1993). *Social desirability bias and the validity of indirect questioning. Journal of consumer research*, 20(2), 303-315.