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Early Manifestation of Antisocial Traits Predicting Recidivism Among First Timer Accused Indian Children: A Need for Layered Voice Analysis

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Abstract
The current study throws light on the assessment of recidivism, antisocial and psychopathic traits among first timer accused children. It discusses about the significance of vocal markers of children in conflict with law correlating with degree of recidivism, antisocial traits and make predictions based on that. It tries to establish a correlation between recidivism, antisocial traits, type of crime, and voice markers of such children and provide suggestions to reduce recidivism based on the findings. The major focus of the current study is to highlight the need and applications of LVA in Juvenile Recidivism Prevention.

Key words: antisocial traits, recidivism, voice analysis

Introduction
Recidivism is explained as a chronic criminal behaviour which may lead to several arrests and re-imprisonment of a person (Kalia, 2001). According to National Crime Record Bureau (NCRB) 2020 report of India, the juvenile crime rate reported in the years 2017, 18 and 19 is 3731, 3950 and 3817 respectively, whereas, the all India total is 33606, 31591 and 32235 in the years 2017, 18 and 19 respectively (NCERB, 2020). This data shows that crime rate in the past three years has not changed or reduced significantly. Somewhere it indicates either non effectiveness of rehabilitation services or ineffective social message resulting in consistency of such data. There are numerous studies conducted on juveniles concerning the mental health problems, neuro and developmental anomalies and social dynamics and the aspect of recidivism is as also found associated with variables such as demographic, behavioral, familial, school-related, and crime-related variables (Myner et al. 1998). However, particularly in Indian context, juvenile recidivism is evidently much less recognised (Pegu, 2021) which is throwing a major challenge for the Indian juvenile justice system and the society at large. Moreover, voice analysis being a strong biological predictor of mental health aspects is not explored on the said population and domain despite being still explored in other forensic domains. It is also evident that prevention is better than cure. Therefore, it is important to predict the possibilities of recidivism instead of investing many efforts in interventions after they make a major damage to self, society and legal system. Hence, the current study plans to predict recidivism through the acoustic markers and examine other psychopathological correlates of recidivism amongst juvenile delinquents. The study will be highly useful for the areas of forensic science laboratories, law and criminal justice system because it will provide a new insight to the government agencies which will be helpful in constructing new procedures and protocols for the said areas.
It is observed that juveniles are repeatedly involved in anti-social activities and subjected to incarceration. This possibility of repeated offending by serious offenders is higher (Cottle et al., 2001; Dembo et al., 1998). Previous research evidences show that the rate of recidivism is also associated with academic achievement

(Katsiyannis, Ryan, Zhang, & Spann, 2008). The rate of reoffending in juveniles is also found to be related with disability as the vulnerability is higher in this population (Barrett, et al., 2010; Zhang, Barrett, Katsiyannis, & Yoon, 2011). In case of contact sex offenders, majorly two broad domains are emerged as higher risk factors, which are antisociality and atypical sexuality (Eke et al., 2011). Further it was also observed that established criminological risk factors such as offender age and criminal history predict recidivism among child pornography offenders (Seto & Eke, 2005). Role of a substance abuse disorder is also found to be as a positive prognostic indicator for non-recidivism, Wierson & Forehand, 1995) whereas emotional disabilities predict recidivism for both sexes. Greater emotional disability is also signifies a greater risk for recidivism than lower emotional disability (Thompson & Morris, 2013). Some studies focus on gender role in recidivism concluding that risk factors of recidivism for males were different than risk factors of recidivism for females (Funk, 1999). These findings were consistent in the later observations also significant differences in risk factors of recidivism for females versus males were found different (Steketee, Junger, and Junger-Tas, 2013). However, despite these demographic variables, psychiatric and cultural factors being much explored and established in the field of criminology and investigation, there are contrasting views also available which do not support these findings where these variables are predictive of recidivism (Calley, 2012; Mulder, Vermunt, Brand, Bullens, & Marle, 2012; Tille & Rose, 2007, Dowden & Brown, 2002). But major research domain is in support of psychiatric and psychological factors having role in recidivism in delinquent adolescents (Vermeiram et al., 2002). Moreover, historical risk variables are found to be repeatedly associated with sexual recidivism in adolescents where previous offending and multiple or stranger victims are significant factors. However, a strong base of evidences is still awaited (Gerhold et al, 2017).

Why study recidivism?

A straight forward answer to the question posed is that academic research cannot find one single answer. A variety of interconnected factors can be seen causing recidivism, as discussed earlier. However, in association with these factors, variables such as poverty pre- and post- release from jail, easy monetary solutions, poor educational status, low wage and low earning capacity of the individual, poor employability, and stigma of labelled as a criminal.

The problem of Juvenile recidivism in India is not gained much attention. In India most of the studies have been conducted encompassing punishment (Sen, 2004), justice acts (Dey, 2014, Agarwal, 2018) relating to juvenile delinquents. Singh and Bose (1980) concluded that large family composition; inter-personal conflicts environment; the deprivation of adequate socio-economic and cultural background; the constant labelling of an individual as a deviant; rejection by the larger society are responsible for deviant patterns of behaviour (Singh & Bose, 1980). However, the literature in these studies is mostly based on foreign studies. A recent study conducted on risk factors associated with juvenile offenders' recidivism by Pegu in the current year 2021 is based on interventions to combat recidivism where the author has commented on stressful rehabilitative measures adopted for this population. The role of better rehabilitative measures is also recommended by the author which will lead to decreased rate of recidivism amongst juvenile offenders. Yet, studies cannot be found concerning the prediction of recidivism in juvenile offenders through any bio markers/s.

However, particularly in Indian context, juvenile recidivism is evidently much less recognised (Pegu, 2021) which is throwing a major challenge for the Indian juvenile justice system and the society at large. Moreover, voice analysis being a strong biological predictor of mental health aspects is not explored on the said population and domain despite being still explored in other forensic domains. It is also evident that prevention is better than cure. Therefore, it is important to predict the possibilities of recidivism instead of investing much effort in interventions after they make a major damage to self, society and legal system. Hence, the current study plans to predict recidivism through the acoustic markers and examine other psychopathological correlates of recidivism amongst juvenile delinquents. The study will be highly useful for the areas of forensic science laboratories, rehabilitation centres, law and criminal justice system because it will provide a new insight to the government agencies which will be helpful in constructing new procedures and protocols for the said areas.

Layered Voice Analysis (LVA) and its need:

is a technology that analyzes various properties of a person's voice to detect underlying emotions, stress levels, and deceptive behaviors. Unlike traditional voice stress analysis tools that primarily focus on psychological stress, LVA delves deeper into the emotional and cognitive states revealed through voice frequencies, modulations, and patterns. This technology is based on the premise that the human voice carries a wealth of information beyond the spoken words, including involuntary physiological and psychological changes that occur when a person experiences different emotions or attempts to deceive. The latest version, LVA7, represents a significant advancement in this field, as it extracts 151 subtle and uncontrolled biomarkers from the voice. These biomarkers are used to calculate 51 proprietary parameters that have been found through research to correlate with different key human emotions, such as stress, confusion, aggression, joy, and many more. This level of analysis allows for a nuanced understanding of a speaker's emotional state, providing valuable insights into their psychological wellbeing and potential behaviors.

LVA7 is the latest iteration in Layered Voice Analysis technology, brings forth enhanced capabilities that significantly extend its applicability in the realm of juvenile recidivism, particularly with its refined ability to detect aggressive behavior and energetic irregularities in speech that may indicate aggressive tendencies.

LVA7 harnesses advanced algorithms to analyze not just the emotional content of a voice but also the energy patterns and irregularities that often accompany aggressive states. This feature represents a significant leap forward, as it can identify not only the current emotional state of a speaker but also potential predispositions towards aggression. This capability is particularly valuable in a juvenile context, where early detection and intervention can alter a young individual's path away from recidivism.

Applications of LVA in Juvenile Recidivism Prevention

Early Detection of Aggressive Tendencies: By analyzing voice samples, LVA7 can identify juveniles who may be at risk of engaging in aggressive or violent behavior. This allows for early, targeted interventions that can address underlying issues such as anger management problems, frustration, or social conflicts that could lead to criminal activities.

Customization of Rehabilitation Programs: The insights gained from LVA7 analysis can help tailor rehabilitation programs to the specific needs of each juvenile. For those identified with aggressive tendencies, programs can incorporate specific modules on emotional regulation, conflict resolution, and positive social interactions.

Monitoring and Evaluation: LVA7 provides a means to continuously monitor the effectiveness of rehabilitation efforts over time. By assessing changes in the energy patterns and potential aggressive tendencies in a juvenile's voice, professionals can evaluate the progress of interventions and make necessary adjustments to support positive outcomes.

Supporting Positive Behavior: Beyond detecting aggression, LVA7's analysis of energetic irregularities can also identify moments of positive change and improvement in a juvenile's emotional state. This can reinforce positive behaviors and achievements, encouraging a continued path away from recidivism."

Conclusion

The results are expected to predict the recidivism among first time accused children, based on current anti-social traits through voice samples. Based in the obtained results from this project, the investigators will suggest action plans based upon the voice content of the juvenile to the Government of India. For example, those showing cognitive dissonance, a cognitive intervention will be suggested or if some someone shows stress, then the interventions to strengthen coping strategies will be suggested. Also, from the forensic and psychological point of view, we will recommend the concerned quarters to take significant precautionary steps to prevent recidivism. Based on these suggestions, Government of India may undertake various programs to control recidivism in these juveniles.

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