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Linking Rehabilitation and Re-integration Process to examine Re-offending Behaviour

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SCHOOL OF SOCIAL SCIENCES

**A thesis submitted to the Nanyang Technological University in
partial fulfilment of the requirements for the degrees of Master of
Arts**

2019

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I certify that all work submitted for this thesis is my original work. I declare that no other person's work has been used without due acknowledgement. Except where it is clearly stated that I have used some of this material elsewhere, this work has not been presented by me for assessment in any other institution or University. I certify that the data collected for this project are authentic and the investigations were conducted in accordance with the ethics policies and integrity standards of Nanyang Technological University and that the research data are presented honestly and without prejudice.

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ABSTRACT

Risk-Need-Responsitivity (RNR) framework is one of the most widely applied framework in correctional rehabilitation. It is common for offenders to present multiple needs for intervention, however, RNR framework provide little guidance on the design for intervention programs in such cases. Especially for drug offenders, the well-documented relationship between drug and crime suggest inter-play between drug abuse and criminal thinking. Apart from the drug-crime nexus, familial relationship supports the rehabilitation journey for drug offenders. The current study examined whether change via an intervention that targets the three areas could be related. Secondary data from 327 male inmates above the age of 18, incarcerated due to drug-related offence was used. The data was collected as part of a larger evaluation study on interventions for drug offenders by Singapore Prison Service. The results suggested that better familial relationship at pre-intervention could increase the rate of change for criminal thinking and drug abuse. Rate of change in criminal thinking and drug abuse were positively correlated, suggesting that the two needs could be targeted together.

CHAPTER I: INTRODUCTION

Background

Drug abuse is a chronic disorder which compulsive drug-seeking and drug-taking behaviour persists despite potentially serious negative consequences to both physical and mental health. Continued use of addictive substances induce changes in the brain that lead to various symptoms of addiction (American Psychiatric Association, 2013).

Singapore adopts a harm-eradication on drugs, which consist of preventive education, law enforcement activities and rehabilitation (CNB, 2016; CNB, 2015). As stated under Misuse of Drugs Act, Singapore (Rev. ed. 2008), punishment for drug consumption is categorized into rehabilitation order and imprisonment. Drug rehabilitation order is open to individuals with one or no previous counts of drug consumption. Individuals with two or more counts are considered recalcitrant as they expended the chances given to them previously. Therefore, from the third drug consumption case onwards, imprisonment with caning is meted out in a progressive manner that corresponds to the number of previous drug consumption cases.

Based on published statistics released by Singapore Prison Service (2011; 2015), close to 50 percent of the admissions into prison were offenders with a drug-related index offense (i.e. most serious offense in the offender's case) from 2011 to 2015. Between 2009 and 2013, 28 to 31 percent of individuals who served drug rehabilitation order were re-imprisoned within two-years from release. The statistics reflect the well-documented relationship between drug abuse and criminal behaviour observed in extant literature. Drugs potentially heighten offenders' re-offending risk, therefore, drug abuse rehabilitation for criminal offenders within an incarcerated setting is crucial (Casey & Day, 2014; Hakansson & Berglund, 2012).

Correctional rehabilitation framework: RNR

Risk-Need-Responsitivity (RNR) framework was developed to guide development of correctional programs to reduce recidivism (Andrews & Bonta, 2010) and is one of the most widely applied framework in correctional rehabilitation. RNR refers to three principles, Risk, Needs and Responsivity. Adherence to these principles increase effectiveness of programs to reduce recidivism (Andrews & Bonta, 2010).

Under RNR framework, interventions delivered should be proportional and positively correlated with risk level. Interventions should target criminogenic needs or factors that are related to criminal behavior. Responsitivity indicates that interventions should be delivered using evidence-based methodologies and unique requirements of offender that affect outcome of interventions have to be considered.

Through meta-analysis, relative importance of eight factors, prior antisocial behavior, antisocial attitudes, antisocial personality, antisocial associates, problematic circumstances with employment, problematic circumstances in marriage/family, problematic circumstances in leisure/recreation time, and substance misuse were identified as important in understanding criminal behavior. Within this group of variables, antisocial behavior, antisocial attitudes, antisocial personality and antisocial associates formed the Big Four, which were suggested as major correlates of individual criminal behavior (Andrews & Bonta, 2006). Thus, interventions delivered are expected to modify or diminish these factors to result in reduction of future criminal behavior (Andrews & Bonta, 2010). Dependent on assessment outcome, offenders may therefore receive interventions to target multiple risk factors identified. Apart from prior antisocial behavior, the remaining seven factors are viable targets for intervention (Table 1; Bonta & Andrews, 2007).

Table 1
Criminogenic needs in RNR framework

Needs	Indicators	Intervention goals
Antisocial personality pattern	Impulsive, adventurous pleasure seeking, restlessly aggressive and irritable	Build self-management skills, teach anger management
Procriminal attitudes	Rationalizations for crime, negative attitudes towards the law	Counter rationalizations with prosocial attitudes; build up a prosocial identity
Social supports for crime	Criminal friends, isolation from prosocial others	Replace procriminal friends and associates with prosocial friends and associates
Substance abuse	Abuse of alcohol and/or drugs	Reduce substance abuse, enhance alternatives to substance use
Family/marital relationships	Inappropriate parental monitoring and disciplining, poor family relationships	Teaching parenting skills, enhance warmth and caring
School/work	Poor performance, low levels of satisfactions	Enhance work/study skills, nurture interpersonal relationships within the context of work and school
Prosocial recreational activities	Lack of involvement in prosocial recreational/leisure activities	Encourage participation in prosocial recreational activities, teach prosocial hobbies and sports

Meta-analyses showed that effective treatment programs adhere to the Risk, Needs, Responsitivity (RNR) principle (Lipsey & Cullen, 2007). Studies found that delivering services to higher-risk cases (Lowenkamp & Latessa, 2005; Lowenkamp, Latessa, & Holsinger, 2006) and interventions attending to criminogenic needs successfully reduce recidivism (Andrews & Bonta, 2006; Lipsey & Cullen, 2007). Finally, as indicated by responsitivity principle, cognitive-behavioral programs produce sizeable reductions in recidivism (Lipsey, Chapman, & Landenberger, 2001).

Although criminogenic needs appeared to direct intervention efforts, it is not without flaws. One of the major concerns about criminogenic needs is the assumption that needs are

independent of one another. Another area of concern is the assumption that each criminogenic need carries equal weight for each offender. Stated differently, each criminogenic need is equally important regardless of the demographic characteristics and criminal history of the offender. Recent studies began to challenge these assumptions by examining the relationship between criminogenic needs and relative importance of criminogenic needs to refine existing approach towards designing interventions. Findings from these studies suggested that some criminogenic needs were inter-related. Apart from offender's characteristics such as age and gender affecting relative importance of criminogenic needs, offender's needs may fluctuate across their sentence (Lombardo, McKernan & Simourd, 2006; van der Put, 2012; Wooditch, Tang & Taxman, 2015).

Drug rehabilitation for adult offenders

Incarceration-based drug treatment encompassed a wide range of programs, such as group and individual counselling, methadone replacement therapy and therapeutic communities. Results from meta-analysis (Farabee, Rawson, & Gawad, 2015) suggest that therapeutic communities are effective in reducing drug use and re-offending after release. Counselling programs are generally effective in reducing re-offending but not drug use. Methadone replacement therapy is useful with reductions in drug use but not re-offending.

Being a chronic disorder, drug rehabilitation is a long journey which continues outside of prison facility to maintain abstinence. Studies suggest that providing treatment programs and support services after release reduced drug use and re-offending (Farabee, Rawson, & Gawad, 2015). Apart from formal services, support from family is highly desirable. Aside from providing practical support such as financial and accommodation and emotional support (LaVigne, Vishner, & Castro, 2004), family relationships play an important role in solidifying of social norms (Hirschi, 1969).

This is especially so for drug offenders, as familial relationship and drugs intertwined closely (Klostermann & O'Farrell, 2013; Mowen & Visser, 2015). Drug abuse causes familial relationship distress and tension. On the other hand, family relationship problems may contribute to relapse after treatment as drugs served as a maladaptive coping mechanism. Therefore, drug abuse and familial relationship present a cyclical-like relationship where one serves as a precursor of the other, which leads to drug use relapse and sustain drug abuse behaviour (Klostermann & O'Farrell, 2013; Mowen & Visser, 2015).

This relationship between drug abuse and family function inspired the development of numerous treatments that emphasize the role of family in drug abuse rehabilitation which share two fundamental objectives. Firstly, family is harnessed to positively support the individual's effort to stop drug abuse. Secondly, promoting a pattern of family interaction that provides an environment supportive of long-term abstinence. Conceptualizations of family-based treatment framework for drug abuse typically come from one of the three perspectives: family disease approach, family systems approach and behavioural models (Klostermann & O'Farrell, 2013; Substance Abuse and Mental Health Services Administration, 2004).

Family disease approach views drug abuse as an illness of the entire family where two core components, codependence and enabling are seen to perpetuates drug abuse. The solution is for each family member to recognize that they have a disease and each participates in their own recovery program.

Family systems approach views drug abuse and family as having a reciprocal relationship. Drug abuse is best understood in the context of familial interactions and function. Stated differently, the interest is to understand how familial function is organized around and being affected by the problem of drug abuse. Treatment usually involves re-

structuring familial interaction patterns related to drug abuse to remove the role of drug abuse in familial relationships.

According to behavioral approach, drug abuse behaviour is learned in the context of social interactions and reinforced by individual's environment. Therefore, drug abuse is reinforced by antecedents and consequences within the family context, such as providing attention and protecting the individual from the negative consequences of drug abuse. Intervention usually involves guiding family to have positive interactions, improve communication skills and enhance problem-solving skills.

Given the relationship between drug abuse and family relationship, a large number of interventions integrated drug abuse treatment and family-based approach. These interventions had shown to be effective in desirable treatment outcomes such as initiating change and lower relapse rate (Keen, Oliver, Rowse, & Mathers, 2000; Klostermann, Kelley, Mignonne, Pusateri, & Wills, 2011; Klostermann & O'Farrell, 2013).

Drug abuse and criminal behavior

The relationship between drug and crime is well-documented and four primary models (Bennett & Holloway, 2005) were outlined to explain this relationship: 1) drugs cause crime, 2) crime causes drugs, 3) reciprocal relationship between drugs and crime and 4) common cause model.

The drugs causing crime model follows a medical view of addiction and usually takes the form of psychopharmacological model or economic motivation model, which assumes a direct link between drugs and criminal behaviour. In psychopharmacological model, the effects from drug consumed such as disinhibition, attention deficits and cognitive-perceptual distortions, affect result in crimes committed (Collins, 1990; Fagan, 1990). Under the economic motivation model (Goldstein, 1985), crimes were committed to feed their drug abuse habit.

The second model, crime causes drugs, assumed that deviant individuals are more likely to engage in social situations which encouraged drug use. Criminal lifestyle defines a context which is conducive to drug involvement (Hawkins, Catalano, & Miller, 1992). For example, knowledge of channels to obtain drugs and extra money generated from illicit activities support involvement drugs.

It is also plausible that drugs and crime share a reciprocal relationship where drugs and crime shared a causal link and mutually reinforcing as well. Drug abuse lead to more criminal behaviour and criminal behaviour lead to further drug use (Fagan & Chin, 1990). For example, crime may be viewed as a valid manner to obtain money for general expenditure. The crime was not committed out of compulsion by drugs, however, the money obtained may be used to buy drugs. When there is a need for drugs, more crimes will be committed to obtain money for drugs (Chaiken & Chaiken, 1990; Goldstein, 1981).

Finally, the common cause model suggest that drug abuse and crime do not have direct causal relationship. Instead, both shared common factors such as age, personality traits, peer influence and family circumstances, which contribute to occurrence of such behaviour (White, Brick, & Hansel, 1993). Environmental and situational factors such as disadvantaged neighborhood also fall under common cause model.

There is some empirical evidence to support each of the drug-crime models, suggesting that one model is not sufficient to explain drug-crime relationship. This could be due to heterogeneity in the types of drug taken, how long the individual was on a specific type of drug, and degree of involvement in criminal lifestyle for drug abuse offenders.

Involvement in criminal activities is linked to criminal cognitions or criminal thinking, which refers to rationalizations that individuals engaged to justify or support their offending behaviour (Walters, 2012). Criminal thinking is considered a primary target in correctional intervention and interventions had shown to be effective in reducing the level of

criminal thinking, which in turn lead to reduction in re-offending behaviour. Despite the well-documented relationship between drugs and crime, and the centre role of criminal thinking in correctional intervention, little empirical literature explored the relationship between criminal thinking, drug abuse and re-offending behaviour in drug offenders.

From the results of the limited studies detected while reviewing extant literature, criminal thinking and drug abuse appeared to be inter-related. One of the studies examined drug abuse as a moderator between criminal cognitions and recidivism. The results showed that individuals with lesser drug abuse symptoms presented moderate association between criminal cognition and recidivism but not for individuals with more drug abuse symptoms (Caudy, et. al., 2015). Findings from another study (Walters, 2012) examining criminal cognition as a mediator for the relationship between prior drug abuse and recidivism indicated that criminal cognition partially mediated this relationship. Although the role of drug abuse and criminal cognition was different in both studies, the findings support that the level of criminal cognition affects re-offending for offenders with drug abuse issues.

Multiple-target intervention for drug abuse offenders in prison setting

Taking the afore information together, drug use, familial relationships and criminal cognition has to be addressed to effectively reduce both re-offending risk and risk for drug relapse of drug abuse offenders.

Although programs that follow RNR principle demonstrate effectiveness in reducing recidivism, the programs evaluated or reviewed generally target single criminogenic need. Given that offenders may present multiple criminogenic needs, this raise questions on how to provide correctional case planning to address the criminogenic needs in order to achieve the best outcome for these offenders. For example, which criminogenic need should be addressed first and should interventions targeting each of the need be delivered sequentially or parallel to each other. However, there is a dearth of studies which examine multiple-target

intervention programs in prison setting.

While interventions which integrate family intervention and drug abuse treatment appeared to be effective in bringing about desirable treatment outcomes such as initiating change and lower relapse rate (Keen et al., 2000; Klostermann et al., 2011; Klostermann & O'Farrell, 2013), most of these integrated interventions are delivered within community setting where individuals have substantial opportunities to interact and work together with their immediate social context such as family, companions and work place. Given the restrictive nature of prison setting, interaction with the community at-large is greatly reduced which raise questions on whether findings from the community can be extended to prison setting. Adding on, such treatment which integrate family and drug abuse targets are grounded in family intervention models, which do not include criminal thinking.

Although recent studies (Wooditch, Tang & Taxman, 2015) began to examine multiple criminogenic needs presented by different criminal justice population such as probationers and jail inmates, the focus remained on explaining the relationship between respective criminogenic needs and how they relate to recidivism. Little information was generated on how multiple single-target intervention programs worked in conjunction to ultimately bring about criminal behavior change. Thus far, one study (Joe, et. al., 2012) evaluating effectiveness of six brief interventions for incarcerated drug offenders showed that intervention delivered to a specific target area may bring about change to a separate area that was not targeted. Although each offender only received one of the brief interventions, the findings suggested that change between criminogenic needs may be inter-related, where change in one need may affect the change in another need. Adding on, differential response to interventions and outcomes for individuals whom received the same intervention was less discussed. Considering that individual variability in age and criminal history affected relative importance of criminogenic needs (Wooditch, Tang, & Taxman, 2015), it would be

reasonable to expect that individuals may benefit differently from the same intervention and thus have different levels of change.

The Current Study

The current study seeks to add information to the area of integrated single-target interventions for incarcerated drug offenders by examining correlation in change between three targeted domains, familial relationship, drug abuse and criminal cognition. The study findings have implications for both practice and theory. Offenders usually present an array of criminogenic needs and providing rehabilitative programs that are able to address multiple needs is essential. However, there is a lack of research to inform multiple-target intervention development and case planning strategies, such as which needs should be targeted concurrently or sequentially to maximize gain from intervention and reduction in recidivism.

While RNR framework illustrates dynamic needs are related to recidivism, it provides little guidance on potential inter-play between these dynamic needs during programming. The current study attempts to elaborate the theory behind RNR by examining correlation in change between three of the dynamic needs as stated at the opening of this section. Study findings will add to the growing body of research work on potential effects of offender characteristics and other dynamic needs on the relationship between criminal thinking and recidivism as well.

From the points afore, three research questions arise:

Research question 1: What is the effect of age and extent of criminal history of offenders on change from intervention?

Research question 2: What is the relationship between change from intervention for the criminogenic factors, drug abuse, family relationship and criminal thinking?

Research question 3: Whether change from intervention for the criminogenic factors, drug abuse, family relationship and criminal thinking are able to predict re-offending?

CHAPTER II: METHODS

Dataset information

The data was collected as part of a larger evaluation study on interventions for drug offenders under Singapore Prison Service between January 2013 and July 2016. This section only described the data utilized for the purpose of this study.

The offenders received cognitive-behavioral based intervention program conducted in a group set-up, which consisted of 85 sessions during the last 10 months of their prison sentence. The intervention targets criminal cognition, substance abuse, familial relationship and other reintegration needs such as employment skills. Data for cognitive-behavioural based intervention was collected at three time points, before the intervention, completion of intervention and after six months in community using self-report questionnaires administered via paper-pen method in a group setting.

After inmates were released into community, they were placed under a 12-month supervision period which work and accommodation support were provided by SPS. Each individual was assigned a case worker whom provided the relevant support and consisted of minimum 10 face-to-face sessions spanned across 12 months. Over the entire supervision period, reintegration indicators such as accommodation and employment were collected based on individual's self-report. Corroboration with other sources to verify information would be conducted by case worker, if possible. Non-compliance with supervision requirements were collected by SPS as well. Examples of non-compliance include absence from case work sessions and non-response to calls made by officers.

Individuals who completed supervision successfully were monitored for one more year in the community. During this period, no questionnaires were administered as further support services, if any, were not provided by SPS. Only re-offending information such as date of re-admission and offence committed, was collected for these individuals. Up to the

point which the dataset was made available for this study, individuals had spent a total of 18 months in the community.

Participants

Secondary data from 327 high re-offending risk male inmates above the age of 18, incarcerated due to drug-related offence was used. Demographic information and criminal history of the offenders is provided in Table 2. Re-offending risk level of inmates was determined by SPS assessment protocols. Due to changes in data collection protocol during the course of the project, only 164 participants were administered the questionnaires related to familial relationship, drug abuse and criminal cognition.

Table 2
Demographic information and criminal history of the offenders in the dataset

	Minimum	Maximum	Mean	Standard Deviation
Age at release	26	67	46.7	7.75
Drug treatment order	0	9	3.68	2.03
Total number of charges (across sentences)	3	40	15.62	6.76
Variety of charges (across sentences)	1	8	2.84	1.32
	Minimum	Maximum	Mean	Standard Deviation
Number of charges for each crime type (across sentences)				
Crime against Person	0	4	.22	.65
Commercial	0	12	.26	1.15
Crime against public order	0	6	.26	.76
Customs	0	7	.45	1.23
Drug	3	28	10.45	4.36
Immigration	0	3	.04	.30
Other	0	7	.82	1.34
Property	0	11	2.24	2.60
Traffic	0	22	.87	2.90

Measures

The following subsection described the questionnaires used by SPS to collect data for the three needs targeted by group-based cognitive-behavioral intervention conducted within prison.

Texas Christian University – Criminal Thinking Scales (TCU-CTS). TCU-CTS (Knight, Garner, Simpson, Morey, & Flynn, 2006) consists of six subscales (total of 37 items) to assess for criminal cognition, which is associated with anti-social attitudes and future criminal conduct (Appendix A). Items are rated using a 5-point Likert-type scale (1 = disagree strongly, 2 = disagree, 3 = uncertain, 4 = agree, 5 = agree strongly). Final scores are obtained by averaging the ratings on items within each subscale (after reversing scores) then multiplying the mean score by 10 to rescale the final scores (final score range between 10 and 50).

Stimulant Relapse Risk Scale (SRRS). SRRS (Ogai, et al., 2007) consists of five factors on drug use and one factor on mental condition (total 35 items) to assess for drug relapse risk (Appendix B). Items are rated using a 5-point Likert-type scale (1 = disagree strongly, 2 = disagree, 3 = uncertain, 4 = agree, 5 = agree strongly). Final score is obtained by summing up the average ratings on items (after reverse scoring).

Family Communication and Family Satisfaction Scales. FACES-IV (Olson, 2011) measures dimensions of family cohesion and family flexibility based on the Circumplex model. Both Family Communication and Family Satisfaction scales are complimentary scales to FACES-IV that tap into related dimensions of the Circumplex model. As the questionnaires were purchased by SPS, we were unable to append the scales. Instead, examples of the items would be provided below, along with the brief description of each scale.

Family communication (Olson, 2011) consists of 10 items and measures the quantity

and quality of communication between family members. Final score is obtained by summing up the ratings on all 10 items and plot the percentile score on the plotting chart provided in the manual. Example of items are “Family members are very good listeners” and “Family members express affection to each other”.

Family satisfaction (Olson, 2011) consists of 10 items and measures the degree which family members feel happy and fulfilled with each other. Final score is obtained by summing up the ratings on all 10 items and plot the percentile score on the plotting chart provided in the manual. “The degree of closeness between family members” and “Family members concern for each other” are examples in the Family satisfaction scale.

Time point of scale administration. Figure 1 illustrates the measures administered at each time point and provides an overview of the dataset. For time point 1 and 2, the scales were administered while the offenders were in prison. Time point 1 and 2 also correspond to pre- and post-intervention, respectively. The offenders were supervised in the community for one year after they were released (i.e. from time point 2 to 4). The measures were administered in the community for time point 3.

Figure 1. Overview of dataset

Demographic and criminal history. Age of offender when he was admitted for the current sentence was used. For criminal history, total number of incarcerations, total number of penal incarcerations, total number of drug rehabilitation orders, admission date and release

date of each convicted sentence and offences convicted for each sentence were available. For sentences with more than one convicted offence, aggravated offence (i.e. the offence which attracted the most serious punishment) would be indicated in a separate column. A variety score was calculated based on the types of offences the inmate was incarcerated for before, across his entire criminal history. There are nine main categories of offences based on SPS categorization: Commercial, Crime against persons (CAP), Crime against public order, Customs, Drugs, Immigration, Property, Traffic and Others.

Non-compliance with supervision

Number of technical violations was provided as indicators for (non-) compliance with supervision conditions.

Dependent (outcome) variables

Follow-up information on re-incarcerated date and next offence type were provided up to 18 months in community. This allows the outcome to be tracked in two manners, re-imprisoned for any offence or re-imprisoned with drug consumption relapse. As the main objective of the study was to examine recurrence of criminal behaviour, the definition of re-imprisonment for any offence was used. The outcome was recorded at 6-month intervals, which yielded three time points for analysis (i.e. between 0 and 6 months, between 6 months and 12 months, between 12 months and 18 months in community).

Plan of Analysis

The current study aims to examine whether change via intervention between criminogenic needs could be correlated and whether change in the targeted criminogenic needs could be related to re-offending behaviour. Latent growth modelling framework was selected as it allows reflection of individual differences in the slopes and intercepts of the trajectories. Also, the ease of incorporating predictors of individual differences in trajectory allows for examining which factors exert effect on the rate of change.

Growth models can be estimated using Structural Equation Modeling (SEM) or Multilevel Model (MLM) framework. Given the interest to predict re-offending using change from intervention (i.e. slope term), SEM framework is selected as it can readily extend the basic growth model to predict re-offending.

Latent growth model. Basic growth model was generated for each questionnaire to establish whether change was present in the respective domains targeted. There are three pieces of information. Intercept represents the average attribute level at initial status, which refers to the first occasion of measure. The slope provides the average rate change and the direction of the change, example, increase or decrease. The last piece of information examines the relationship between initial status and rate of change. As there were only two time-points, only linear relationship may be examined. Age and criminal history was included as covariates to examine for effect on change in the respective domains.

Figure 2. Simplified representation for latent growth model

Parallel process growth model. Parallel process growth model was generated for each unique pair of targeted domains, resulting in five separate models. This was because if information from all three targeted domains were placed into one model, it would result in a relatively complex model, which may be challenging to stabilize and troubleshoot.

Parallel process growth model examines two individual growth models together, where each growth model represents one attribute of interest. In a parallel process growth model, there are three areas of interest. The relationship between average initial status of both attributes (represented by a.). The relationship between average initial status of one attribute affecting the rate of change in another attribute (represented by b.). Lastly, The relationship between rate of change of both attributes.

Figure 3. Simplified representation of parallel process growth model

Extending latent growth model. The growth model intercept and slope from each questionnaire (i.e. the first step of the analysis) were used as independent variables to predict re-offending in community. All the LGM models would be estimated using SEM software, Mplus version 7 (Muthen & Muthen, 1998-2010).

CHAPTER III: RESULTS

Missing data

As with most longitudinal studies, there was missing data in the dataset. The main reasons were attrition and administrative-related issues such as incomplete set of questionnaires administered and administering at incorrect time point. Most of the attrition cases occurred while individuals were in the community and the cases fall into two broad categories, non-response and re-offended.

48% of individuals whom had not re-offended at 6-month collection point did not respond for self-report questionnaires. Apart from high non-response rate, it could not be ruled out that non-responders had begun to re-offend and were trying to evade the authorities. Taking the above information together, the missing data may present not-missing-at-random (NMAR) concerns. This means that techniques to handle missing data such as multiple imputation, could not be applied to the dataset. Considering the concerns presented, questionnaire data collected at 6-month in community would not be used in this study to examine change from intervention and effect of change on re-offending.

Descriptive statistics and CFA for measures

Descriptive statistics and correlation for the measures are presented in Table 3. Before conducting LGM, factor structure for TCU-CTS, SRRS, FC and FS was examined for both time points. Model fit was assessed using CFI (i.e. comparative fit index) and SRMR (i.e. absolute fit index), following Hu and Bentler (1999) recommendation of using two-index representation. There were other two-index combinations proposed, however, given the other combinations included fit indices sensitive to sample size, the combination of CFI and SRMR was used in this study.

Table 3

Descriptives and correlations for the measures

	CTS1	CTS2	SRRS1	SRRS2	FC1	FC2	FS1	FS2
CTS1	1.00							
CTS2	0.58**	1.00						
SRRS1	0.39**	0.17*	1.00					
SRRS2	0.38**	0.58**	0.28**	1.00				
FC1	-0.21*	0.01	-0.21*	0.02	1.00			
FC2	-0.15*	-0.07	-0.25**	-0.09	0.36**	1.00		
FS1	-0.23**	-0.05	-0.25**	-0.03	0.77**	0.34**	1.00	
FS2	-0.11	-0.04	-0.19	-0.06	0.40**	0.73**	0.41**	1.00
Mean	119.19	114.95	68.63	63.62	30.43	39.03	33.09	36.66
SD	21.37	25.16	12.78	13.75	4.61	5.14	5.75	6.05
Var	456.73	633.01	163.36	189.01	21.28	26.47	38.22	38.85

Note. ** $p < .01$; * $p < .05$; CTS=Criminal thinking; SRRS=Drug abuse; FC=Family communication; FS=Family satisfaction. The numbers “1” and “2” after each measure denotes the time point of administration.

Following the scale developer’s report for TCU-CTS, separate single-factor CFA models were fitted for each subscale. All the subscales showed acceptable fit in both absolute (SRMR <.08) and comparative fit (CFI >.90) indices except for cold-heartedness for both time points. As a result, cold-heartedness subscale was dropped from further analysis. Both FC and FS showed very good fit in both absolute (SRMR < .05) and comparative fit (CFI > .95) indices. There are six subscales in SRRS but one of the subscale is for treatment planning and does not count towards substance abuse severity. The five-factor CFA model for SRRS was of poor fit. EFA was conducted for both time points separately and based on the findings, we arrived at a final three-factor solution with 19 items.

Longitudinal measurement invariance was conducted as well to examine if the latent variables and their manifest indicators were invariant across measurement occasions. All the four questionnaires showed metric invariance, which was sufficient to proceed to examine changes in the latent factor.

An intercept-only LGM (i.e. no growth model) was fitted as the baseline model and the model fit was poor as indicated by the large chi-square value (Chi-squared=41.0, df = 16, $p < 0.001$) and poor model fit indices (SRMR = .10, CFI = 0.75). Thus, the intercept-only

model was rejected and the slope factor was added into the model. the chi-squared difference between the intercept-only model and linear growth model is significant (Chi-squared=27.1, $df = 3$, $p < .001$), indicating that was an improvement to the model with the inclusion of a linear growth term.

Change from intervention

The results (Table 4) indicated an average decrease in both criminal thinking and drug relapse risk score after receiving intervention, which was in the desirable direction. Negative correlation between initial status and slope showed that higher the initial score, the lower the rate of change. This suggested that individuals who present higher pre-intervention score in criminal thinking and drug abuse gained lesser from the intervention.

An average increase in both FC and FS score after receiving intervention was observed. Negative correlation between initial status and slope showed that higher the initial score, the lower the rate of change. There are two possible reasons for the negative correlation observed. One possibility is that individuals who present higher pre-intervention score in FC and FS gained lesser from the intervention. Another possibility is that scores of FC and FS were close to the ceiling of the questionnaire (i.e. maximum score possible). FC and FS contained 10 items with maximum score of 50. Individuals with high pre-intervention score may had benefited from the intervention equally well but the ceiling of the questionnaire prevented recording of any higher score.

Table 4
Growth Model Results

Variable	Mean Intercept (i)	Mean Slope (s)	i correlate with s
Criminal thinking	119.10	-0.42	-0.32
Drug relapse risk	68.66	-0.50	-0.56
Family communication (FC)	30.43	0.86	-0.50
Family satisfaction (FS)	33.09	0.34	-0.53

Note: All values are significant at $p < .05$.

Individual factors affecting change from intervention

From the observed findings (Table 5), variety of charges showed significant positive relationship with initial status for criminal thinking, drug relapse risk and FC while initial status of FS and variety of charges shared a negative relationship.

For change from intervention, only family communication showed a significant negative relationship with variety of charges. The finding suggested that rate of change from intervention was lower for offenders with a larger variety of charges in their criminal history.

Table 5
Results for Growth Model with Covariates

Variable	Model parameter	Admission age	Total incarceration	Total charges	Variety
Criminal thinking	i	-0.007	-0.001	1.666**	0.091**
	s	-0.009	0.046	-0.445	0.051
Drug relapse risk	i	0.112	-0.999	-1.453	0.919**
	s	0.001	0.128	-0.432	-0.074
Family communication (FC)	i	-0.106	-0.293	-11.493	0.570**
	s	0.016	0.032	1.283	-0.072**
Family satisfaction (FS)	i	0.037	-0.017	2.858	-0.186**
	s	0.000	0.011	0.238	0.004

Note: ** = $p < .05$; i = Initial status; s = Slope

Correlation in change between rehabilitation and reintegration

Both criminal thinking and drug abuse showed negative correlation with FC and FS (Table 6). Criminal thinking and drug relapse risk initial status were positively correlated. Initial status of criminal thinking and drug relapse risk did not present any statistically significant relationship with rate of change of FC and FS. Neither did initial status of criminal thinking present significant relationship with drug relapse risk.

However, initial status of FC and FS presented statistically significant relationship with rate of change in criminal thinking and drug abuse. Higher initial score of FC and FS contributes positively to rate of change in criminal thinking and drug relapse risk. Initial score of drug relapse risk also present statistically significant relationship with rate of change in criminal thinking, where higher initial drug relapse risk score contributed negatively to rate of change in criminal thinking. Only criminal thinking and drug relapse risk rate of change was positively correlated, indicating that the higher rate of change in criminal thinking, the higher the rate of change in drug relapse risk.

- a.: Initial status of Domain1 (D1) correlated to initial status of Domain2 (D2)
- b.: Initial status of Domain1(D1) related to rate of change in Domain2 (D2)
- c.: Initial status of Domain2 (D2) related to rate of change in Domain1 (D1)
- d.: Rate of change in Domain1 (D1) correlates with rate of change in Domain2 (2)

Figure 4. Simplified Representation of Parallel Process Growth Model

Table 6
Results for Parallel Growth Model

Domain1	Domain2	a.	b.	c.	d.
Criminal thinking	Family communication (FC)	-0.23**	0.001	0.10**	-0.02
Criminal thinking	Family satisfaction (FS)	-0.21**	0.003	0.06**	0.02
Criminal thinking	Drug relapse risk	0.37**	0.01	-0.03**	0.36**
Drug relapse risk	Family communication (FC)	-0.17**	-0.001	0.05*	-0.04
Drug relapse risk	Family satisfaction (FS)	-0.22**	0.01	0.03*	-0.02

** = $p < .05$, * = $p < .10$.

Taking the information together, there were three main findings. Firstly, initial status of FC and FS affects rate of change in criminal thinking and risk for drug relapse. This suggests that familial relationship may affect amount of change in criminal thinking and risk for drug relapse through intervention. Secondly, change in FC and FS was not correlated with change in criminal thinking and risk for drug relapse, which suggests that familial relationship may have separate change process from criminal thinking and risk for drug relapse. Lastly, it appeared that criminal thinking and risk for drug relapse may not share a two-way relationship. Considering that both initial status and rate of change of criminal thinking and risk for drug relapse were positively correlated, it was expected that the effect of initial status on rate of change would show similar relationship. However, that was not the case; initial status of risk for drug relapse presented a negative relationship with rate of change in criminal thinking but initial status of criminal thinking did not have significant relationship with risk for drug relapse rate of change.

Change from intervention predicts outcomes in community

Reoffending information was collated every six months in community up to 18 months in community. Table 7 showed the number of offenders at the beginning of each timeframe and the number of re-offenders during the corresponding timeframe. The number of re-offenders in the overall timeframe of 0 to 18 months was obtained by summing the number of re-offenders in each timeframe.

During community supervision, non-compliant behaviours are generally termed violations. Apart from change from intervention, separate models were constructed for 6 – 12 month and 12 – 18 month timeframes to include number of violations as one of the factors that predict re-offending (Figure 5).

Figure 5. Simplified Representation for Extended Growth Model

Table 7
Overview of number of offenders and re-offenders in each timeframe

Timeframe	No. of offenders at beginning of timeframe	No. and percentage of re-offenders in the timeframe
0 to 18 months	157	51 (32.5%)
0 to <6months	157	16 (10.2%)
6 to <12 months	141	22 (15.6%)
12 to 18 months	119	13 (10.9%)

Note: The numbers of offenders available in the following analysis differ from the numbers above due to missing data in their questionnaires.

Neither change from intervention nor initial status of the three targeted criminogenic needs predicted re-offending during the overall timeframe of 0 to 18 months (Table 8). However, change from criminal thinking predicted re-offending during first six months (i.e. 0 – 6 months; Table 9) and during the last six months (i.e. 12 – 18 months; Table 11). The findings suggested that on average, offenders who showed more change in criminal thinking were less likely to re-offend during the first six months but more likely to re-offend during the last six months.

Table 8
Re-offend between 0 and 18 months in community (n = 157)

	Criminal thinking	Drug abuse	Family communication (FC)	Family satisfaction (FS)
Mean intercept (i)	23.84**	40.61**	30.43**	33.09**
Mean slope (s)	-0.08**	-0.39**	0.86**	0.36**
i correlate with s	-0.32**	-0.55**	-0.50**	-0.53**
Reoffend on i	0.02	0.01	-0.04	-0.02
Reoffend on s	-0.18	0.04	-0.08	0.01

** = $p < .05$

Table 9
Re-offend between 0 and 6 months in community (n = 157)

	Criminal thinking	Drug abuse	Family communication (FC)	Family satisfaction (FS)
Mean intercept (i)	23.84**	40.61**	30.43**	33.09**
Mean slope (s)	-0.08**	-0.39**	0.86**	0.36**
i correlate with s	-0.32**	-0.55**	-0.50**	-0.53**
Reoffend on i	0.12**	0.02	-0.02	-0.01
Reoffend on s	0.71*	0.24	0.06	0.06

** = $p < .05$, * = $p < .10$

Table 10

Re-offend between 6 and 12 months in community

	Without violations				With Violations			
	CT (n=139)	Drug (n=138)	FC (n=126)	FS (n=125)	CT	Drug	FC	FS
Mean intercept (i)	23.55**	40.63**	30.60**	33.60**	23.65**	40.96**	30.94**	34.06**
Mean slope (s)	-0.09**	-0.43**	0.84**	0.31**	-0.08*	-0.41**	0.81**	0.30**
i correlate with s	-0.34**	-0.58**	-0.49**	-0.45**	-0.35**	-0.59**	-0.48**	-0.45**
Reoffend on i	-0.05	0.01	-0.05*	-0.02	-0.05	0.01	-0.05	-0.01
Reoffend on s	-0.22	0.08	-0.32	-0.07	-0.21	0.09	-0.33	-0.07
Reoffend on violations					0.20	0.19	0.16	0.15

Note: ** = $p < .05$; * = $p < .10$; CT = Criminal thinking; FC = Family communication; FS = Family satisfaction

Table 11

Re-offend between 12 and 18 months in community

	Without violations				With Violations			
	CT (n=117)	Drug (n=116)	FC (n=105)	FS (n=104)	CT	Drug	FC	FS
Mean intercept (i)	23.79**	40.56**	30.82**	33.71**	23.63**	40.61**	30.81**	33.79**
Mean slope (s)	-0.09*	-0.43**	0.85**	0.31**	-0.08*	-0.45**	0.86**	0.32**
i correlate with s	-0.35**	-0.60**	-0.47**	-0.44**	-0.32**	-0.60**	-0.47**	-0.41**
Reoffend on i	0.02	0.01	-0.01	-0.01	0.03	0.01	-0.01	-0.01
Reoffend on s	-0.75**	-0.20	0.18	0.11	-0.75**	-0.18	0.19	0.13
Reoffend on violations					-0.01	-3.79	0.39	0.38

Note: ** = $p < .05$; * = $p < .10$; CT = Criminal thinking; FC = Family communication; FS = Family satisfaction

CHAPTER IV: DISCUSSION

The study set out to examine whether change via interventions between criminogenic needs could be correlated. Using a drug offender dataset collected by Singapore Prison Service, the study was able to examine whether change between three criminogenic needs targeted by an integrated program namely, drug abuse, criminal thinking and familial relationships, were correlated. Differential response to intervention due to criminal history and demographic characteristics of the offender was examined followed by whether change from intervention affect re-offending.

Differential response to intervention

Higher variety of charges indicate the offender is versatile in their offending pattern, suggesting the individual is more entrenched in a lifestyle of crime. Therefore, it was not surprising to observe that variety of charges showed a positive relationship with initial status of criminal thinking and drug abuse.

However, it was unexpected to observe positive relationship between variety of charges and family communication. As the responses were self-report by offenders, it could be reflecting the offender's perception of his communication with family and did not represent that quality of communication between the offender and family members.

Correlation in change from intervention between criminogenic needs

From the results, it was observed that the three criminogenic needs targeted by intervention were related. Particularly, initial score of familial relationship was associated with both initial score and rate of change for criminal thinking and drug abuse. Although change in family relationship was observed, it was neither related to initial status nor change in criminal thinking and risk for drug relapse. This suggest that change process of familial relationship may be different from the other needs targeted by the intervention. This could be

related to the social nature of familial relationship, which requires interaction between members to develop and bring about change.

The main research question of correlation in change between criminogenic needs was only observed between criminal thinking and risk for drug relapse. This suggests that the change process for criminal thinking and drug abuse may be similar and inter-related. Interestingly, the initial status of criminal thinking did not have a significant relationship with drug relapse risk rate of change but initial status of drug relapse risk presented a negative relationship with rate of change in criminal thinking. This mean that the level of criminal thinking at the beginning of the intervention did not affect the average rate of change in drug abuse while higher risk for drug relapse at the beginning of the intervention showed a lower average rate of change in criminal thinking. This may suggest that the offenders in this sample identify themselves as drug abusers rather than hardened criminals, despite that they could have prior incarcerations. Therefore, the level of risk for drug relapse at the beginning of intervention affected the rate of change for criminal thinking.

Another possibility is the presence of two or more sub-groups of drug offenders in the sample showing different response to intervention. As discussed under drug-crime models, each of the four models have some empirical evidence supporting them, suggesting that there might not be a single model to explain drug-crime relationship. Adding on, separate studies that discussed the relationship between criminal thinking, drug abuse and re-offending also suggested presence of two types of drug abuse offender. One type commit crimes to support their addiction habit while the other type may have certain characteristics that are common to both drug abuse and criminal behaviour. The presence of sub-groups may dilute the observed relationship if it was not accounted for.

Change from interventions predict re-offending

Apart from rate of change in criminal thinking showing a relationship with re-offending during first six months (i.e. 0 – 6 months) and during the last six months (i.e. 12 – 18 months), change in risk for drug relapse and family did not appear to be predictive of re-offending. The growth model results showed that intervention brought desirable change in the targeted criminogenic needs, however, this change did not appear to translate into outcomes in community. There is a gap in our understanding between intervention gain and behaviour in the community. One possibility is that changes brought about by interaction between individual and community are more relevant to maintaining subsistence and remaining crime-free in the community. Decay of intervention gain where the effects of the intervention wear off may take place when the individual moved from a restricted and controlled setting to an open environment with more distractions and temptations.

The rate of change in criminal thinking appeared to have a different relationship with re-offending at selected timeframes in the community. The findings suggest that on average, offenders who showed more change in criminal thinking were less likely to re-offend during the first six months but more likely to re-offend during the last six months. This could mean that offenders who showed greater change in criminal thinking were generally more malleable to change hence the intervention gains they made while under prison treatment programs could be reversed after their release.

Practical Implications

Based on the results, interventions targeting family domain may be introduced earlier to increase gain from intervention that targets criminal thinking and drug abuse. Interventions targeting rehabilitative areas may be delivered during the same timeframe as their initial status and rate of change correlates.

However, the findings on the relationship between criminal thinking and drug abuse suggest it would be necessary to conduct further exploration on potential presence of sub-groups of drug abuse offenders. One possibility is to extract the full criminal history of the offenders in the sample to examine if there were distinct types of drug abuse offenders based on the past offences committed.

Limitations

Firstly, constraints were applied to generate results for the models as there were insufficient time-points for intervention data. Constraints are basically sacrifices made in the analysis process, to not request for certain pieces of information to be calculated. Constraints are not good as they are assumptions which we cannot test.

For the purpose of this study, the constraints were applied to the error terms for the questionnaires when fitting the growth models. It is not ideal to constraint error terms but given the amount of missing data and NMAR concerns, in order to address the research questions the slope (i.e. rate of change) had to be freed up. Due to the constraints applied to error terms, it would not be recommendable to directly apply the findings and make changes to existing intervention programs. The findings in the study were more suited to inform design of future studies aim at examining integrated interventions.

Secondly, the base line measurement of the participants was absent as they had been through two to three years of imprisonment before their pre-intervention score was taken. The base line measurement would be useful to establish the true initial status of the participants before other processes affect the respective criminogenic needs.

Lastly, related to the previous point, participants may have received other programs during early stages of incarceration, which could affect the targeted criminogenic needs. The dataset did not contain information that may serve as proxy indicators to account for potential effect of earlier programs the participants attended.

Conclusion

The study set out to examine correlation between change in criminogenic needs via intervention delivered in a prison setting for drug abuse offenders. The findings from the study add to the small but growing literature on intervention structure and approach for offenders presenting multiple criminogenic needs. Further exploration on the topic is required to address questions on the sequence of the criminogenic needs targeted and presence of sub-groups within drug offenders.

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APPENDIX A

TEXAS CHRISTIAN UNIVERSITY – CRIMINAL THINKING SCALES (TCU-CTS)

A. Entitlement (EN)

You deserve special consideration.
You have paid your dues in life and are justified in taking what you want.
You feel you are above the law.
It is okay to commit crime in order to pay for the things you need.
Society owes you a better life.
Your good behaviour should allow you to be irresponsible sometimes.
It is okay to commit crime in order to live the life you deserve.

B. Justification (JU)

You rationalize your irresponsible actions with statements like “Everyone else is doing it, so why shouldn’t I?”
When questioned about the motives for engaging in crime, you justify your behaviour by pointing out how hard you have been.
You find yourself blaming the victims of some of your crimes.
Breaking the law is no big deal as long as you do not physically harm someone.
You find yourself blaming society and external circumstances for the problems in your life.
You justify the crimes you have committed by telling yourself that if you had not done it, someone else would have.

C. Power Orientation (PO)

When people tell you what to do, you become aggressive.
When not in control of a situation, you feel the need to exert power over others.
You argue with others over relatively trivial matters.
If someone disrespects you then you have to straighten them out, even if you have to get physical with them to do it.
You like to be in control.
You think you have to pay back people who mess with you.
The only way to protect yourself is to be ready to fight.

D. Cold Heartedness (CH)

You get upset when you hear about someone who has lost everything in a natural disaster. ®
Seeing someone cry makes you sad. ®
You are sometimes so moved by an experience that you feel emotions that you cannot describe. ®
You feel people are important to you.
You worry when a friend is having personal problems. ®

E. Criminal Rationalization (CN)

Anything can be fixed in court if you have the right connections.
Bankers, lawyers, and politicians get away with breaking the law every day.
This country's justice system was designed to treat everyone equally. ®
Police do worst things than do the "criminals" they lock up.
It is unfair that you are imprisoned for your crimes when bank presidents, lawyers,
and politicians get away with their crimes.
Prosecutors often tell witnesses to lie in court.

F. Personal Irresponsibility (PI)

You are in prison now because you had a run of bad luck.
The real reason you are in prison is because of your race.
Nothing you do here is going to make a difference in the way you are treated.
You are not to blame for everything you have done.
Laws are just a way to keep people down.
You may be a criminal, but your environment made you that way.

Note: ® designates items with reflected scoring.

APPENDIX B

STIMULANT RELAPSE RISK SCALE (SRRS)

A. Anxiety and intention to use drug (AI)

The feeling I used to have while using the drug sometimes comes back.
There are times I want to use the drug.
I am anxious about reusing the drug.
Thinking about my family, I can no longer use the drug. ®
If my friend gives me the drug, I would use it even in the hospital.
If I have a large sum of money, I want to buy the drug.
I will use the drug in near future.
Even though I know I will be arrested, I would use the drug.

B. Emotionality problems (PM)

I feel a constant need to put something in my mouth.
I am annoyed by words from others.
I am irritated.
I am not motivated to do anything.
I feel lonely.
I am anxious about my future.
I cannot control my feeling.
I feel tired due to impatience.

C. Compulsivity for drug (CD)

I would do almost anything in order to use the drug.
I would do anything to get money for the drug.
I want the drug even if I have to steal.
I want to obtain the drug even by working illegally.

D. Positive expectancies and lack of control over drug (PL)

If someone holds the drug under my nose, I would not be able to refuse it.
I would use the drug if I am alone.
If the drug is placed in front of me, I would use it.
If I use the drug, I would be less nervous.
If I use the drug, I would feel everything is going well.
If I use the drug, I would feel invigorated.

E. Lack of negative expectancy for the drug (NE)

I feel easier than before. ®
I am afraid of hallucinations due to drug use. ®
I would not be able to control myself if I use the drug. ®
If I use the drug, it would badly influence my job. ®

F. Insight into illness

I can stop using the drug by myself ®

I would be fine without the drug. ®

I have already recovered from drug abuse. ®

I am confident that I would not use the drug again. ®

I think I am an addict.

Note:

- ® denotes reversal item.
- Item of “Insight into illness” is supplementary. Individuals with extremely low score of “Insight into illness” (e.g. average score is 1 point) may deny their illness.