PERSPECTIVE

Using Mathematical Formulae to Improve Correctional Effectiveness

Curtis R. Blakely
University of Wyoming, United States of America

Abstract
With recidivism rates at unacceptably high levels, greater effort is currently being devoted to discovering ways to improve correctional effectiveness. Traditional approaches that offer treatment in a non-targeted and haphazard fashion are proving wholly inadequate. Instead, newer approaches that are more scientifically oriented are being devised to identify those offenders that are amenable to, and who would benefit from, treatment. In this perspective article, one of these approaches is briefly outlined. It suggests that authorities must consider both individual and group-level variables when engaging in classification and the delivery of intervention strategies. It is recognized that correctional outcomes can be improved through the intentional and targeted delivery of treatment to those offenders most likely to benefit from educational, vocational and therapeutic participation.

Keywords: Amenability, Classification, Math, Recidivism, Rehabilitation, Specialization, Treatment.

Introduction
I am often asked how correctional intervention, in all its various forms, might be made more effective? The frequency at which I am confronted with this question has increased dramatically since becoming the managing editor of this journal. While there are no simple answers to this question, there is an approach that promises increased effectiveness by intentionally targeting and treating a subset of the offending population that is most likely to benefit from therapeutic intervention.

As a contemporary penologist with access to a great amount of scholarship, I find it interesting that few advancements have been suggested, developed or implemented in the
area of offender classification during the past fifty years. Classification is the process of determining an inmate’s security and treatment requirements. Many jurisdictions mandate classification at least annually; however, most offenders undergo the classification process more frequently, usually due to changes in work or living arrangements. Traditionally, classification dealt with assigning an inmate a security rating of maximum, medium or minimum. Of course, these designations were based on factors including one’s criminal record and propensity toward violence and had little to do with an offender’s likelihood for rehabilitation. Potential benefits resulting from educational, vocational and therapeutic services were a distant consideration.

As previously stated, a review of the extant scholarship reveals that the correctional apparatus has traditionally been reluctant to adopt new and innovative ideas. This hesitancy is more pronounced today than ever before. Corrections, to a greater extent than all other social services, has come to rely more heavily on rote activity than innovative practice. Its failure to invest in more progressive approaches has hindered its ability to reform offenders. In fact, one might argue that since correctional officials first began to classify and separate inmates based on sex, age and offense, few similar advances within classification have been adopted. One proposal that loosely serves as the basis for the remainder of this article is prison specialization – a historical practice that was based upon an assessment of an offender’s likelihood for rehabilitation.

**Prison Specialization**

Any proposal calling for the establishment of new approaches to offender classification are, in some way, based upon the creation of specialized prisons dating to the thirteenth century. It was then that correctional officials in London began to experiment with specialized prisons as part and parcel of their normal practice. While little scholarship exists to reveal the specifics of these early institutions, those records that do remain suggest that each specialized prison held a different type of offender. For example, some of these institutions housed less serious and less experienced offenders while others housed more serious, chronic and hardened offenders. This approach sought to identify those offenders that could benefit from treatment in an environment free from those that may, in some way, corrupt the process. In North America, the groundwork for specialization dates to the eighteenth century. It was then that officials of the Walnut Street Jail began to recognize that essentially two groups of offenders existed – those that could be rehabilitated and those that could not. These early practices solidified the belief that an offender’s attributes must be considered when determining his/her classification status and treatment plan. Overall, the ideas that initially drove specialization failed to gain popular support; nonetheless, the belief that some offenders are good candidates for rehabilitation while others are not has remained.

Leaping ahead to modernity, it still appears that offenders can be separated into two groups. These groups consist of those with the desire and capacity to undergo treatment (considered amenable) and conversely those who are opposed to treatment or otherwise not suited for such an undertaking (considered nonamenable). Thus, changes to existing classification processes require a determination to be made about the likelihood that a particular offender will be rehabilitated. As you can see, this approach runs counter to contemporary practices and is based upon the following observations:
• a great deal of diversity exists within the offending population,
• there are offenders who desire treatment (amenables) as well as those who oppose it (nonamenables),
• it must be determined into which group each offender belongs,
• once this determination is made, then appropriate approaches can be devised to address the unique needs of each offender – this specifically includes providing treatment to those that are most likely to benefit from therapeutic intervention, and
• when treatment is delivered in a targeted manner to those that are amenable, the chances for meaningful and lasting reform increases.

Thus, the basis for the historical practice of specialization rested on the premise that therapeutic intervention be provided only to amenable offenders in an environment largely free from those who either intentionally or unintentionally might degrade treatment processes. The contemporary equivalent to specialization is an approach that seeks to identify and assess a multitude of variables that when considered in a collective manner, provides added insight into the likelihood that an offender will be reformed. Such an approach not only identifies and assesses pertinent variables, but by using specially designed formulae, can determine the overall effect that these variables have upon offender success.

**Variables and Formulae**

I have learned over the course of my career that two types of variables directly impact correctional outcomes. First, there are individual-level variables (which I refer to as A1) that pertain to an offender’s internal characteristics including his/her personality, experiences, knowledge and amenability. These variables are often exhibited in actions, interactions and behaviors. Secondly, there are group-level variables (which I refer to as A2) that pertain to external factors including the quantity, quality and types of support available to an offender from his/her family, community, employer and the correctional apparatus itself. These variables include investments of time, resources and expertise – all of which prove critical to rehabilitation.

In order to increase understanding across social, cultural and national boundaries (after all we are an international journal), it is best to present this proposal in a mathematical form. This approach requires officials to place each variable under consideration on a scale that indicates both its presence and overall strength – this is done by assigning each variable a numerical value. This process can be modified to fit the unique mission of each correctional agency regardless of the country in which it operates. For an offender to have the best possible chance at rehabilitation, the A1 and A2 scores must be as close to 100 as possible (a one hundred-point scale is suggested due to its ease of use). As a variable’s score increases, so too does its ability to have a positive effect on rehabilitation. Conversely, as a variable’s score decreases, the chance that it will have a positive effect on rehabilitation also decreases. This form of assessment differs markedly from current approaches used worldwide since it seeks to determine the presence and strength of both internal/individual and external/group factors that impact treatment. For example, I am not aware of any current assessment process that specifically takes an offender’s amenability into consideration or the types and degrees of family or correctional/community support...
available. To quantify these variables and for the sake of this brief introduction, I suggest using a scale that looks like this:

<table>
<thead>
<tr>
<th>Score</th>
<th>Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>None</td>
</tr>
<tr>
<td>25</td>
<td>Marginal</td>
</tr>
<tr>
<td>50</td>
<td>Good</td>
</tr>
<tr>
<td>75</td>
<td>Excellent</td>
</tr>
<tr>
<td>100</td>
<td>Exceptional</td>
</tr>
</tbody>
</table>

This scale can be used to quantify any and all A1 and A2 variables that officials deem appropriate. For example, to use this scale to quantify offender amenability, it would appear reasonable to interview the offender as well as his/her family and friends. This would provide a basis for determining the presence and overall strength of this variable. After determining where on our scale this variable is located, then a numerical value would be assigned. If an offender’s amenability toward treatment is strong, perhaps the score may be assessed as falling somewhere within the Excellent to Exceptional range (75 – 100 points). Likewise, if family support is determined to be weak or nonexistent, with little or no encouragement or assistance being offered, it may fall into the None to Marginal range (0 - 25 points). Once this process has been completed for all variables under consideration, these numbers are then inserted into a formula to arrive at a Total Score (TS) that can then be used to determine an offender’s overall probability for rehabilitation. This score would help officials determine whether treatment is appropriate and if so, the types of treatment that may be warranted as well as an offender’s housing assignment (if incarcerated). For example, lets agree that our offender, which we will call John, is a highly motivated (OM)* inmate that will be paroled shortly. John expects to succeed in his treatment program and is committed to success (OEC)*. Given these factors, the equation that assesses those individual-level/internal variables that may affect John’s likelihood for success might resemble the following:

\[
A1 = \frac{(OM + OEC)}{200} \quad \text{or} \quad A1 = \frac{(85 + 81)}{200} \quad \text{or} \quad A1 = .83 \ (83\%)
\]

Furthermore, if John has a considerable amount of family support (FS)*, has access to quality prison resources (PR)* and community corrections support when paroled (CCS)*, the equation that assesses those group-level/external variables might resemble the following:

\[
A2 = \frac{(FS + PR + CCS)}{300} \quad \text{or} \quad A2 = \frac{(81 + 77 + 79)}{300} \quad \text{or} \quad A2 = .79 \ (79\%)
\]

Once the A1 and A2 scores have been determined, it then becomes time to formulate a Total Score (TS) denoting the overall probability for John to achieve a rehabilitated state. This equation (using the above scores) would resemble the following:

\[
TS = \frac{(A1 + A2)}{200} \quad \text{or} \quad TS = \frac{(83 + 79)}{200} \quad \text{or} \quad TS = .81 \ (81\%)
\]

In this example, John has a TS of 81% which indicates that he has an Excellent to Exceptional chance of being reformed. Therefore, the correctional apparatus should devote its full (but finite) resources toward assisting him to achieve a rehabilitated state.

For example, since John is an inmate, appropriate institutional resources should target his unique needs. Then upon release, community-based officials would continue treatment, supplementing the types of assistance and support that John was given while
incarcerated. If John’s TS had been significantly lower, the correctional apparatus might have instead supervised and/or incapacitated him until he either completed his sentence or was able to increase his Total Score. This approach allows officials to specifically target that segment of the offending population that has the greatest probability of reform and to do so in a financially responsible manner. Furthermore, a score that may qualify or disqualify an offender from treatment should not be viewed as permanent. Instead, scores are dynamic and increase and decrease based upon changes in any of the variables under consideration including inmate amenability, the provision/loss of treatment programs, the hiring/firing of treatment personnel, or pledges/withdrawals in the amount and/or type of family/community support being pledged.

It is important to note that A1 and A2 scores must each be divided by the total number of points possible within a particular equation. Therefore, if two variables are used (as in the A1 example appearing above), the sum would be divided by 200 (which is the maximum/total number of points possible within that equation), if three variables are used (as in the A2 example appearing above), the sum would be divided by 300 (which is the maximum/total number of points possible in that equation), and so on. Of course, the TS is always divided by 200 since it is based upon only two variables (the A1 and A2 scores).

**Conclusion**

The purpose of adopting a mathematical approach toward offender classification is to promote the use of individual/internal and group-level/external variables as indicators for the likelihood for offender reform. It is essential for officials to accurately identify variables that affect the outcome of correctional intervention as well as determine how actions and interactions combine to either facilitate or hinder treatment. These are the objectives that early attempts at prison specialization sought to achieve. While specialization failed to gain wide-spread implementation (primarily due to a lack of understanding regarding the role played by these variables), the lessons learned are quite clear – many offenders, if specifically targeted with appropriate and meaningful treatment, can achieve a rehabilitated state. By considering a wider range of variables and by increasing our understanding of their effects on therapeutic initiatives, the likelihood for offender reform improves. It is my hope that corrections officials will consider these statements and undertake a broader discourse about correctional effectiveness. The outcome of such a conversation, especially if international in scope, would be the promotion of public safety and a more responsible use of limited correctional resources.

**Acknowledgement**

I sincerely thank K. Jaishankar, Editor-in-Chief, International Journal of Criminal Justice Sciences for his insight and guidance. His leadership continues to foster communication and understanding on a global scale.

*Abbreviations and descriptions of a few A1 and A2 variables – others exist and can be substituted for, and added to, those appearing herein: OM = offender motivation (denotes an offender’s desire to change), OEC = offender expectations and commitment (denotes an offender’s expectations and commitment toward realizing his/her future plans/goals), FS = family support (denotes the types and degree of assistance that a family can provide to assist the offender), PR = prison resources (denotes the types and degree of assistance that a prison can provide to assist the inmate in developing the skills and knowledge necessary for success), CCS = community corrections support (denotes the types and degree of assistance that probation/parole officials and various support agencies can provide to assist an offender in developing the skills and knowledge necessary to achieve success).