

The Impacts of Actuarial Risk Assessment on Child Protective Services in Virginia

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Abstract

Objective: This study analyzes the impacts of actuarial risk assessment tools on child protective services outcomes in Virginia. The particular tool set, Structured Decision Making (SDM), is the most widely used set of CPS assessment tools in the United States. SDM is designed to increase the consistency of decisions across case workers and improve the validity of decisions made, thereby better protecting children from harm.

Methods: The analysis uses administrative records to compare outcomes for 30 social services departments that implemented SDM with 90 departments that did not. A quasi-experimental difference-in-difference model was used to estimate impacts. In-person interviews were also conducted with 25 case workers and supervisors in four departments, to assess SDM implementation.

Results: SDM increased the average assessed risk level for children who were victims of suspected maltreatment, decreased the proportion of children assessed to be in safe living situations, and lowered the average response priority for complaints. These impacts were large in absolute magnitude. Impact estimates for other steps in the CPS process were smaller in magnitude and not significant. Interviews with social workers found that they preferred the assessment tools to the prior, less structured approach.

Conclusions: Given increased consistency from SDM, favorable impressions of workers, and the absence of adverse impacts, states that are not using a structured CPS approach like SDM may benefit from doing so. The most important goal of actuarial assessment tools is reducing future harm to children. This analysis found no impacts on those outcomes.

Practice implications

This study found that social workers and supervisors preferred actuarial risk assessment tools to a less structured approach to the child protective services process.

Social workers felt the assessment tools improved consistency, and liked that the tools helped justify their decisions to supervisors. Supervisors liked the consistent and objective framework for making decisions about cases. The design of these particular assessment instruments led to higher levels of assessed risk in Virginia, which can be seen as a more cautious approach to reducing the risk of future harm. The analysis, however, found no evidence that the tools reduced the risk of future harm.

This article summarizes the impacts of Structured Decision Making (SDM) on child protective services (CPS) outcomes in 30 local departments of social services in Virginia. SDM is a set of actuarial (that is, empirically-based) assessment tools intended to help case workers make appropriate decisions at key stages in the child welfare process, from screening allegations to closing CPS cases. SDM is designed to increase the consistency of decisions across case workers and improve the validity of decisions made, thereby better protecting children from harm.

SDM began in Virginia in a few local departments of social services, and was expanded to 30 local agencies in December 2004. These pilot agencies volunteered to implement SDM; they were not selected randomly among Virginia's 120 local departments.

The analysis uses administrative records data to estimate impacts by comparing 30 local departments that implemented SDM with 90 local departments that did not implement SDM, using a quasi-experimental difference-in-difference approach. In addition to the quantitative analysis, researchers conducted in-person interviews with 25 case workers and supervisors in four of the pilot sites, to qualitatively assess SDM implementation and to inform the impact analysis.

Previous research and the contribution of this study

Structured Decision Making[®] is perhaps the most widely used set of CPS assessment tools in the United States. Developed by the Children's Research Center in Madison, Wisconsin, the first version of SDM was implemented in Alaska about 20 years ago, and to date has been implemented by CPS agencies in approximately 20 states, as well as in Australia.

Given its widespread use, surprisingly little research has been done to assess the impacts of SDM on children. Most research has focused on the inter-rater reliability of risk assessment tools; that is, on the degree of agreement across workers using a risk assessment instrument in decisions such as the priority for responding to an allegation of maltreatment, whether a child should be removed from their home, and the level of risk of future maltreatment. In general, this research shows fairly high levels of inter-rater reliability for SDM and other actuarial risk assessment tools, and lower levels for consensus tools. For a sample of social workers in Minnesota, Loman and Siegel (2004) found a high degree of inter-rater agreement for an SDM risk assessment instrument. The Children's Research Center conducted a study comparing SDM to two non-actuarial (consensus-based) assessment tools and found much higher inter-rater reliability for SDM: a kappa of 0.56, compared to 0.18 for each of the other assessment tools (Baird, Wagner, Healy, & Johnson, 1999). Kang and Poertner (2006) found a weak degree of inter-rater reliability (kappa = 0.29) for a consensus risk assessment tool.

Even if SDM tools produce a relatively high degree of inter-rater reliability, this does not guarantee the ultimate goal of such tools, to reduce harm to children. SDM may lead to more consistent decisions among caseworkers, but this does not ensure the decisions are better than would be reached in the absence of SDM. Despite SDM's widespread use, no rigorous independent evaluations have assessed SDM's impacts on children. An evaluation conducted by the Children's Research Center using matched comparison counties in Michigan and found that SDM reduced repeat maltreatment (Baird, Wagner, Caskey, & Neuenfeldt, 1995).

This study adds to the existing literature in a number of ways, including being the first independent evaluation of SDM's impacts on child outcomes, using a rigorous study design, and having very large sample sizes. In addition, the study assesses the impacts of SDM at each step

of the CPS process, including ultimate impacts on repeat maltreatment. Such an approach helps to determine not just whether SDM protects children, but *why*. The study includes not just a quantitative impact analysis but also qualitative evidence based on detailed in-person interviews with CPS workers.

The findings of this study have implications for the use of actuarial risk assessment tools by other CPS agencies to improve children's well-being.

Data sources

This study combines qualitative data from site visit interviews with quantitative data from Virginia's child welfare information system.

Data sources for the implementation analysis

Researchers made site visits to four local agencies in Virginia (Prince William County, Hanover County, James City County, and the city of Norfolk) between April and August 2005, conducting individual in-person interviews with a total of 25 staff. The sites were selected to be heterogeneous with respect to location, urbanicity, and size of child welfare caseloads.

Interviews were conducted with CPS case workers and supervisors.

The purpose of the interviews was to determine how local agency staff had used SDM to date, and their perceptions of SDM and its possible impacts on child welfare outcomes. Key questions in the interview protocol included:

- What did you think of the SDM training that you received?
- Which of the SDM tools have you used, and how often do you use them?
- How has SDM changed the way you work?
- Has SDM changed the likelihood of validating a referral (allegation), or response priorities for referrals?

- Has SDM had any effect on the assessed level of risk?
- Has SDM had any effect on: frequency of contacts with clients; whether a referral is founded; repeat referrals; time until a case is closed?
- What has been the most helpful aspect of SDM?

Data sources for the impact analysis

The impact analysis was performed using client-level extracts from OASIS, Virginia's child welfare information system for case workers. Data were extracted in October 2006, March 2007, and January 2008, and the files include all referrals in OASIS from the extract date back in time to 2003. (As used by the Virginia child welfare system, "referral" is synonymous with allegation or complaint.)

The analysis classifies referrals as: prior to SDM implementation, during the SDM phase-in period, or after SDM implementation. The pre-SDM period includes all referrals between September 2, 2003 and September 1, 2004. The post-SDM period includes all referrals between April 2005 and the extract date. Referrals between these two periods occurred while SDM was being phased-in in most pilot sites, and therefore may have been handled with SDM processes, pre-SDM processes, or both. To make a cleaner distinction between the pre- and post-SDM periods, the analysis excludes referrals from the in-between period. (These referrals were included, however, in constructing a base for the repeat maltreatment outcome.) The post-SDM observation period was more than 2.5 years.

Impacts were estimated for each major step in the CPS process, including: whether the initial complaint is accepted (screened in) and the response priority assigned; whether a referral was assigned to the "family assessment" track (for less serious allegations) or the "investigation" track (more serious); results of safety assessments; assessed risk level; whether cases were

opened for ongoing services; whether investigations were founded; whether a child with a valid allegation had a subsequent valid allegation; and whether a child with founded maltreatment had a subsequent instance of founded maltreatment.

For the most part, the unit of analysis was the referral. In other words, the impact results are based on counts of unique referrals, based on the referral identifier in OASIS. Sample sizes vary across the outcomes, from approximately 5,600 (for repeat maltreatment) to 82,000 observations, with a median of about 31,000 observations.

Repeat maltreatment, the key outcome for measuring child well-being, is defined as whether a child who was a victim of a substantiated maltreatment allegation during the first six months of the reporting period, had another substantiated allegation within the subsequent six month period. The unit of analysis for this measure was the child, because an investigation could have more than one child associated with a referral.

The other child well-being outcome, repeat valid referrals, indicates whether a child had more than one valid allegation during the post-SDM reporting period. The unit of analysis for this outcome was also the child.

Institutional Review Board

Although the Virginia Department of Social Services has an Institutional Review Board, this research study was considered exempt from review because the study was conducted internally by the Department of Social Services for research and management purposes and involved no additional data collection (Virginia Administrative Code 22VAC40-890-30).

Analysis approach

The results presented in this article are based on the pre-post change in each outcome in SDM localities compared to all other local departments in the state. This approach is a

“difference-in-difference” analysis, because it involves both the difference pre- to post-SDM and the difference between SDM and non-SDM sites. Specifically, the impacts of SDM are calculated using the following equation:

$$impact = (Y_{post}^{SDM} - Y_{pre}^{SDM}) - (Y_{post}^{NonSDM} - Y_{pre}^{NonSDM})$$

where:

“Y” is the outcome of interest (e.g., the proportion of referrals that were screened out), the superscripts denote SDM and NonSDM sites, and the subscripts denote pre- versus post-SDM measures of the outcome.

For example, if the outcome of interest is the proportion of referrals designated as Family Assessments (rather than investigations), and the proportion for SDM sites is 71 percent after SDM and 80 percent before SDM, and the corresponding proportions for non-SDM sites are 64 percent after SDM and 75 percent prior to SDM, then the impact estimate for this outcome is [(71 – 80) – (64 – 75)], or 2 percent.

The difference-in-difference approach is intended to control for any pre-existing differences between SDM and non-SDM sites. For example, the numbers in the preceding paragraph show that SDM sites were more likely than non-SDM sites to assign referrals to the Family Assessment track *prior to SDM implementation* (80 percent versus 75 percent). Whatever the reason for this pre-existing difference, the analysis adjusts for the disparity so it is not falsely attributed as an impact of SDM. Although this approach is likely to produce more accurate impact estimates than the simple post-SDM difference between SDM and non-SDM sites, there is no guarantee that it controls for all differences between SDM and non-SDM sites. For an impact analysis, the preferred approach would have been to randomly assign sites to implement SDM. Because local agencies volunteered to implement SDM and were not

randomly assigned, a quasi-experimental difference-in-difference design was selected as the next best alternative.

The statistical significance of the impact estimates is determined using a fixed-effects linear regression specification for the difference-in-difference model. The model fits the outcome variable (e.g., whether a referral was screened out) against variables indicating whether the outcome happened before or after SDM implementation, the interaction of that variable and a variable indicating whether the site had implemented SDM, and indicators for each site (the fixed effects):

$$Y_{ij} = b_0 + b_1 Post_i + b_2 SDM_j * Post_i + b_3 Site + u_{ij}$$

where:

Y_{ij} is the outcome of interest (e.g., whether referral i in site j was screened out);

$Post_i$ is a 0/1 indicator, where 1 means observation i happened after the SDM implementation period and 0 means before the SDM implementation period;

SDM_j is a 0/1 indicator, where 1 means observation j is from an SDM site and 0 means a non-SDM site;

$SDM_j * Post_i$ is the interaction of SDM_j and $Post_i$;

$Site$ is a vector of site dummies (one indicator for each site); and

u_{ij} = the error term.

The coefficient b_2 is the estimate of SDM's impact on the relevant outcome, and the standard error on b_2 is used to determine statistical significance. A robust cluster variance estimator was used to compute standard errors, to account for the site-level clustering of observations.

Findings from site visit interviews

Interviews conducted during visits to four pilot agencies in April through August 2005 showed that most staff thought that SDM might increase the *consistency* of decisions across case workers but would not substantially change the *level* of key outcomes. Researchers asked local agency staff whether they thought SDM would affect a number of specific outcomes, including: the likelihood of screening out a referral; response priority; the differential response decision; the likelihood that an investigation would be founded; the likelihood of repeat referrals; time to disposition; the likelihood of reunification; and the time to reach a permanency goal. Although a few staff said that SDM might affect one or more of these outcomes, most staff said SDM would not affect these outcomes and had not substantially changed the way they work. Many staff, however, mentioned that SDM might increase consistency of decision making across workers. The most frequently mentioned exception was for risk assessment. Staff felt that the SDM risk assessment tool sometimes produced a higher risk level than a case warranted. Loman and Siegel (2004) noted similar findings among social workers in Minnesota using an SDM risk assessment instrument.

Overall, the vast majority of local agency staff interviewed were positive about SDM and said they want to continue using SDM. Both workers and supervisors noted that the SDM instruments helped workers justify their decisions to supervisors, and supervisors liked the consistent and objective framework for making decisions about cases. Several staff said that knowing that SDM tools are based on research findings made them more comfortable using the tools.

Site visit interviews also suggested that, unlike for CPS, SDM tools were not yet being used extensively for foster care, in part because of confusion about the foster care cases to which SDM applied.

Findings from the site visit interviews, although informative, are based on the subjective impressions of staff. The impact analysis complements the qualitative findings from site visits and provides a more quantitative perspective on SDM's impacts on child protective services in Virginia.

Expected impacts of SDM

Based on staff interviews during the site visits, the SDM was expected to increase the consistency of decisions across workers, and increase the assessed risk level for the initial risk assessment. The data available allow estimating impacts on risk levels, but not impacts on consistency across workers. Given workers' slow start in using SDM for foster care, there was no expectation of substantial impacts on foster care outcomes, and impacts were not estimated for foster care outcomes.

In addition to the information from site visits, the SDM instruments themselves suggest possible impacts. Specifically, the SDM instruments provide scoring rules to help workers decide: response priority, assessed safety level, initial risk level, and risk level for a reassessment. The SDM scoring process could lead to differences in these outcomes compared to non-SDM sites. Although non-SDM sites also used safety and risk assessment processes, compared to SDM these processes were less structured and more variable across local agencies.

In addition to the intermediate outcomes above where SDM might be most likely to have effects, the analysis examined other intermediate outcomes where there is less reason to expect an impact of SDM. Finding no differences in these other outcomes provides more confidence in

the analysis approach. On the other hand, an impact on one step in the CPS process could affect later intermediate outcomes, even if there is no SDM tool for those outcomes. For example, if workers using the SDM intake tool screened out certain types of referrals that previously had been classified as investigations, the proportion of investigations that are founded could be different for SDM sites.

Findings from the impact analysis

The analysis suggests that SDM's largest impacts on Virginia's CPS processes have been to: increase the assigned level of risk for family assessments and investigations; decrease the initial response priority for accepted referrals; and increase the proportion of referrals in which safety factors were identified. These findings are consistent with expectations, because there are SDM scoring rules for each of these intermediate outcomes, and because the case workers interviewed emphasized the increase in assigned risk level. Also consistent with expectations, SDM had smaller or no significant impacts on other intermediate outcomes. For the child well-being outcomes examined, the estimated impacts of SDM were not statistically significant, and in conflicting directions. The impact estimate on the proportion of children who experienced repeat valid referrals was favorable (showing a decline), and the impact estimate on the rate of repeat (founded) maltreatment was unfavorable (showing an increase), although both estimates were small in absolute magnitude and neither was statistically significant.

Table 1 shows SDM's estimated impacts—the difference in mean outcomes between SDM and non-SDM sites—for the major steps in the CPS process. The outcomes in Table 1 are listed roughly in the order in which they would occur for a CPS case, and by whether the outcomes are for a family assessment or an investigation. Table 1 uses asterisks to denote statistically significant impact estimates.

- **SDM increased the assigned level of risk for family assessments and investigations.**

Compared to non-SDM sites, SDM sites were much more likely to assign referrals to the high risk category, and much less likely to classify referrals as low risk, for both family assessments and investigations. Twenty-eight percent of family assessment referrals were classified as high risk in SDM sites, compared to only seven percent in non-SDM sites (Table 1, sixth outcome). Similarly, close to half (43 percent) of investigations were classified as high risk in SDM sites, compared to only about one-fourth (29 percent) in non-SDM sites (Table 1, seventh outcome).

The increase in assessed risk was predicted by CPS workers in the site visit interviews, who pointed to the design of the SDM risk assessment instrument. Workers noted that the risk assessment tool scores all neglect complaints as at least moderate risk, even if there are no other presenting problems in the family. Other factors, such as four or more children in the home and a youngest child under two, automatically increase the risk score. Workers said that the SDM-assigned risk level was higher than warranted for some cases, based on their knowledge of the specifics of those cases. (The SDM initial risk assessment tool allows supervisors to discretionarily *increase* the scored risk level, but not to decrease it.) The scoring in the SDM risk assessment instrument is based in part on research linking neglect *allegations* to future harm.

A possible implication of higher assigned risk scores is an increased workload for workers. VDSS contact standards require more frequent contacts with clients for higher assigned risk levels. On the other hand, if a worker and supervisor feel that SDM assigns a higher risk level than is warranted in a particular situation, they may take this into account in deciding on the frequency of contacts. That is, in addition to the contact standards, workers

may use their knowledge of specific cases and their experience to decide how to allocate their limited time, given high caseloads.

- **SDM decreased the proportion of referrals that were assigned a moderate response priority, and correspondingly increased the proportions of referrals assigned to low and high response priorities.**

SDM increased the differentiation in response priority for referrals, decreasing the medium priority and increasing the number of high and low priority referrals. Fourteen percent of accepted referrals were classified as moderate priority in SDM sites, compared to 22 percent of accepted referrals in non-SDM sites, a difference of 7 percentage points (Table 1, second outcome). Correspondingly, SDM sites were about four percentage points more likely to classify referrals as low risk and four percentage points more likely to classify referrals as high-risk. SDM standards suggest that workers respond within five days for low-priority referrals, within 48 hours for moderate priority, and within 24 hours for high priority referrals.

One interpretation of the greater differentiation in response priorities is that the SDM intake screening tool gives intake workers a clearer and more defensible rationale for assigning a low or high priority to certain referrals, reducing the reliance on subjective judgments in the face of uncertainty.

- **SDM decreased the proportion of referrals initially identified as “Safe” and increased the proportion classified as “Conditionally Safe.”**

A smaller proportion of accepted referrals were classified as “Safe” in SDM sites compared to non-SDM sites. Correspondingly, a higher proportion of accepted referrals were classified as “Conditionally Safe” in SDM sites. This result holds for both family

assessments and investigations, and the impacts were in the range of 5 to 12 percentage points (Table 1, fourth and fifth outcomes).

This result likely reflects the fact that the SDM Safety Assessment tool lists fourteen major safety factors and 72 subfactors for the worker to identify during the Family Assessment or Investigation. A worker may indicate “Safe” only if no safety factors were identified during the assessment. According to VDSS policy, case workers are required to develop safety plans for children deemed “Conditionally Safe” or “Unsafe.”

- **SDM had no clear impacts on future harm to children.**

Although children at SDM sites were slightly less likely to have a second maltreatment complaint, 10 percent versus 12 percent over the full follow-up period, the decrease was not statistically significant (Table 1, next-to-last outcome).

In terms of the repeat maltreatment outcome, SDM sites had slightly *higher* rates of repeat maltreatment, but again the difference was not statistically significant. Over the available follow-up period, 3.7 percent of children in founded investigations (that is, substantiated maltreatment) in SDM sites had a second founded investigation, compared to 2.5 percent in non-SDM sites (Table 1, final outcome).

Given the opposing direction of these impact estimates and the lack of statistical significance, the data do not provide clear evidence that SDM reduces the risk of future harm to children.

Given the low frequency of these outcomes, it is possible that statistically significant impacts would emerge over a longer follow-up period.

- **SDM had small or no evident impacts on other steps in the CPS case management process, such as the screening and tracking of referrals, final dispositions for investigations, or service plan recommendations.**

SDM had no impact on the proportion of referrals assigned to the family assessment track, rather than the more serious investigation track (Table 1, third outcome).

SDM sites were somewhat more likely than non-SDM sites to recommend services in family assessments (43 percent versus 36 percent, eighth outcome in Table 1).

Impact estimates were not statistically significant for the other steps in the CPS process, including: the proportion of referrals that workers screen out (3 percentage points higher for SDM sites), whether cases were opened for ongoing services (3 percentage points higher for SDM sites), whether family assessments were changed to investigations (about 2 percent for both SDM and non-SDM sites); whether an investigation was founded (2 percentage points lower for SDM sites); or the level of harm for founded investigations. Table 1 shows all of these results. Because the SDM instruments do not explicitly include most of these decision points, the absence of clear impacts on these outcomes is not unexpected.

Discussion

SDM had large impacts on certain aspects of Virginia's CPS process. Specifically, SDM increased the average assessed risk level for children who were the victims of suspected maltreatment, decreased the proportion of children assessed to be in safe living situations, and lowered the average response priority for complaints. All of these impacts were large in absolute magnitude. Impact estimates for all other steps in the CPS process were smaller in magnitude and not statistically significant.

A key issue is the real world implications of these impacts, both for case workers and for children in the CPS system. For workers, the evidence suggests offsetting effects: increased workload due to higher assessed risk and lower assessed safety, but lower workload due to more complaints being screened out and lower response priority. The fact that most workers interviewed during site visits wanted to continue using SDM suggests that any net increase in workload may be outweighed by the perceived benefits of SDM. A study is currently underway to compare workload in SDM and non-SDM sites. In the meantime, additional local agencies in Virginia have volunteered to implement SDM, and nearly all the sites that have already implemented SDM continue to use it.

Evidence from earlier research (discussed above) shows that actuarial assessment tools can improve consistency across workers, as measured by inter-rater reliability. Given this benefit, the favorable impressions of workers using SDM, and the lack of adverse impacts, states that are not using a structured CPS approach like SDM may benefit from doing so.

The most important goal of actuarial assessment tools such as SDM is reducing future harm to children. Unlike the Michigan study mentioned above, the current analysis found no impacts on protecting children from future harm. Under what circumstance actuarial tools can reduce future harm to children is an open question, and a very important question for research.

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Table 1
Summary of SDM's Impact on Selected Outcomes

Outcome	SDM Site Mean	Non-SDM Site Mean¹	Impact of SDM (Difference in Means)
Screened Out Referrals	40.9%	38.2%	2.7%
Response Priority for Accepted Referrals			
R1: High	34.2%	30.5%	3.7%
R2: Moderate	14.3%	21.6%	-7.3% **
R3: Low	51.5%	47.9%	3.6%
Differential Response Decision			
Family Assessments	72.4%	71.0%	1.4%
Investigations	27.6%	29.0%	-1.4%
Initial Safety Assessment Findings: Family Assessments			
Safe	56.0%	67.3%	-11.3% ***
Conditionally Safe	43.0%	30.8%	12.2% ***
Unsafe	1.0%	1.8%	-0.8% ***
Initial Safety Assessment Findings: Investigations			
Safe	41.0%	45.7%	-4.7%
Conditionally Safe	47.7%	40.6%	7.1% **
Unsafe	11.3%	13.8%	-2.5%
Risk Assessment: Family Assessment			
High Risk	27.7%	7.4%	20.3% ***
Moderate Risk	47.7%	26.9%	20.8% ***
Low Risk	24.6%	65.6%	-41.0% ***
Risk Assessment: Investigations			
High Risk	42.6%	29.1%	13.5% ***
Moderate Risk	29.6%	30.7%	-1.1%
Low Risk	27.9%	40.4%	-12.5% ***
Service Plans: Services Needed (Family Assessments)	42.9%	36.1%	6.8% ***
Cases Opened For Ongoing Services	15.0%	11.6%	3.4%
Family Assessments Changed to Investigations	2.3%	2.4%	-0.1%
Investigation Findings: Founded	47.0%	48.7%	-1.7%
Dispositional Assessment for Founded Investigations			
Level 1: Serious Harm	33.4%	34.4%	-1.0%
Level 2: Moderate Harm	30.0%	27.6%	2.4%
Level 3: Minimal Harm	36.6%	38.0%	-1.4%
Repeat Valid Referrals			
Within 6 Months	5.1%	6.6%	-1.5%
Within 12 Months	7.7%	9.4%	-1.7%
More than 12 Months	10.1%	11.8%	-1.7%
Repeat Maltreatment			
Within 6 Months	1.2%	0.1%	1.1%
Within 12 Months	2.2%	1.3%	0.9%
More than 12 Months	3.7%	2.5%	1.2%

***Significant at the p<0.01 level; **Significant at the p<0.05 level; *Significant at the p<0.1 level.

Source: Office of Research analyses of OASIS data extracts.

¹The non -SDM site mean is adjusted to make it comparable to the SDM site mean by accounting for pre-existing differences between SDM and non-SDM sites. The formula for the adjusted non-SDM site mean is: $Y_{post-adjusted}^{NonSDM} = Y_{pre}^{SDM} + (Y_{post}^{NonSDM} - Y_{pre}^{NonSDM})$

This equation simply rearranges the terms in the impact equation in the text.