

Distributive Decisions in Education:

Goals, Trade-Offs and Feasibility Constraints

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Abstract

Educators, policymakers and citizens face questions of how to allocate scarce resources in the pursuit of competing goals for children and youth. Our goal in this paper is to provide decision makers with a framework for considering allocative problems in education, explicitly highlighting the implications of relevant feasibility constraints. We assume that the decision maker cares about children's present and future welfare and that she gives priority to children whose welfare is lower. We highlight four especially relevant constraints: scarcity of resources, buy-in from community members, high-stakes consequences of skill development, and measurement of desired outcomes. Using four cases to illustrate common situations decision makers face, we show that the framework provides both some understanding of the distributive decisions that are made in practice and some structure for thinking about how to optimize decisions in non-ideal settings.

Keywords

Education, Equality, Feasibility Constraints, Optimization, Flourishing, Welfare, Non-Ideal Theory

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## Introduction

Teachers, school leaders and policymakers face questions of how to allocate scarce resources in the pursuit of competing goals for children and youth. A teacher may want all of her students to learn as much as possible, but might sacrifice some learning of her most advanced students in order to help her lowest achieving students catch up, at least partially. A legislator or lawyer may wish to pass legislation that provides more resources to students living in poverty, knowing that this reallocation could result in fewer resources for other students, even though she values resources for these other students as well. Trade-offs like these result from scarcity and other feasibility constraints that, at times, go unrecognized. Our goal in this paper is to provide educators, policymakers and citizens with a framework for considering allocative problems in education, explicitly highlighting the implications of relevant feasibility constraints.

A key element of our framework is the set of goals, both distal and proximal, that reflect values decision makers hold for students. Distal goals are the ultimate aims for students (e.g., good job opportunities), while proximal goals are the outcomes that can be measured immediately in order to inform current decisions and are those on which schools have the most influence (e.g., achievement on standardized tests). Some proximal goals are chosen because they are predictors of distal goals, which cannot be measured in the short run, and some are chosen because they are of immediate importance. In addition to specifying these goals, policy makers must identify the feasibility constraints affecting schools' capacities to realize those goals. The imprecision of measuring the goals for students is one feasibility constraint, but it is not the only one that education decision makers commonly face.

In what follows, we describe a set of goals that an educational policy maker could hope to realize through schooling. We then identify four feasibility constraints that affect decision makers' choices that ultimately may limit how successfully they can accomplish those goals. We refer to this combination of goals and constraints as a "framework."

In order to demonstrate the usefulness of this framework, we present four stylized cases that highlight the kinds of allocative problems policymakers face. These cases are intended to highlight common, yet difficult, allocative decisions. Teachers and school leaders face similar problems and could utilize a similar framework in classrooms, but for clarity we focus at the policy level.

Here, now, are the cases:

*Case 1: Two children come from families with very different socioeconomic characteristics, one very wealthy and the other very poor. Because of their backgrounds, the two children have very different measured abilities, one who performs very well and the other who*

*struggles. How much compensation is owed, if any, to the child who comes from the disadvantaged household?*

*Case 2: Two children come from background conditions described above. In this case, however, the two children perform equally well on available measures of abilities. Does the child from the disadvantaged household have claim to additional resources, and if so, why? Should this child receive less than the disadvantaged child from Case 1?*

*Case 3: Three different children from three different families are entirely alike with respect to social circumstance. Despite these similarities, the children demonstrate differences in measured abilities. On a traditional standardized test, the first and second children score in the 5<sup>th</sup> percentile nationally, while the third child scores at the 50<sup>th</sup>. Between the first and second children, one is much more expensive to teach than the other. The third child who scores at the 50<sup>th</sup> percentile costs somewhere in the middle. How should these differences in costs of learning and levels of attainment affect the allocation of resources?*

*Case 4: Finally, consider two children from two different families that are alike in their access to resources. The parents of these children have different rearing practices, in which the first family is more hands-off (without being negligent) and allows the child to develop her interests and skills at her own pace. The second family is hands-on (while still being nurturing) and allocates the child's time into coordinated learning activities. The effect of these rearing practices is that the second child has greater measured abilities than the first child. Does the fact that one child has lower measured outcomes than the other warrant additional educational resources?*

In the next section, we describe a stylized, but generally realistic, world in which a policymaker makes decisions. This approximation simplifies the optimization problem we describe and limits us to the ways in which schooling can be used to accomplish desired outcomes under non-ideal (realistic) conditions. With these background conditions in place, we present distal and proximal (ultimate and intermediate) outcomes a policymaker is likely to aim for, as well as four real-world feasibility constraints that confound the realization of those aims. We conclude the essay with an analysis of the cases above. The framework we provide allows us to break the cases into smaller parts, including outcomes of interest, measurement, constraints and trade-offs, which are necessary conditions for identifying an “all things considered” optimal policy choice for realizing the chosen outcomes.

The purpose of this paper is “descriptive” as opposed to “prescriptive,” meaning that the outcomes of interest we identify reflect generally agreed upon values and commitments. The other elements we describe include measurement problems, resource and political constraints and the trade-offs that ensue. These other elements reflect empirical realities. As we make clear later, there will be many decisions that need to be made about, for

example, how much weight to give to improving overall welfare versus improving the welfare of the least advantaged students. We take no position here on how policy makers should weight different desiderata, and it is for this reason that we say the paper is not, or is only minimally, prescriptive.

### The Position of the Policymaker and Background Assumptions

Imagine an educational policy maker, whom we will refer to as Anna, who has considerable authority over the state's educational system. Anna's primary means of shaping the educational experiences of children is through the distribution of resources, indicated by per pupil expenditures. Expenditures represent an all-purpose commodity, and can be converted into the purchase of teachers, curricular materials, evaluation systems, etc.

Anna has, more or less, complete discretionary power over spending on schools, unless noted otherwise. The state collects a given amount of funds from tax revenues, and Anna can allocate those resources to whomever she likes. The money collected is for use in purchasing goods for direct use by schools. If that money is not spent, it will be lost. This assumption means that Anna will not be required to consider whether resources could be better spent in non-school settings, such as healthcare or welfare, even if those services affect educational outcomes. She is restricted to making expenditure decisions pertaining to schools. While few policymakers have complete discretion over spending, many do consider what decisions they would make given complete discretion and use this understanding within a political process.

Anna knows the schooling system and the broader community well; however, her knowledge about the effects of resources, the needs of students and the responses of individuals to policy choices is imperfect. Anna must make her best guess at the effects of policies even though her information is incomplete.

Anna also has very little influence outside of schools. She assumes that societal conditions are, at least in the near term, more or less fixed. She knows that as a result of these conditions, a child's education is likely to substantially affect her life prospects.

The description of Anna that we provide is stylized but conforms to some of the more relevant realities we wish to consider. We give her discretionary power over spending because it allows us to simplify the process through which policymakers secure funds for different students. The other background characteristics are more fundamental to the decision-making process and are therefore included. Here, then, we have the position of the policymaker and some background assumptions. We now turn to the kinds of outcomes a policymaker in this situation would like to produce.

### Desired Outcomes

Here, we describe Anna's goals. These goals reflect basic normative commitments to children's present and future welfare, combined with a preference for improving the welfare of the least advantaged. Welfare (which for us is synonymous with flourishing and well-being) is a complicated and contested notion, and we are not endorsing a singular conception. In broad terms, we conceive of welfare as how richly individuals can lead the life that they want. This conception of welfare has both subjective and objective elements. It is subjective in the sense that individuals have different purposes for themselves and will get satisfaction from pursuing different aims. Not everyone's welfare will hinge on whether they have the capability to dance well or perform complex mathematics. Welfare is also, at least in part, objective in the sense that there are aspects of life that have universal appeal: autonomy, strong personal relationships, opportunities to realize one's goals, security, nourishment, etc. We use this general notion of welfare throughout the paper, and aim for it to be broad enough to warrant support.

Having defined welfare, we can now say that Anna cares both about the level and distribution of it. The level of welfare simply means that more welfare – or richer lives - is better than less welfare. The distribution of welfare matters as well. Anna believes that welfare gains at the bottom of the distribution are more important than welfare gains at the top of the distribution. The possibility that some students will have very low welfare is especially troubling. She will try to ensure that the chances of that happening are low. Certainly, for example, if she has a choice between spending resources to improve the welfare for a student at the low end of the distribution or a student at the high end, and if these welfare gains are equivalent, she will spend that money on the student whose prospects are lower, all else equal. This choice has the effect of reducing inequality but is motivated out of a concern for the least advantaged.

Because Anna values gains at the lower end of the distribution more, she may be willing to spend resources to improve the welfare for a student at the low end of the distribution even if that student would gain *less* than a student at the high end of the distribution. This choice has the effect of reducing inequality while also reducing average welfare, relative to the alternative of spending resources on the higher-end student. The decision about how much to value or weight gains at the bottom of the distribution relative to the top reflects the kinds of trade-offs Anna must make. She balances an interest in improving welfare for the worst off with an interest in greater welfare, and is willing to tradeoff gains at the bottom for average welfare and vice-versa. We do not suggest that there is a universally appropriate weight that should be given to increasing welfare on the bottom versus increasing average welfare, only that she considers these tradeoffs in her decisions.

Having committed to the two goals of flourishing for all and weighting gains at the bottom more, we can now think more carefully about goals for education and for schools, in particular. Anna's sphere of influence is limited to the distribution of resources for schools.

Because welfare is a function of various components, Anna will focus most on those components that schools are designed or able to produce. A prominent idea is that schools produce skills that are useful for earnings in the labor market, but schooling's sphere of influence extends beyond skills necessary for earnings. Schools also shape children's attitudes about and abilities for multiple purposes, including, among others, interpersonal relationships, art appreciation, civic participation, sexual health, and physical fitness. These varied qualities do not necessarily translate directly to labor market success but are nevertheless important aspects of welfare, and schools can and should affect them.

It is worth emphasizing here the temporal aspect of the allocation decision. While Anna may be concerned with an individual's welfare throughout the lifespan, her ability to influence welfare begins only when the individual enters school and then persists after the individual exits the school system. What distinguishes her ability to influence individuals during school from her ability to influence them after they have completed school is that her influence during school is direct, while her influence after is probabilistic. She directly influences the experiences that students have in school, but she only affects their *likelihood* of adult outcomes, such as health and labor market success. Because of the uncertainty of her influence on later outcomes, we describe "prospects for welfare" when we discuss the attributes the child gains while in school that are predictive of future welfare. Current welfare, which is how well the child is doing as a child, is also a relevant aspect of welfare. Certainly, there are instances in which sacrifices must be made for improving one's prospects for future welfare, but these benefits and sacrifices should not always take precedent over current welfare. How much weight should be given to current versus future welfare represents an additional trade-off that Anna must consider, and once again, we do not specify what these weights should be.

Anna wishes to improve the prospects of flourishing for all students through schooling, without sacrificing childhood happiness and satisfaction. In order to better understand students' prospects for welfare, Anna has schools collect information on students' skills, knowledge and motivations. Her goal is for these measures to be good predictors of students' likelihood of flourishing in the future. They, for example, could include math skills, artistic ability, and the capacity to motivate others, among other features. We refer to these measures as "achievement," though they are clearly much broader than achievement measures typically collected by schools today. However, like current measures typically collected, Anna's measures are also inherently incomplete, capturing some but not all of the student qualities that can contribute to their future welfare.

How should this broad type of achievement be distributed across students? Even if the ultimate aim of schooling is to provide all individuals with the best chance for flourishing lives, not all students will need the same bundle of abilities to get to the same level of flourishing. This difference between the distribution of prospects for flourishing and the

distribution of abilities can occur for two reasons. First, equivalent amounts of well-being can be had from different combinations of abilities. Two students can be equally well off even though one student has developed great skills in music but few in painting, while the other has great skill in painting but few in music. Some basic level of many abilities is likely necessary for all kids—an ability to relate to others, to appreciate art, numeracy and literacy—to ensure reasonable life prospects, but not every child will require the same exact bundle. It may even be that excelling in a particular area gives greater welfare than equal distribution of abilities across a range of areas.

The second reason that the distribution of prospects for welfare and the distribution of abilities are not synonymous is because the relationship between abilities and welfare can differ across individuals. Suppose two individuals have equal bundles of skills and aptitudes, but they have different native capacities (or potentials). Given that using one's potential (which includes the process of developing one's abilities) is important for one's welfare, the higher-capacity individual will be worse off, even though they have equal bundles. She is worse off because she has developed less of her natural abilities than the other individual and because she has had fewer opportunities to enjoy the benefits of developing those abilities.

We do not say how much of one's welfare is comprised of the development of native potential, only that such development is one aspect of welfare. Take a slight modification to the example just used: one individual has slightly higher achievement than another, but this person with the slightly higher achievement has much more native potential. With respect to the development of potentials, the child with slightly higher achievement is worse off because she has developed much less of her native potential than the other. In the aggregate, however, the child with the slightly lower achievement may be worse off if the level of achievement matters more for overall welfare.

The account of potentials that we describe might appear to be flawed because it favors children born with greater natural endowments. However, it should be clear we are not arguing that a person is entitled to more welfare on account of having greater potential. Instead, we think that developing one's potential contributes to one's welfare. Considering this aspect of welfare can result in unequal developed bundles of achievement, but the underlying goal is to secure high levels of welfare for all persons. Ultimately, it is welfare that Anna cares about, and she will use overall achievement and, at least to some extent, the development of potential as indicators of welfare.

Up to this point, we have posited two goals about which our policymaker is concerned: ensuring a high level of welfare for everyone and assigning more weight to improvements at the bottom. Because achievement, capaciously understood, matters so much for welfare and because schools are uniquely situated to produce achievement, Anna will try to

influence the level and distribution of achievement with her decisions about resource allocation. Different children will end up with different bundles of achievement and resources, and some children will even end up with different levels of measured achievement in the aggregate as a result of children differing in their natural capacities. Finally, the child's welfare during childhood cannot be jettisoned in order to increase her welfare prospects as a future adult; both must be considered. We have here, then, the distal goals of increasing welfare for everyone while privileging welfare gains for the least advantaged and the proximal goal of cultivating achievement, broadly defined, for welfare.

#### Feasibility Constraints: Measurement, Scarcity, Stakes and Buy-In

We have thus far introduced the conceptual landscape in which our policymaker operates. In this section, we describe real-world constraints she is likely to encounter as she pursues these goals. Specifically, we emphasize four constraints: scarcity of resources, buy-in from community members, high-stakes consequences, and measurement. These real-world aspects operate as feasibility constraints that influence Anna's ability to fully realize her goals.

##### *Scarcity*

Because Anna cares about both the level of welfare and its distribution, she will have to make decisions about how much achievement-for-welfare she is willing to trade-off in the aggregate so the distribution can be better for those whose prospects are lowest. The need for this tradeoff occurs because of the problem of scarcity. If Anna were indifferent to the *distribution* of welfare (that is, improving welfare for those at the bottom), she would simply allocate resources as efficiently as possible. Those students who stood to gain the most for a given amount of resources would receive those resources. Other feasibility constraints might still affect her ability to distribute resources efficiently, but she would not have to worry about trading-off distributional concerns. Because distribution does enter into her decision-making, she will have to balance concerns about level and distribution.

Distributional concerns become particularly salient when a child has very low-levels of achievement such that his prospects for flourishing are severely reduced. If this child is also very costly to teach, then other students will have lower prospects for flourishing so this one child can have better chances. Situations like these are not easily sorted, but Anna must be mindful of both factors when she decides how to allocate resources for schools.

##### *Community Buy-In (or the democratic process)*

Anna's preferences for compensating those whose achievement is lower (and therefore have lower prospects for welfare) will be affected by the need for community buy-in.



Revenues for education come from taxes. If revenues are distributed entirely to one group (or to one individual), non-receiving groups (or persons) may choose to tax themselves at a lower rate or vote to replace Anna with an alternative decision maker. Her budget constraint therefore will be sensitive to the distributive decisions she makes, as these distributive decisions will influence families' willingness to pay, keep their children in the public school system, and keep Anna in her position. While she must make distributive decisions under general conditions of scarcity, community buy-in places an additional resource constraint on how much she can allocate to particular persons or groups.

Anna must estimate the amount of resources that she will have to distribute with uncertainty, as she does not have full information about how much families will tolerate redistribution. This toleration constraint also will vary over time as populations and values change. Insofar as Anna cares about providing compensation to students across time, this budget constraint will be ever on her mind.

### *The High-Stakes of Achievement*

Scarcity becomes especially salient when we consider how important achievement is for welfare. As we have structured the problem, Anna has quite a bit of discretion about how to distribute resources between schools, but she has very little influence outside of schools. We assume that background conditions are, at least in the near term, more or less fixed. A child's education is likely to alter her life prospects substantially, because education affects earnings and the availability of opportunities for diverse and meaningful work, as well as mental and physical health.

The high-stakes nature of the welfare returns to achievement will influence how much Anna regards trade-offs between levels and distributional concerns. When an individual's welfare prospects are especially bleak, she may pursue less efficient (more costly) educational interventions if those interventions can improve the prospects of the least advantaged person. Different background conditions – supposing, say, that a generous welfare state guaranteed a minimum income for all persons irrespective of their skills and aptitudes – could change the relationship between achievement and welfare, which in turn could change Anna's decisions. She might favor the development of different bundles of achievement, or she might change her distributive preferences. She might shift her concern away from improving the achievement of the lowest person to something closer to increasing average achievement as much as possible, if background conditions were different.

### *Measurement*

The last feasibility constraint we call attention to is the problem of measurement. Anna's broad measure of achievement is her best guess as to a child's prospects for future welfare.

While differences in children's achievement may be due to cognitive impairments or social background conditions, taken alone, neither of these sources of difference are worthy obstacles for compensation. They are all equally morally arbitrary, as children are neither responsible for their family's social class nor their own cognitive ability. What matters is that achievement is important for flourishing, and achievement has two dimensions: how much achievement one has predicts how much flourishing one is likely to experience, and developing one's potential is important for one's flourishing.

The measurement of achievement presents some conceptual challenges. The first challenge is that we do not know the precise link connecting a particular bundle of skills (academic, physical, artistic, civic, and interpersonal) to an individual's welfare. This link is unknown, first, because individuals may gain different benefits from a particular set of achievements. However, even leaving these subjective (or individual) differences aside, we do not know what welfare individuals, on average, gain from a particular set of achievements.

As an approximation of the welfare benefits derived from skills, we can link measures of prior achievement to current income, which is one contributor to long-run welfare. Income may be a more concrete measure than welfare, but linking achievement to income is not a panacea. The observed relationship between measured achievement and income is still an average relationship, meaning that individuals will have different income experiences from the same level of measured achievement. Moreover, income fails to capture the non-pecuniary benefits of achievement that are also important for welfare, such as job choice, art appreciation and literacy. Broader analyses that link achievement measures to a fuller set of outcomes, such as health and family stability, provide additional relevant information and are more satisfying approximations of the average link between achievement and welfare. These additional outcomes are still descriptions of averages, but with a rich enough set of outcomes we would have a fuller account of the objective welfare benefits of achievement.

A related, but distinct, problem for measuring achievement is that even a broad conception of achievement that aligns well with the qualities that contribute to welfare is probabilistic and does not guarantee well-being. Achievement affects students' prospects (or probabilities) for welfare. This lack of surety implies that students may have a high expected welfare given their abilities, but they can also have some probability of very low welfare. Suppose, for example, that a student has unusually good ability in the arts, but few skills in literacy or numeracy. Perhaps this student's expected welfare is equivalent to most other students, as she is very skilled as an artist and, if she does have success, her welfare will be very high; yet, because her bundle of skills is not well distributed, she also has considerable risk of very low welfare. She could reduce this risk by improving her literacy and numeracy skills, even though development of these attributes takes time away from her art and are unrelated to the welfare gains she gets from pursuing her art. In this way,

some elements of achievement can act as insurance for future welfare, as they are more likely to produce welfare, albeit at a lower rate. An aversion to low welfare will lead Anna to focus on achievement elements that protect against very low welfare.

In order for these measures to capture the subjective (or individual) elements of welfare, we need to assume that health, family and income are equally important for all persons. If we are willing to make that assumption, the objective and subjective elements of welfare converge. If we are not willing to make that assumption, linking achievement to individual welfare is more difficult. Giving students the opportunity to choose their own classes, and giving them multiple opportunities to enter and exit school can help match achievement to individual needs, but determining who is worse off in terms of prospects for subjective welfare is a difficult task. Ideally, Anna would be able to provide individuated packages of achievement-states for all students, tied directly to future welfare, but such information is largely unavailable.

Anna also faces challenges in measuring a child's potential, the second dimension of achievement taken to be relevant for welfare. This measurement would be useful to her as she attempts to assess whether a child has had the opportunities to develop that potential. We have claimed that potential matters objectively for welfare, but because children's natural potentials are fundamentally unobserved, the measurement problem is closer to that of subjective welfare. She observes achievement levels but not, for example, the opportunities to develop them at home. If she sees two children with different achievement levels but doesn't observe their opportunities outside of school, she will not know whether the differences come from differences in opportunities or in natural potential. As a result, Anna may seek to observe opportunities, but such observation is expensive at a large scale, or she may seek proxies for such opportunity such as parents' financial resources, which is far less accurate but far lower cost.

When individuated packages of achievement are unavailable and when a child's potential is unknown, a useful proxy for Anna will be to make between-group comparisons (such as those indicated by race, gender and/or social class). A between-group comparison simply compares the distributions of achievement (again, broadly understood) between two groups. If the comparison is between groups that Anna believes have approximately the same distribution of potential, high- (or low-) achieving members of one group should have the same level and combination of skills as the high- (or low-) achieving members of another group. When Anna believes that the respective distributions of potential are the same, differences between groups, on average, provide evidence that achievement-based opportunities for welfare from the development of potential are not equally distributed.

Using comparisons across groups as indicators of unequal prospects for welfare depends upon broad and accurate measures of achievement. If groups have different life goals and

therefore differ in their preferences for bundles of achievement, and if the measure of achievement favors one type of achievement more than another, then differences in mean measured achievement may not reflect true differences in prospects for flourishing. Imagine that one group cares only about singing and is very good at it, while another group cares only about dancing and is also very good at that. If our measure of achievement favors dancing, then it will appear as if the dancing group is doing better than the singing group, when in fact their prospects for flourishing are equal (assuming dancing and singing enable individuals to have equal prospects for flourishing). With this problem in mind, Anna will want to be careful with the measurement of achievement and consider the possibility that group differences are driven by measurement issues and by particular group preferences for abilities-bundles, rather than true differences in prospects for flourishing. Clearly, group differences in achievement, such as differences in math achievement between boys and girls, can reflect true inequalities in prospects for welfare. Anna will have to be mindful of the comparison groups she selects and the corresponding assumption that the two groups, on average, have the same potential.

Even if groups have the same average achievement, there may be difference in prospects for welfare across individuals within the same group. This difference corresponds to the first problem of measurement described above, linking achievement levels to flourishing. Consider a group of individuals who have had every possible opportunity to develop potential. For this group, there will still be a distribution of achievement, reflecting different levels of cognitive capacity. The existence of this distribution suggests that the life prospects may differ among individuals due to differences in achievement, even if they have had the same opportunities to develop their potentials. Thus, addressing average group differences is not sufficient for addressing all differences in prospects for welfare especially if the within group distribution of achievement is very large.

Anna will need information about individuals' achievement (not only group averages) and, ideally, some information about differences in children's experiences, at least at the extremes. With this information, she can compensate the lower achieving students relative to others with similar experiences and she can compensate those with lesser experiences relative to others with similar achievement. No policymaker can accomplish a perfect equating of overall welfare, firstly, because of the difficulty of making trade-offs, but also because of the imperfect and potentially costly measures of achievement and experiences available. As a result, Anna will seek to identify substantial differences in prospects for welfare and compensate for those, but it is unlikely she will gather sufficient information to identify and compensate for smaller within group differences.

In summary, measurement constraints can substantially hinder Anna's ability to allocate resources across students. Between group differences in average achievement are useful indicators, as Anna will have strong reason to believe these differences stem from

differences in opportunities. She can direct resources to reducing average differences with confidence that she is addressing some aspect of achievement inequalities related to welfare. Within group differences are more difficult to measure and, as a result, Anna may focus only on clearly unequal prospects for welfare across students within groups.

#### The Framework in Use: Returning to the Cases

Let us take account. We offered outcomes an educational policymaker is concerned with: the level and distribution of current and future welfare. Prospects for welfare stem from various qualities that students develop. We refer to this conglomeration of knowledge, skills and attitudes as achievement. Students can have equal prospects for flourishing and yet have different bundles of the elements of achievement. Some may develop stronger reasoning skills, and others stronger relational skills. A student's welfare comes not only from the skills she develops but also from the opportunities that she has had to develop her potential. As a result, students may differ even in their overall level of achievement and still have equal welfare because students with higher native abilities will need to develop more capabilities to have the same benefit. Ideally, every child would receive the correctly specified and individuated combination of skills and attitudes necessary for equal and high prospects for welfare (balanced against childhood welfare), but such a perfect package is not likely given the constraints.

Non-ideal conditions strongly affect our policymaker's ability to reach her goals. Four constraints in particular will affect her decisions. First, resources are scarce, so policymakers will have to make difficult decisions between equalizing distributions and increasing the overall level of achievement-for-welfare. Second, resources are not just scarce but also in flux. The policymaker's decisions about how to allocate resources can affect the level or resources she has available to distribute in the next period. If she pursues equality too heavily, the amount of resources available for distribution in the next time series can be lower. Third, the high stakes nature of the labor market means that those on the low end of the achievement distribution are likely to have adverse life prospects. Anna must take this context into consideration. If stakes were lower, she would make different decisions about how to allocate resources. Fourth, and finally, measurement is imperfect, so Anna does not observe the full range of achievement possessed by each child. She also does not observe children's potential directly and so does not know for sure whether they have had equal opportunities to develop it.

This framework can be useful for Anna as she decides how to allocate resources across students and schools. It is also useful in understanding why some of the resource allocation decisions that we observe in practice have been made. In order to bring this framework to life, we return to the cases that we introduced early on and use them to illustrate how non-ideal conditions affect decision-making.

### *Case 1: Different backgrounds, different achievement levels*

This case includes two children from different socioeconomic backgrounds who have very different achievement levels. We said that Anna cares about the level of welfare (especially the welfare of the least advantaged), as well as the distribution of it. The level of achievement matters for welfare, as does having opportunities to develop one's natural ability. What do we know from the information provided? We know that the child whose achievement is lower is likely to have worse prospects for welfare down the road. With respect to the development of potential, we would need to see where these two children fall in the achievement distributions of their respective income groups. If they fall in about the same place and we assume that the distribution of native ability is the same across the two groups, then we would have reason to believe that the two children have had different chances to develop their native potential. Here, we see that the child from the low socioeconomic background is worse off because of the difference in achievement level (and the resultant differences in prospects for flourishing) and, possibly, the difference in the development of potential.

The budget constraint means that she will have to use some resources that would otherwise go to improving achievement, and therefore prospects for welfare, for other students. In cases where the costs to raise achievement equal amounts are the same between the two children, Anna's principled commitment is to raise the achievement of the child from the low socioeconomic background. This commitment arises because equal cost for equal achievement gain means that average achievement will be the same regardless of whose achievement she raises. As Anna cares about averages and improving the less advantaged, if the average is unaffected by her distributive choice, she will prioritize the child who is worse off.

What constrains her decision in this case is that her distributive decision will affect her ability to help low achieving students in the future. By choosing to devote all resources to one child or one group now, Anna may lead those who receive none of the resources to elect a different person, or choose to tax themselves at a lower rate, and these decisions could lower the available resources she has to spend in the future.

In cases where the costs to raise achievement of the student from the low income background are greater than the costs to raise achievement of the student from the high income background, Anna's constraint is two-fold. First, because she cares about using resources both to improve prospects for the worst off and to improve average levels, she will try to find an optimal distribution that improves the prospects for welfare of the lower achieving student a great deal, while using some resources to improve the prospects of the higher achieving student as well. How much weight she should give to improving welfare at

the bottom and the average will depend on how much she weights her two goals. Second, as before, she still must consider her capacity to help low achieving students in the future. If, by choosing to devote all resources to one child or one group now, those who receive none of the resources choose to elect a different person, or choose to tax themselves at a lower rate, this will lower the available resources she has to spend in the future.

The conclusion from this case is that given the four parameters of the framework and the outcomes she desires, Anna will consider compensating the child from the less resourced family. Her stance is driven by wanting to compensate for differences in welfare—welfare that is affected both by relative achievement differences and different development of potential. She will try to find some amount of resources that improves the prospects of welfare for the lower achieving student that is sensitive both to average levels and to maintaining resources for future students.

#### *Case 2: Different backgrounds, same achievement levels*

This second case includes two children from different socioeconomic backgrounds who have the same achievement levels. In this case, we have some evidence that the two children had different opportunities to develop achievement; but that despite this inequality, the two children have the same level of achievement. Here, Anna can be reasonably sure that, insofar as achievement is concerned, the two children will have similar life prospects. Whatever flourishing benefits are associated with a level of achievement, these two children should receive the same amounts. If welfare was completely determined by achievement level, there would be no compelling reason to compensate one child over the other.

What animates Anna is that she has reason to believe the child from a low socioeconomic background has developed less of her native potential than the other child. The evidence for Anna's conclusion is that the child with the lower socioeconomic background scores much higher in the achievement distribution for her social class, compared to where the other child falls in the achievement distribution for her social class. Now it could be that Anna's conclusion is incorrect and the child with seemingly fewer resources happens to have particularly devoted parents. However, on average, Anna is likely to be right and, as a policy maker, she is willing to be wrong on occasion in order to be correct in most cases. Because developing one's potential matters for one's welfare, there is reason to compensate the child from the low socioeconomic background.

Many of the same principled and practical constraints described above will apply here as well. Whatever compensation is required will face the problems of scarcity and fewer resources in the next time period.

An additional problem Anna faces here is the composition of welfare from achievement level and development of native potential. Anna does not know how much of an individual's welfare comes from the level of achievement and how much comes from developing one's potential. Suppose, for example, that the two children have equal levels of achievement and those levels are very low; one of the children has a great deal of untapped potential. In this case, if having a low level of achievement means that one's life prospects are very bleak, then increasing both children's achievement levels may take priority over compensating the child who has had fewer opportunities to develop her potential. If, however, their levels are high enough that their prospects for welfare are reasonable, then compensating the child who has had fewer opportunities becomes more relevant.

The conclusion from this case is that Anna will consider compensating the child from the less resourced family even though her achievement is as high as that of the child from the more resourced family. If both of their achievement levels are very low, she may choose to give resources to both students. Her stance is driven by wanting to optimize welfare, with an emphasis on those whose prospects for welfare are lowest. She will consider compensating for differences in welfare stemming from different opportunities to develop potential, mindful of the fact that marginal welfare gains are larger for children whose achievement is at the low end of the distribution.

*Case 3: Same backgrounds, different achievement levels and costs to teach*

In this case, we consider three students who all come from similar socioeconomic backgrounds with seemingly similar experiences. Two of the children have low levels of achievement, scoring at the 5<sup>th</sup> percentile of achievement, while the third child has average achievement, scoring at the 50<sup>th</sup> percentile. We also know that improving the achievement of the first child is far less expensive than improving the achievement of the second child. Because they all come from families that are effectively the same in terms of the value they place on education and their spending preferences more generally, Anna can assume that they have had equal opportunities to develop their potential. Thus, their welfare does not differ because of differences in development of potential. However, in terms of prospects for welfare, the child scoring at the 50<sup>th</sup> percentile has higher prospects than the two children scoring at the fifth. This difference suggests to Anna that the two low-scoring children should receive compensation so that their prospects for welfare are improved.

Does the fact that one of these children can learn much more quickly matter for Anna's distributive question? It would be quite easy to preserve equality, so that neither of these two children end up worse than the other, given these differences in speed. Suppose the first child learns for twice the price of the other child. Maintaining equality simply means that this child should receive twice as many resources. This resource allocation would persist until both children caught up to the child scoring in the 50<sup>th</sup> percentile. At that



point, because the 50<sup>th</sup> percentile child learns at a rate somewhere between the first two, she will receive 1.5 times as many resources. This approach preserves equality and improves the welfare prospects for both disadvantaged students.

The principled constraint that competes with this analysis is a commitment to increasing average level of achievement (which is assumed to improve welfare prospects). The child who learns very quickly is just as badly off as the other. For fewer resources that child's prospects could be improved considerably. By preserving equality, this child's prospects are worse. Imagine if instead of being twice as expensive, the first child was 20 times or 50 times as expensive to teach. Preserving equality in this case would deprive the other child scoring at the fifth percentile a great deal of resources, achievement and welfare.

This dynamic means that Anna will once again have to consider the relationship between achievement and welfare and how much achievement is needed to improve one's life prospects a reasonable amount. Suppose we know that children who score at or above the 30<sup>th</sup> percentile have much better life prospects than those who score below it—this represents a discontinuity or “big jump” in welfare. In this case, Anna might be willing to favor the faster learning student, thereby leaving the other student behind, because getting the faster learning student to the 30<sup>th</sup> percentile will greatly improve her prospects for welfare. Here, a commitment to a high level of welfare has the effect of disfavoring the least advantaged student. If Anna only cared about the worst off, the consequence would be that none of the children make it to the 30<sup>th</sup> percentile (the hypothetical discontinuity) before she runs out of resources.

The conclusion from this case is that Anna will consider compensating the children with lower achievement. She will avoid leaving any student behind, but she will weigh the benefits of maintaining equality against the loss in overall welfare for the child who is less costly to educate. Her stance is driven by wanting to compensate for differences in welfare stemming from different achievement levels, while at the same time aiming for greater average welfare.

#### *Case 4: Same backgrounds, different achievement levels and parenting practices*

In the final case, two students have the same socioeconomic conditions but different parental strategies. These parental strategies result in one student with a lower achievement level and less of her potential developed than the other. Given the heuristic we provided, it is not possible to say that one child has developed more of her potential than the other, because the children come from the same socioeconomic background, making between-group comparisons impossible. However, in this case we made it explicit that the parenting practices had the effect of lowering achievement and developing less potential. That is, we expect the potential of children who receive one type of parenting to be the same as the potential of children who receive the other type of parenting but that

the measured achievement of the two groups is different. On the surface, the student with the parenting practices that lead to lower achievement should therefore receive some compensation on account of these differences. However, Anna recognizes that the information she has about a child's achievement is incomplete. A child may have other, unmeasured attributes that will be useful for welfare, currently and later in life. Moreover, she does not know the link between childhood experiences and current and future welfare. It may be that a happy childhood and a slightly less prosperous adulthood are, all things considered, better for total welfare than are an unhappy childhood and a more prosperous adulthood. These uncertainties influence Anna's decisions.

Anna is concerned that her measurement of achievement does not correspond to current and future welfare. She can use childhood experiences to help establish whether observed achievement will indeed be commensurate. Suppose that, in the case above, the lower scoring child had parents or guardians that were uninterested in her development and wellbeing. In this case, she might conclude that the differences in measured achievement will negatively affect the child's prospects for flourishing, and so should be compensated.

Consider an alternative possibility, one in which the parents of the child with lowered measured achievement do not believe that the measure of achievement accurately captures the knowledge, skills and attitudes that their child needs for flourishing later in life. The parents are giving the child potentially useful qualities – such as the ability to have positive personal relations and to gain happiness from experiences – that will serve her well in life but that Anna does not observe on her achievement measure. Learning these qualities requires that the child spends less time developing other elements of achievement—elements that Anna does measure. In this case, Anna may conclude that the differences in measured achievement are not predictive of the children's prospects for flourishing and will not compensate.

Finally, it may be that these same parents believe happiness in childhood to be a more important part of overall welfare than do the parents of the higher achieving child. In this case, Anna will have to decide whether this lower achieving child, despite having a happier childhood, will be prepared for a flourishing life as an adult, and whether the happier childhood compensates for a less than optimal adulthood. These are not easy decisions, but learning about why the two children have different achievement levels can inform Anna about how these differences in measured achievement will influence total welfare. If the two children, in fact, have equal prospects for wellbeing then Anna would not want to compensate the child with lower measured achievement.

The conclusion from this case is that Anna will consider compensating the child with lower achievement only if she thinks the differences in achievement will result in lower prospects for wellbeing. This difficulty in deciding whether to compensate come from her inabilities

to see the full range of achievement and the full relationships among childhood experiences, achievement and total wellbeing. Some students with lower observed achievement may have higher unobserved achievement and thus equal prospects for flourishing. Only when observed achievement is low enough that the prospects for flourishing are far lower than what she considers acceptable (as we discussed in Case 3), will she compensate.

Here, we have seen that the structure we provided—distal and proximal educational goals and feasibility constraints that affect how policy makers pursue those goals—usefully allows us to deconstruct the cases into their constituent parts. We do not provide solutions to the cases, as solutions involve decisions about how to weight average welfare against welfare gains for the least advantaged and how to weight current against future welfare, as well as knowledge of the particular empirical constraints faced by individual communities. Despite this lack of precise prescription, the framework produces general guidelines with only minimal structure.

## Conclusion

As policymakers or voters, we must decide how to allocate resources for schools across students and communities. We have introduced a framework for deciding how to allocate resources given a set of feasibility constraints and goals for students. We began with the straightforward assumption that the policy maker hopes that schooling will increase students' average prospects for wellbeing and emphasize improvements for students who are worse off. The attributes that students develop in school (and elsewhere) – what we call achievement – contribute to this wellbeing so the policy maker cares about the overall level of achievement and its distribution. We introduced the idea that individual welfare also increases when individuals have the opportunity to develop and utilize their natural capacities. Thus, the policy maker also cares about the level and distribution of this opportunity to develop capacity.

The innovation of this paper is describing real-world constraints faced by policy makers and showing how these constraints affect the decisions that they make. Four problems are noteworthy. First, the problem of scarcity reveals why policy makers must make trade-offs between the competing values of average and equal welfare. Second, the problem of community buy-in reveals why—even when costs to improving the prospects of the least-advantaged are the same as improving the prospects of the better off—policy makers may still target some resources to those who are high achieving. Third, the problem of the high stakes nature of achievement for welfare reveals why improving achievement at the bottom of the distribution is so important.

The final problem—that of measurement—has particular salience in our analysis. The policy maker seeks to measure achievement because it is her best guess at children's

prospects for well-being later in life. She also seeks to measure opportunities to develop capacities since those opportunities are important to wellbeing for children. Yet, she cannot measure either construct accurately. Our discussion above sheds light on how policymakers develop and use imperfect achievement indicators, like test scores, to inform decisions; it also points to what policymakers might use to compensate for the imprecision of measurement. The policy maker may aim to collect the fullest possible measure of achievement given available resources. This approach has the benefit of producing a broad measure but the measure clearly still will have holes and be costly. Alternatively, she may try to measure only the minimal level of each feature that is determined to be essential for the average flourishing of all students—points at which welfare from achievement increases substantially. This measure is incomplete, and she could then supplement it with some measures of student experiences, which can shed light on childhood welfare and opportunities to develop one’s capacities. This second approach has the benefits of breadth, sensitivity to experiences, and practicality, but there may be reasons for deeper measures of some factors.

It is common practice to make between-group comparisons in educational report cards and research, though it is not always clear what these metrics are useful for. Here, we have argued that these comparisons serve a purpose when measures of potential and individual bundles of achievement most useful for achieving welfare are unavailable. When this information is unknown, between-group comparisons are useful heuristics, as they reveal relevant differences in prospects for welfare resulting from undeveloped potential that merit compensation at the group, if not the individual, level.

By keeping focused on the eventual goals of education and the practical problems that make realizing those goals difficult, we have both some understanding of the distributive decisions that are made and some structure for thinking about – given our goals and constraints – what distributions we would like to see.