Timely Development: Visualizing Children's Growth and Potential

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Children's growth has long been measured against the axis of time. Yet anthropometric indexes such as age for height measurements do not simply mark the passage of time and associated growth but themselves indicate "norms" that stand as markers of potential. Charting changing modes of representing the problem of children's growth over the 20th century and into the 21st, this paper attends to visual technologies that distribute potential unevenly around the world, asking what is at stake in making children's growth and development visible, and whose potential is affirmed in the process?

Key words: *growth; development; stunting; potential; visual culture*

The most recent UNICEF, WHO, and World Bank (2021) joint malnutrition estimates suggest that in 2020, stunting—low height-for-age—affected 22% of children under 5 globally, rising to 34.6% of the same age group in countries classified as low-income. To contextualize this data the introduction to the report explained: "Children suffering from stunting may never attain their full possible height and their brains may never develop to their full cognitive potential" (p. 2). Stunting, first proposed in 1972 (Waterlow, 1972) as part of a set of metrics used to classify the severity of protein-energy malnutrition, was, by 1977, established as a label to signify low height-for-age (Sandler, 2021, p. 4). By the 1990s it had become "one of the most prominent indicators of childhood undernutrition for research and advocacy" (Perumal et al., 2018, p. 312). Currently defined as height-for age -2 standard deviations below the WHO growth standards median, stunting has been associated, not only with reduced stature, but with increased risk of infections, chronic disease, poor cognition, poor educational and maternal health outcomes, and reduced earnings in adulthood (de Onis & Branca, 2016; Victoria et al., 2008). Children affected by stunting are thus marked by time in two ways: first, in the present, where their growth falls behind where it "should be" for their age, and second, into a future in which they will never reach their "full potential." For scholars of children and childhood, this hollow, reductive, and instrumental imposition of time onto the bodies of children requires the same level of critical interrogation as has been given to the figure of "the starving child" (see Burman, 1994; Manzo, 2008) and to anxieties about childhood obesity (see Eßer, 2017; Evans, 2010; Ryan, 2014).

It has been over a decade since Barrie Thorne (2007) described the "wall of silence between the 'new social studies of childhood' and the field of child development" (p. 150) and called for "complex articulation of different types of temporality—historical, generational, chronological, phenomenological, developmental, biological" (p. 150). Despite numerous attempts within childhood studies to break the "bio-social dualism" (Lee & Motzau, 2011) or

"explode the boundaries of the biosocial nexus" (Ryan, 2011), we have remained largely silent in regards to the now dominant biomedical paradigm of stunting. Enshrined in the Sustainable Development Goals (SDGs) and supported by key global health actors such as the Bill and Melinda Gates Foundation, stunting and its related paradigms reduce "meaningful" intervention into children's development to an ever-shrinking window of the first thousand days (Pentecost, 2018). To understand the naturalization of this paradigm, I begin as Bruno Latour (1986) suggests, with "inscriptions and their mobilisation" (p. 27). Documenting visual modes of representing children's growth "deficiencies" to a range of audiences from the early 20th century, this article attends to both how time is revealed in children's bodies and how children are in turn located "in time" within specific evolutionary and developmentalist teleologies.

The concerns that drive this article emerge out of the dissonances between the context of my own previous ethnographic work with children in Delhi's slums and damning statements such as the following made by two leading WHO experts in 2016: "Stunted children have stunted brains and live stunted lives, hampering the development of entire societies" (de Onis & Branca, 2016, p. 13). Despite numerous reports that suggest India is home to one-third of all stunted children, the children that I worked with—while grappling with the hardships of what Akhil Gupta (2012) calls the "life-denying consequences of chronic poverty" (p. 4)—could not be described as living stunted lives. To understand such expert commentary thus requires attending to developmentalist theorizations of time. These, as Gupta (2002) outlines, not only emplot "individual lives into different stages but cultures and nations as well into primitive, backward or underdeveloped, developing, and developed or advanced" (p. 18). This periodization, as Olga Nieuwenhuys has put so clearly (2013), became possible "only when both the child and the colonized could be envisioned as representing imperfect specimens of the enlightened European man" (p. 5). The simple slippage between "the child and the colonized"—or, as above, "stunted lives" and "stunted societies"—is accomplished via techniques of measurement and inscription that facilitate easy mobility and modifications of scale (Latour, 1986, p. 19). These techniques, as J. M. Tanner (1981) has remarked of growth measurement, have "by no means always been benign" (p. 397). Yet, the contested histories of these measurements are, as Tom Scott-Smith (2013) describes, frequently concealed, an erasure which in turn contributes to the depoliticization of poverty and the production of technical fixes rather than structural change (see also Worboys, 1988).

Thus, in order to repoliticize modes of representing children's growth, this article adopts Heide Fehrenbach and Davide Rodogno's (2015) methodological approach, from their incisive article exploring the figure of the child in humanitarian photography. Specifically, I follow Fehrenbach and Rodogno in drawing on "select moments and materials from multiple archives" (p. 1123) to historically contextualize contemporary practices of representing and communicating deficiencies in children's growth. Grappling with the changing ways humanitarians have used photographic media to "disseminate affecting tropes and narratives … in order to train the ethical impulses of viewers" (p. 1124). Fehrenbach and Rodogno begin their article with discussion of the 2015 photograph of the body of 3-year-old Alan Kurdi. To contextualize this image within their ongoing research into the visual politics of humanitarianism, they offer a series of juxtapositions and comparisons with images from the past. This approach does not allow for complete or "comprehensive historical or theoretical analysis" (2015, p. 1123) but rather makes concrete the practice of archival research as a process of following, collating, and comparing.

Navigating my "archive"—a vast and disparate set of journalistic reports, medical papers, and humanitarian periodicals and grey literature by organizations such as UNICEF, the Save the Children Fund (SCF), the Red Cross, the U.S. Children's Bureau, the Freedom from Hunger Campaign, and the World Health Organisation—I seek to follow and document the malnourished child as she is constructed, via a range of inscriptive devices, as a figure "in time." Building on the existing literature on both statistical representations and photographs (Adams, 2016; Dumit & de Laet, 2014; Glasman, 2020; Kind-Kovács, 2016; Turmel, 2008; Yates-Doerr; 2017) in this article I focus

primarily on two forms of inscription: before-and-after photographs, and images of children being measured. To contextualize this choice, I turn now to a brief discussion of the way time is marked and made visible in late-19th-century developmentalist projects to record, monitor, and predict children's growth.

Making time; making time visible

In 1880 Percy Boulton, physician at the Samaritan Hospital for women and children, was able to recall that as recently as ten years earlier he had "no idea how much a child should grow in a year," making his early efforts at weighing and measuring children "practically useless" (Steedman, 1995, p. 74). To make his own data "useful" Boulton needed to locate his measurements in "time," something he eventually achieved by looking to the work of Belgian scientist-statistician Adolphe Quetelet (1842, p. 58). Quetelet had, in his *A Treatise on Man and the Development of his Faculties* (1842), compiled the height and weight measurements of children from "various charities, hospitals, public schools [and the] Prison of Vilvorde" (p. 58). Although all his measurements were tabulated against age, Quetelet's commentary on techniques of measurement did not for the most part extend to questioning the accuracy or methods of determining the age of these often highly marginalized child subjects. Age was the seemingly straightforward component of his data, one that he suggested could even be rendered useless with the development of exact tables of weight and physical qualities of the "average man" that could do away with the need to know the age of a subject in advance. Explaining the importance of his project to determine the properties of the average man, Quetelet wrote that "it is almost impossible to judge the state of an individual without comparing it to that of another imagined person" (p. 99). Yet, while Quetelet made it clear that the *properties*—height, weight, strength, swiftness, etc.—of this "imagined person" could "scarcely be realized" in individual men (p. 100), he assumed that the temporal column of his tables, marking age in years or months, remained constant and shared by all measurable individuals. Yet, what if the temporality of the average man was just as imaginary and hard to realize as his properties?

Despite being, as Quetelet (1842) put it, "imagined," the "average man"—made concrete through an array of inscriptive devices such as tables, graphs, charts, etc.—has become, as well documented in contemporary science and technology studies (STS), an incredibly powerful biopolitical force. For Dumit and de Laet (2014) "biometric and demographic statistical operations are agents" that not only "*perform* idealized, typed bodies and selves" but also "*produce* the very bodies that populate the accounts which are illustrated by the graphs" (p. 73, emphasis in original; see also Turmel, 2008). Arguably these operations also produce the patterned and predictable temporalities these bodies inhabit. Thus, when Francis Galton (1874) proposed to measure school children to determine "the law of growth in different classes" (p. 301) and American pediatrician Louis Starr declared in the introduction to his 1900 *An American Textbook on the Diseases of Children* that "'under normal circumstances' children grow in height and weight according to a 'regular rate'" (as cited in Chudacoff, 1989, p. 52), neither man simply documented these rates or laws but actually produced them. This production was subsequently naturalized by range of inscriptive devices. To introduce some of these devices I begin in the early decades of the 20th century, looking first to the UK, then to the US.

Picturing physical deterioration and training for health

Figure 1. Photographs presented by Inspector of Schools Dr. Eiccholz to the Inter-Departmental Committee on Physical Deterioration (1904).

In 1903, the Inter-Departmental Committee on Physical Deterioration was established in response to concerns about the declining physical quality of British military recruits in the aftermath of the Boer War. The committee, keen to preserve "Britain's status as a global power" (Nott, 2019, p. 558), quickly recognized the "extreme importance of nutrition" (Nott, p. 558) and thus turned its attention to the plight of impoverished school children. In his testimony to the committee on this matter, Inspector of Schools Dr. Eiccholz used two modes of inscription—graphs and photographs—to support his claim that "the savage type" of child had disappeared from the streets of London. The savage type, defined by Dr. Eiccholz as "wild, unkempt, loosely built, ragged, barefoot children, who look like savages and not like human beings" (as cited in Fitz Roy, 1904, p. 29), was illustrated by a series of posed class photographs (Figure 1) featuring children from schools labelled as being of "the lowest type." Dating back to 1875 these images depicted a "base line" and several degrees of improvement, the most significant of which was visible, as Dr. Eiccholz claimed, in the second generation of children to benefit from schooling (as cited in Fitz Roy, 1904). Alongside the "appearance of wellbeing as shown in the firm and resolute countenance" of children in the school photos, Dr. Eiccholz submitted graphs of children's height measurements (Figure 2) plotted against children described as "the best type of British middle-class child" (Fitz Roy, 1904, p. 21).

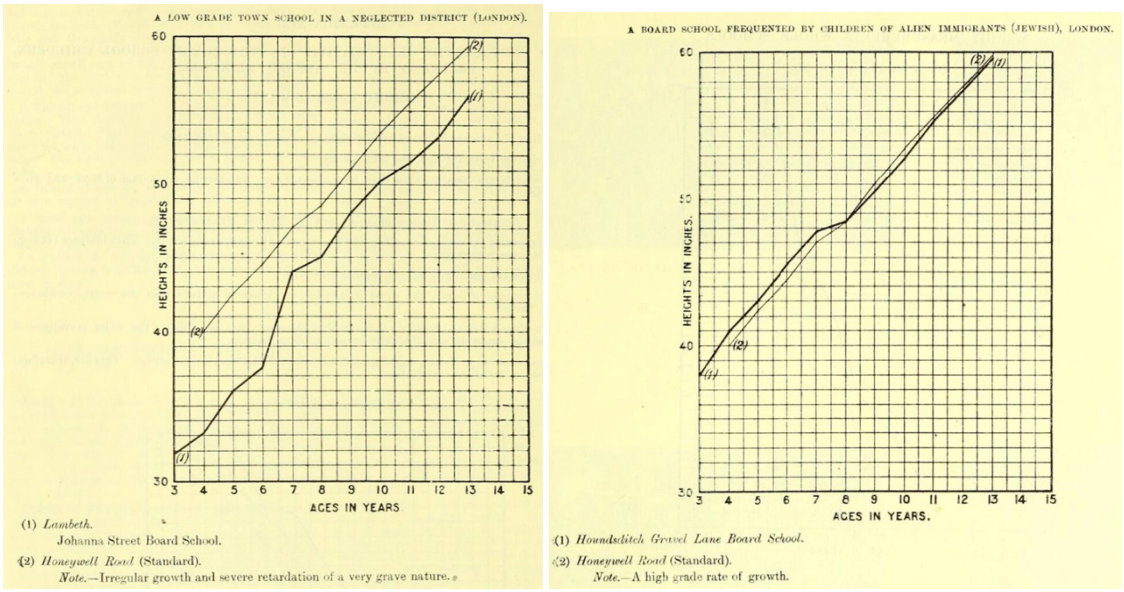

Figure 2. Graphs presented by Inspector of Schools Dr. Eiccholz to the Inter-Departmental Committee on Physical Deterioration (1904).

Also testifying to the committee was the chairman of the British Association for the Advancement of Science, Professor D. J. Cunningham, who, alongside Mr. J. Gray, presented a proposal for a Central Anthropometric Bureau with a ten-year program to survey each county in England, Scotland, and Ireland (Fitz Roy, 1904, pp. 8–10). The committee, balking at the length of such a program, recognized that "in all probability it will not be easy to induce people of all classes to submit to investigation" (Fitz Roy, 1904, p. 11). Instead—pointing to the institutional structures of compulsory schooling and the administrative requirements of the Factory Acts— it suggested that it would be far easier to gather this data for children. In turn it argued that "operations in the schools would familiarise people with the method" (Fitz Roy, 1904, p. 11). While Mr. Gray noted that efforts to measure adult populations in Ireland were "a constant source of trouble … even with the assistance of the parish priest" (Fitz Roy, 1904, p. 11), such problems were not anticipated with children, who by the turn of the century were already naturalized as amenable and available subjects of measurement. Demonstrating this, as early as 1874 Francis Galton had claimed in his proposal to the Royal Anthropological Institute to study school children that "the boys when they grow up into men will retain favourable recollections of the whole procedure" (Galton, 1874, p. 309).

Galton himself was deeply invested in the project of familiarizing the public with the new sciences of measurement. In 1884 he measured 9,337 people in "17 different ways" in his Anthropometric Laboratory at the International Health Exhibition (Galton, 1885). The importance of exhibitions, fairs, and shows for promoting the new sciences of child measurement and observation was also recognized in America, where the first "scientific baby show" was organized by Cora Bussey Hillis at the Iowa State Exposition in 1908 (Smuts, 2006, p. 122). A report on one "baby-saving show" held in Philadelphia in 1912 noted that,

> relatively recently, educational exhibits have come into vogue and our limited experience of them has clearly shown that they must be reckoned among, if not considered the most efficient, means at our disposal for the dissemination of knowledge and the stimulation of public opinion. (Child Hygiene Committee of Philadelphia, 1913, p. 10)

The newly formed United States Children's Bureau likewise quickly recognized the importance of exhibits, developing

an elaborate display for the 1915 Panama Pacific Exposition, which contained a series of living demonstrations that included free medical examinations of children under 15 years (Figure 3 left) as well as animated exhibits and fixed visual displays (Strong, 1915). One wall panel (Figure 3 right) entitled "What mother's milk did for this baby," was illustrated by a before-and-after photograph of a malnourished infant.

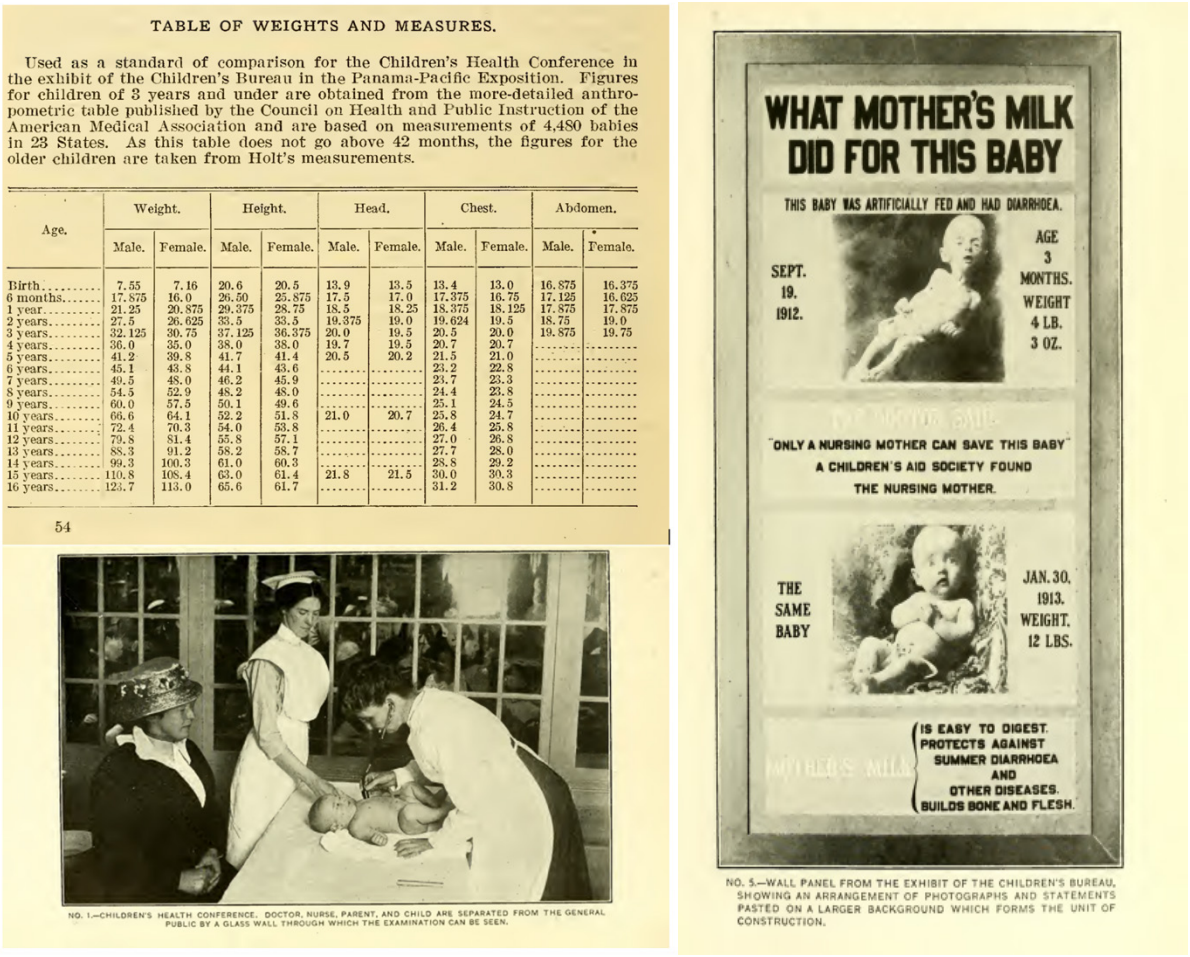

TABLE OF WEIGHTS AND MEASURES.

Used as a standard of comparison for the Children's Health Conference in the exhibit of the Children's Bureau in the Panama-Pacific Exposition. Figures for children of 3 years and under are obtained from the more-detailed anthropometric table published by the Council on Health and Public Instruction of the American Medical Association and are based on measurements of 4,480 babies in 23 States. As this table does not go above 42 months, the figures for the older children are taken from Holt's measurements.

Age.	Weight.		Height.		Head.		Chest.		Abdomen.	
	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.
Birth	7.55	7.16	20.6	20.5	13.9	13.5	13.4	13.0	16.875	16.375
6 months	17.875	16.0	26.50	25.875	17.5	17.0	17.375	16.75	17.125	16.625
1 year	21.25	20.875	29.375	28.75	18.5	18.25	18.375	18.125	17.875	17.875
2 years	27.5	26.625	33.5	33.5	19.375	19.0	19.624	19.5	18.75	19.0
3 years	32.125	30.75	37.125	36.375	20.0	19.5	20.5	20.0	19.875	19.75
4 years	36.0	35.0	38.0	38.0	19.7	19.5	20.7	20.7	.....	.....
5 years	41.2	39.8	41.7	41.4	20.5	20.2	21.5	21.0	.....	.....
6 years	45.1	43.8	44.1	43.6	.....	.....	23.2	22.8	.....	.....
7 years	49.5	48.0	46.2	45.9	.....	.....	23.7	23.3	.....	.....
8 years	54.5	52.9	48.2	48.0	.....	.....	24.4	23.8	.....	.....
9 years	60.0	57.5	50.1	49.6	.....	.....	25.1	24.5	.....	.....
10 years	66.6	64.1	52.2	51.8	21.0	20.7	25.8	24.7	.....	.....
11 years	72.4	70.3	54.0	53.8	.....	.....	26.4	25.8	.....	.....
12 years	79.8	81.4	55.8	57.1	.....	.....	27.0	26.8	.....	.....
13 years	88.3	91.2	58.2	58.7	.....	.....	27.7	28.0	.....	.....
14 years	99.3	100.3	61.0	60.3	.....	.....	28.8	29.2	.....	.....
15 years	110.8	108.4	63.0	61.4	21.8	21.5	30.0	30.3	.....	.....
16 years	123.7	113.0	65.6	61.7	.....	.....	31.2	30.8	.....	.....

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NO. 1.—CHILDREN'S HEALTH CONFERENCE. DOCTOR, NURSE, PARENT, AND CHILD ARE SEPARATED FROM THE GENERAL PUBLIC BY A GLASS WALL THROUGH WHICH THE EXAMINATION CAN BE SEEN.

NO. 5.—WALL PANEL FROM THE EXHIBIT OF THE CHILDREN'S BUREAU, SHOWING AN ARRANGEMENT OF PHOTOGRAPHS AND STATEMENTS PASTED ON A LARGER BACKGROUND WHICH FORMS THE UNIT OF CONSTRUCTION.

Figure 3. Images from Anna Louise Strong (1915) Child-Welfare Exhibits: Types and Preparation, US Children's Bureau Publication No. 14, Washington: Government Printing Office.

The American Red Cross (ARC) was also during this period involved in the project of familiarizing the public with new measurement technologies (Figure 4). Their 1919 publication *Watch New York's Children Grow* documented the development of nutrition classes in New York (Figure 4). While the booklet emphasized the expertise of the doctor, it also detailed a number of visual strategies for recruiting children and their mothers into competitive projects of "growth seeking." One example required "affixing stars of various colours" to a child's weight chart, and another involved posting the names of children making the "highest gains" on a bulletin board (American Red Cross, 1919, p. 27). In a paper by William Emerson (1919) published in the proceedings of the U.S. Children's Bureau Conferences of 1919, this kind of "class method" was described as appealing to children's imaginations: teaching and inspiring the child "to 'train for health' in the same way he trains to be a boy scout or a good athlete" (p. 241). Thus, Emerson claimed, children of 7 or 8 will make all kinds of sacrifices and modifications to their behaviour just so "he may see his weight line go up each week and the stars registered on his chart" (p. 241). Emerson's claims about children's engagement with their own weight chart suggest the need to ask: what exactly

is it the child sees on the chart and how might it differ from what the physician sees? Furthermore, his comments suggest the need to interrogate whether time is structured differently when graphs are individualized compared to those that capture data for populations such as schools. Finally, we might ask how visual representations of measurement—such as the beautiful illustrations in *Watch New York's Children Grow*—naturalize the inscription of time onto children's bodies and, in turn, locate children in or out of time.

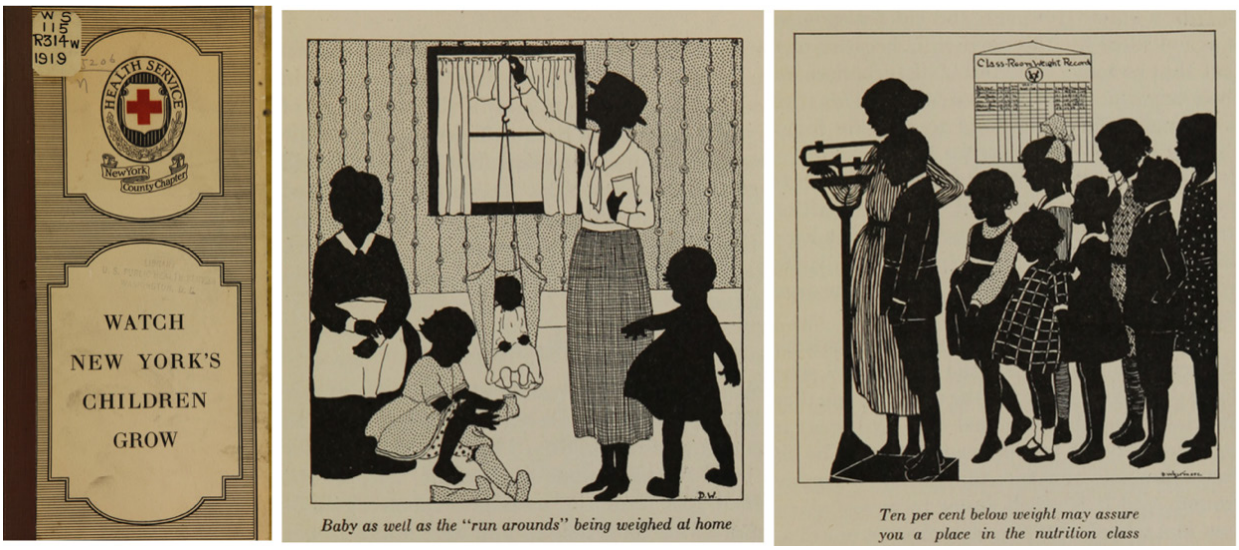

Figure 4. Cover and pages from Watch New York's Children Grow 1919, Health Service, New York County Chapter American Red Cross in cooperation with the Child Health Organization of America.

Seeing is believing

To try and answer some of these questions in a slightly different context, in the next part of this article I turn to efforts that take place internationally under the sign of humanitarian relief or development aid. While I have already mentioned some of the efforts of the ARC at home, in the post-World-War-1 period the ARC was also working in Europe to allocate relief alongside a range of organizations that included the Save the Children Fund (SCF). During this period, SCF, as Emily Baughan (2022) describes, pioneered new modes of representing human suffering, stripping and posing children deemed sufficiently emaciated and editing images to show children alone, and in the process defining the "genre of humanitarian film and photography for a century to come" (p. 65). Specifically enthusiastic about film, the SCF "adopted the motto 'Seeing is Believing' and put great effort into promoting their famine movie," with an article in *The Record* suggesting it "aroused emotions akin to those engendered by an autopsy" (Gotz et al., 2020, pp. 101–102).

Yet, while powerful as a fundraising tool, simply "seeing" was insufficient when it came to relief delivery. Thus, on the ground ARC health professionals allocated relief only to children whose bodies—"undressed, measured and photographed"—demonstrated a departure from established nutritional norms and standards (Kind-Kovács, 2016, p. 54). The importance of expert visualization was explained to the American child readers of the *Junior Red Cross News* (JRCN) from October 1919 as follows:

> When Rheims Cathedral is torn and wounded by German guns, our eyes can see the horror. What the eyes of great physicians see in the infinitely delicate structure of these children's bodies is hidden from us, but ruin and disaster are there, more terrible than broken stone. (p. 6)

Like the above metaphor, one of the central problems that these images sought to address was the "invisibility" of malnutrition and the subsequent need for expert visualization. While the metaphor of Rheims Cathedral offered by the ARC clearly emerges from the context of the First World War, concerns about invisible malnutrition persisted and recurred throughout the 20th century, demonstrated here in the UNICEF State of the World's Children report from 1994:

> Only 1% or 2% of the world's children exhibit visible signs of malnutrition. But an estimated 190 million children under five are chronically malnourished, locked early into a pattern of ill health and poor development.... When nourishment runs low, the human body makes compromises to keep going. Mostly, these compromises are invisible—or visible only later to those with growth charts to measure the rate of stunting. Virtually the only outward sign is sluggishness....Undernourished children stand rather than run and play, sit rather than stand.... Even if nutrition improves thereafter, the child is likely to suffer from below-normal growth, affecting physical and mental development and compromising the future of children and their nations. (p. 16)

This quote demonstrates clearly the way certain measurement technologies are required to reveal temporal faults that range from "sluggishness" and "poor development" to "compromised futures." To better understand how these temporal faults are naturalized via particular measurement technologies, in the following section I explore how organizations and practitioners working in the global South employed a range of inscriptive devices to measure and represent the problem of "invisible" malnutrition.

New measurement devices: TALC and MUAC

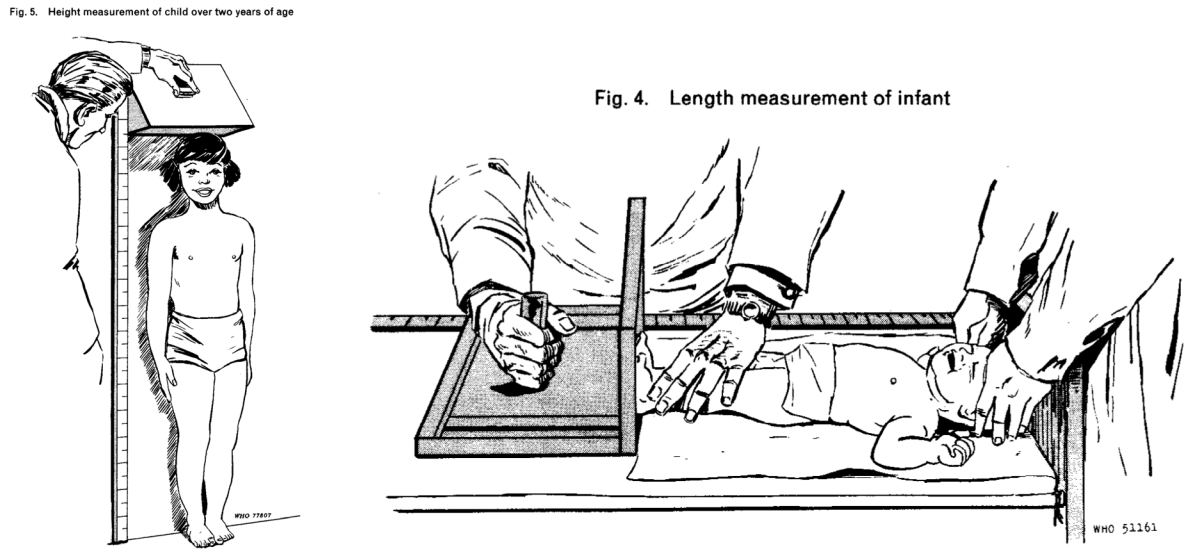

Figure 5. Illustrations published in Derrick Jelliffe (1966) The Assessment of the Nutritional Status of the Community, pp. 68–69.

In his 1966 guide for medical fieldworkers, tropical pediatrician Derrick Jelliffe, like the Red Cross before him, emphasized the importance of specific medical knowledge and expertise, writing:

> The cheapness and relatively easy organization of nutritional assessment by means of clinical examination have sometimes led to the assumption that the method is simple, quickly mastered by the beginner, yields results that are easy to interpret. This is not the case. (pp. 10–11)

To visually support this claim Jelliffe (1966) included several diagrams illustrating methods and equipment

involved in the proper measurement of children, accompanied by complex descriptions (Figure 5). Describing when to use length rather than height measurements, Jelliffe observed that "for infants and pre-school children, recumbent length (crown-heel length) has to be employed, as the measurement of standing height is either impossible or very inaccurate with an uncooperative child" (p. 68). Perhaps in search of easier means of measuring potentially disgruntled child subjects, Jelliffe and his team had in 1958 in Haiti pioneered the use of the mid upper arm-circumference (MUAC) measurement with children (Glasman, 2020, p. 96). While initially used alongside other anthropometric measurements, MUAC assessment—which was easily facilitated without cumbersome equipment—was adopted by the International Committee of the Red Cross (ICRC) in Biafra in 1969 as a tool to assess community nutritional status.

Yet in Biafra, ICRC teams faced the difficulty of not knowing children's ages, and as a result relied on a range of other surveys to try to deduce age from height measurements (Glasman, 2020, p. 101). One of these surveys was developed by pediatrician David Morley, who himself designed a series of "Teaching Aids at Low Cost" (TALC) to be used in resource-poor settings. Alongside his colour-coded weight-for-age chart (Figure 6, left) Morley later produced a colour-coded MUAC tape with three sections—red, green, and yellow—with red signifying "malnutrition." As Joel Glasman (2020) explains, this tape

> was a Trojan Horse for several plausible yet still unproven assumptions: That the same standard could be used everywhere, was applicable independent of age (for children aged one to five years), was for boys and girls alike, and that it made sense to focus specifically on young children to assess entire populations. (p. 106)

Glasman (2020) explains that the slow growth in a child's arm circumference between age 1 and 5 had become a self-filling prophecy of sorts: "Because this population *can* be compared using MUAC, it should be targeted by *aid*." (p. 95, emphasis in original). Yet, while consolidating a focus on a specific age group, MUAC's five-year window does not require precise determination of age, minimizing the "need for expert presence" (Scott-Smith, 2013, p. 917). This raises interesting questions about the relationship between expertise and the construction and measurement time.

Figure 6. Left: Children being measured against a TALC chart and with a MUAC tape, The World's Children NSW edition, June 1982. Right: The World's Children, UK edition, June 1979.

While scholars such as Glasman (2020) and Scott-Smith (2013) have detailed how the MUAC tape is today fetishized as a humanitarian object, this focus has not always included recognition of how this fetishization is sustained, in part, by the presence of the child. Examples of both MUAC and TALC in action from the 1970s and 80s (see Figure 6), as well as the continuing presence of images of children being measured in development literature today (see Figure 7) indicate the need to think more about the importance of the child figure both in relation to highly mobile technologies and more cumbersome instruments of measurement. The earlier images likewise indicate the mobility of these "measuring photographs" themselves. One photograph of a Nepali girl being measured by a MUAC tape was represented to UK readers of the Save the Children periodical *The World's Children* in 1979 in an article entitled "Babies Cannot Wait" (Figure 6 left) and then later to an Australian audience of the same periodical in 1982 under the headline "How Children Suffer" (Figure 6 right). The latter article reiterates that "except in serious cases it is not possible to tell if a child is malnourished just by looking at him." Prefiguring the language of the UNICEF report discussed above, the article notes that "long-term lack of nutritious food leads to stunted growth and apathy. Young children have little interest in play … while school children don't have the energy to take an active part in classwork" (Save the Children Fund, 1979, p. 4).

Figure 7. Left: UNICEF 2019 State of the World's Children, p. 120. Right: UNICEF (2013) Improving Child Nutrition: The Achievable Imperative for Global Progress, p. 55.

Nutrition conviction: Faith in development

To continue to grapple with the relationship between visuality and temporality, this time in relation to before-and-after images, I want to return to Derrick Jelliffe. In his 1969 handbook *Child Nutrition in Developing Countries* Jelliffe introduced a variety of visual and audiovisual educational aids including flip charts, flannel graphs, flash cards, puppets, and films to promote nutrition conviction (p. 99). Yet, he ultimately stressed that "a real life situation, using actual material is the most vivid teaching aid, most likely to be understood and most certain to produce a lasting impression" (p. 108). Specifically, he noted that in order to convince mothers that malnutrition is the result of incorrect diet "under some circumstances, photographs of children on admission and discharge may help" (p. 99; see Figure 8). This recommendation emerged from his observation that, in hospitals and nutrition rehabilitation centres, "the mother may find it difficult to believe that the recovery is related to the better diet the

child has been receiving and may be more inclined to think of the cure being effected by various other 'mystical' hospital procedures, such as injections, temperature taking, x rays, and so forth" (p. 99). Whether these before-and-after photographs were able to convince mothers is worthy of further interrogation, as are the "mystical" time-collapsing qualities of before-and-after images themselves.

FIGURE 13.—Nutritional conviction. Two-year old child with marasmus on admission to the Nutrition Rehabilitation Unit, Kampala

FIGURE 14.—Nutritional conviction. Same child after six weeks of high protein diet based on local foods

Figure 8. From Derrick Jelliffe (1969) Child Nutrition in Developing Countries: A Handbook for Fieldworkers, pp. 100–101.

Yet these mothers were not the only ones doubting the results of various nutrition intervention programs. In 1973, a girl named Julie from regional Victoria in Australia wrote to the national office of the Australian Freedom from Hunger Campaign (AFFHC). Her letter described her work in a Red Cross group "collecting clothes for children," thus marking her own participation in projects of development. However, the purpose of Julie's letter was, it seems, to make several critical points about the images used by development organizations. Julie stated: "There has been a lot of money being raised over the years, though I have not seen much improvement in the pictures I have seen." In his response to Julie, Alan Smith, the national director of AFFHC, wrote: "Unfortunately, there is a tendency for the newspapers, television and some of the aid organisations to highlight the horror pictures." And, in fact, the AFFHC had themselves been critiqued for such practices eight years earlier in September 1965 in a debate in the Indian parliament. A copy of the debate—included in the AFFHC manuscript collection in the National Library of Australia—indicates that it was sparked by a discussion of AFFHC's contributions to nutrition programs in India. In response, parliamentarian D. C. Sharma asked whether the Indian government was

> aware of the fact that freedom from hunger campaign in most of the western countries of the world paints a very very dark picture of India, showing children with bulging bellies and men and women who are semi naked.

While coming from very different perspectives, both Julie's letter and D. C. Sharma's comments highlight the inability of stand-alone images of starving children to signify development, progress, and potential. Likewise, as political critiques, both comments highlight the dangerous ways in which single images may fix children, nations, or organization in time.

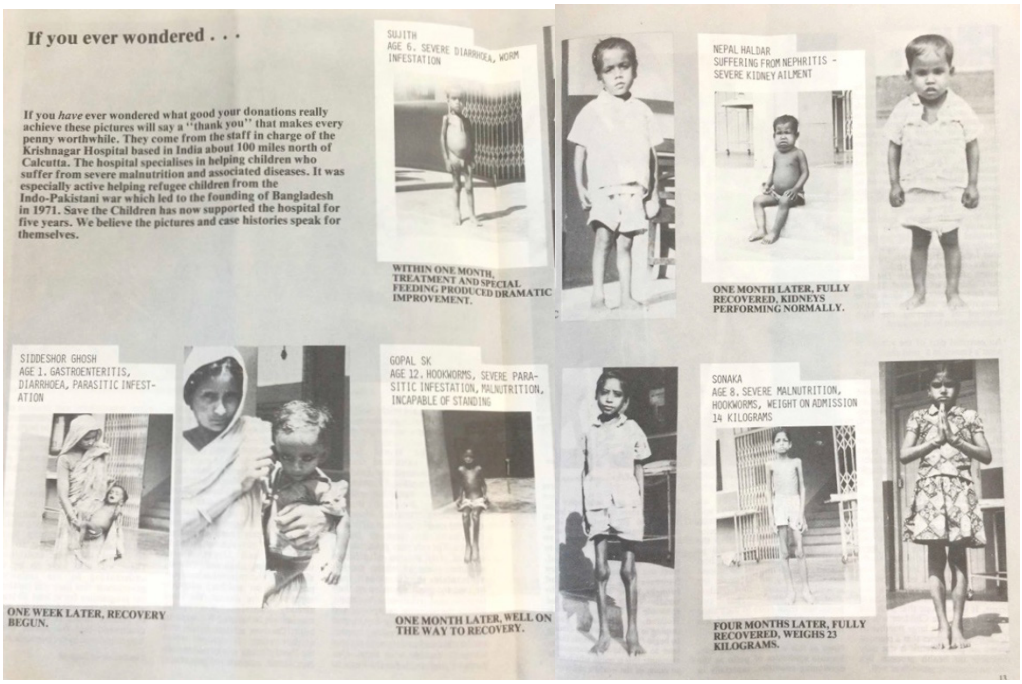

Figure 9. The World's Children, December 1978, pp. 12–13.

BOX 1.1 | Caring for wasted children at home

Recent years have brought significant breakthroughs in the treatment of SAM, notably with the rolling out of community management of acute malnutrition (CMAM) in many countries. Before CMAM, children with SAM were typically referred for lengthy and expensive in-patient hospital stays, a burden on many families that contributed to low rates of treatment. The CMAM approach instead empowers families to treat SAM at home, usually with ready-to-use therapeutic foods (RUTF) for children without medical complications, which comprise the majority of cases.

This approach has improved survival rates and has proved highly cost-effective, although more needs to be done to lower costs, for example through local production of RUTF).[27] While management of SAM is among the 10 highest impact nutritional interventions to reduce child mortality,[28] this impact can potentially be boosted still further: For example, health services that provide early detection of both SAM and HIV can be critical in improving survival rates among children by facilitating interventions at a critical point in disease progression and child development.

Born in the rural Philippine province of Palawan, Joemar comes from a deprived family in which both parents have suffered health problems. The family's ethnic community has limited access to services and understanding of malnutrition. As a result, and despite showing clear symptoms, Joemar was not immediately diagnosed as suffering from severe acute malnutrition. Once treatment began, he made swift progress, doubling his weight in just a few months. Just like Joemar, more Filipino children are now getting a second chance: Supported by UNICEF, the Philippines is scaling up services and capacities to prevent and treat acute malnutrition and, by 2022, aims to put in place a nationwide programme of interventions, with a strategic focus on the first 1,000 days.
© UNICEF/Philippines/2016

Figure 10. UNICEF State of the World's Children 2019.

To perhaps address these concerns and continue to proclaim the success of their programs, development

organizations have long utilized before-and-after images. A double page spread from *The World's Children* from December 1978 (Figure 9) declared that these pictures and case histories from the Krishnagar Hospital in India "speak for themselves" (Save the Children Fund, 1978, p. 12). These kinds of images continue to be used regularly in development publications, such as the sequence of four photographs that appear in a "fact box" about "Caring for Wasted Children at Home" in the State of the World's Children report from 2019 (Figure 10). What is seen here is development in a comparative mode. While these comparisons follow a single child over time and signify both the progress of an individual and the success of a development intervention, other comparative modes contrasting children in the global South with children in the global North consolidate impressions of both underdevelopment and temporal difference.

Figure 11. Australian Foreign Affairs Record, December 1983. Left: cover; right: p. 775.

The UNICEF images in Figure 11, both published in the *Australian Foreign Affairs Record* in 1983, introduced UNICEF's "Children's Revolution." Seeking to save the lives of up to seven million children each year, this program was based around four low-cost interventions: growth monitoring, oral rehydration therapies, breast feeding, and immunization. In the image on the right we see the "energy output" of African and European children illustrated both by a photo and a pie chart. As with previous references to "sluggishness" and "apathy," David Morley (1984), in his essay in UNICEF's 1984 *State of the World's Children report*, wrote in support of growth monitoring that

> a child who is malnourished will conserve his or her energy for survival and growth.... The result is that the malnourished child is also deprived of the stimulus and the interaction with the environment.... [T]here is increasing evidence that the lowered potential which results may be permanent. (p. 78)

Morley's concern with permanent damage here however expressed a categorically different concern from the lead posters produced for the campaign by UNICEF, which asked: "What would you like to be when you grow up?" with the answer—placed below an image of a nonwhite child—being "alive" (Figure 11 left). Morley's concerns perhaps

reflect a much longer history of concerns for child survival being infused with anxieties about the "quality" of the children surviving.

Having looked in this section at both before-and-after photographs and images of children being measured we can see that both forms of inscription have been used in a variety of ways to inspire conviction in a range of different audiences. In the case of before-and-after images what is "seen" and subsequently "believed" is time, specifically time marked by biomedical/humanitarian intervention. In contrast "measuring images" are used largely as "illustrations" to emphasize the invisibility of time and the need for expert visualization. However, in doing so they arguably come themselves to illustrate a range of temporal faults—from sluggishness to compromised national futures. Yet technologies such as the MUAC tape also raise interesting questions about the possibility for time to be conceived of, and reconstructed, more loosely.

The pictograms and the writing on the wall

Before tackling the modes of inscription that have come today to be associated with stunting, I want to briefly return to the quote by de Onis and Branca (2016) that "stunted children have stunted brains and live stunted lives" (p. 13). Following this quote is a description of stunting as a "hidden scourge" that frequently goes "unrecognised in communities where short stature is so common that it is considered normal" (de Onis & Branca, p. 12). Thus, what is normal by community standards becomes, when plotted against a statistically produced norm, abnormal. Yet this "new normal" (Sandler, 2021, p. 6), produced by the WHO 2006 child growth standards, was designed by the Multicentre Growth Reference Study (1997–2003) to be prescriptive rather than descriptive. It thus determined how all children—demarcated only by binary sex— *should* grow. Despite its universal claims, the study collected data from only six cities, involved approximately 8,500 children, and, although seeking out "healthy children living under conditions likely to favour the achievement of their full genetic growth potential" (WHO, 2006, p. xvii), nonetheless rejected 69–93% of this healthy population as ineligible to be included in the final study (Sandler, 2021, p. 6). Despite the tightly controlled nature of this sample, it remains the standard for measuring stunting today. It is thus the basis for the Global Nutrition Targets that propose a 40% reduction in the number of children under 5 who are stunted by 2025 and the Sustainable Development Goals that propose a 50% reduction in the same age group by 2030. Monitoring progress towards these goals, the Joint Child Malnutrition Estimates report from 2021 (UNICEF et al.) recorded that only one-quarter of countries are currently on track "to halve the number of children affected by stunting by 2030" (p. 2) with no data available for another quarter of countries. Stunting, although only one of three indicators of child malnutrition—alongside wasting (low weight-for-height) and overweight (high weight-for-height)—is at least three times more prevalent than the other two indicators and is the only one measured against the axis of time.

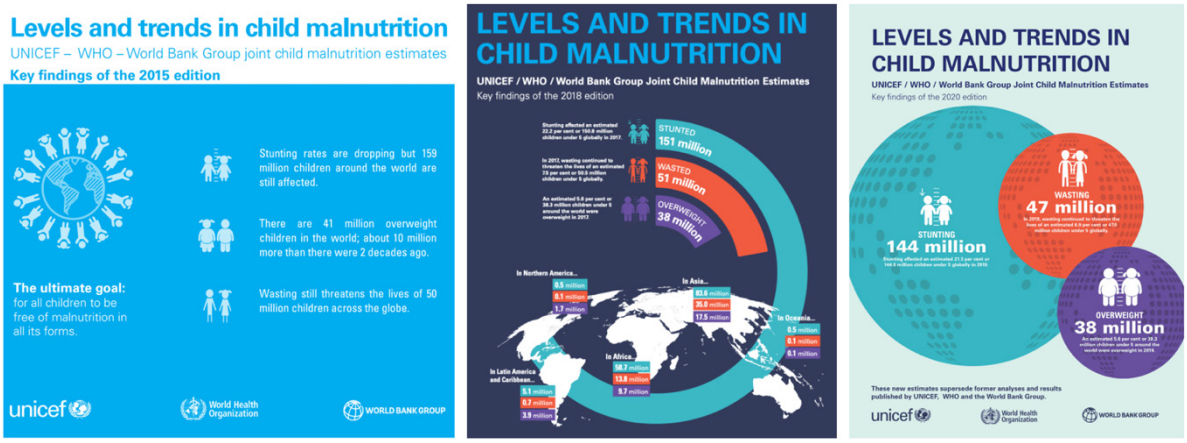

Figure 12. Infographics from UNICEF/WHO/World Bank: Levels and Trends in Child Malnutrition reports, 2015, 2018, 2020.

Each of these three indicators has, since 2015, been represented by a pictogram. This "standardization" of representation is a result of the formation of the Joint Malnutrition Estimates Working Group established in 2011 as an interagency collaboration between UNICEF, WHO, and the World Bank to "harmonize" child malnutrition estimates and benchmark global progress on child malnutrition. By 2015—marking broader shifts in modes of presenting information on global health—these reports had themselves become elaborate infographics. Functioning within these infographics to represent the three indicators are three pictogram-style images of two child figures (one with pigtails and a dress, the other without) standing in front of a series of parallel horizontal lines. While the wasting and overweight images feature figures with thin and wide bodies respectively, the image signifying stunting has a downwards pointing arrow two markers above the children's heads, perhaps signifying -2 standard deviations. These simplified pictograms both refer back to the long history of "measuring images" already discussed in this article, as well as indicating another novel inscriptive device that emerged several years prior to them, to which I will turn now.

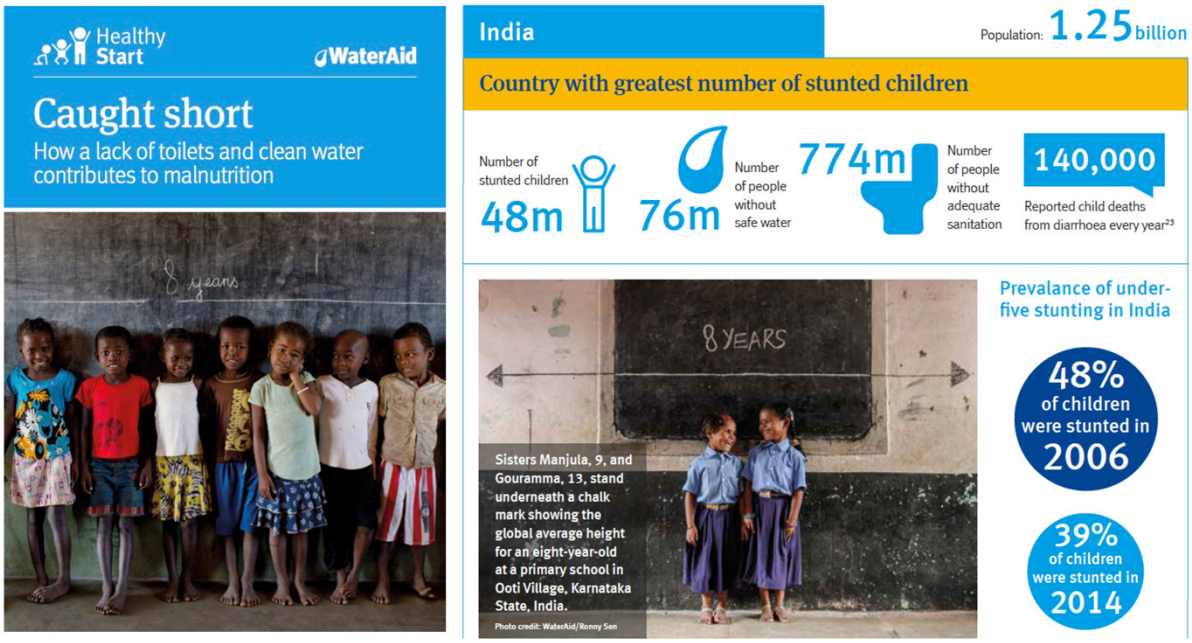

Figure 13. Cover and image from WaterAid publication Caught Short: How a Lack of Toilets and Clean Water Contributes to Malnutrition (2016).

The novel mode of inscription shown in Figures 13, 14, and 15 involves a group of children standing against a wall on which a line has been drawn marking "the global average height," the median, or the "minimal normal" of the children pictured. These images are reminiscent of a police lineup, with this carceral sense perhaps inadvertently exaggerated by WaterAid, who used one such image as the cover for their 2011 report *Caught Short* (Figure 13). Yet this insensitivity is not unique to WaterAid, as these images are frequently used in an array of publications and news articles with little thought for context: images of Guatemalan children are used to illustrate stunting in Malaysia, children from Tanzania to illustrate its effects in the Arab world. The earliest readily available example of this lineup-style image I have been able to find comes from a 2010 American Broadcasting Company (ABC) report entitled *Severe Stunting: Twelve Years Old Going On Five* that discussed malnutrition in Guatemala. This piece, whose title directly infantilized its child subjects, illustrated statistics like "50 percent of the population is stunted and, in rural Mayan villages, that figure gets as high as 80 percent" (Gowen & Marteli, 2010, para. 2) through a series of images that included two lineup-style photos that compared Guatemalan children living in Guatemala with those living in the USA (Figure 14). Citing unnamed medical anthropologists, the article nonetheless fails to capture the reality described by Emily Yates-Doerr (2020) that height, widely associated with "poor fitness," is, in Guatemala "used to further discriminate against Indigenous people, serving as a means of holding inequality in place" (p. 388).

Figure 14. Images from the ABC online report Severe Stunting: Twelve Years Old Going on Five, 14 December 2010. Left: 9-year-old children in Guatemala. Right: 9-year-olds from Lake Worth, Florida, of Guatemala-Mayan descent but born and raised in the United States.

Figure 15. Left: Image from Bill Gates' blog GatesNotes, with the caption "Why does hunger still exist in Africa?" August 1, 2014. Right: UNICEF Philippines, October 16, 2019: "Many children and adolescents in the Philippines are not growing up healthy."

A footnote to the ABC article offers further clues to the origins of these lineup-style photos, noting that the story was "supported in part by the Bill and Melinda Gates Foundation" (BMGF). As one of the key institutions of global health the BMGF contributes to the production of what Adams (2016) describes as "a form of global knowledge that is based on universals" where multiplicity is "visible only in and through global (that is, universal) forms of data production that get lumped together as metrics" (p. 6). Involved in all levels of metric production, promotion, and use, the BMGF has played a key role, not only in financially supporting nutritional interventions, such as the 1000 Days initiative, but also in funding the research that underpinned the Scaling Up Nutrition movement and, most notably, by financially supporting two *Lancet* series (2008, 2013) on maternal and child nutrition (see Sathyamala, 2017). Returning to the lineup image, it is perhaps then unsurprising to note that Bill Gates has also used this style of image in his blog *GatesNotes* (Figure 15 left).

The lineup image fulfills Bruno Latour's (1986) prediction of a "trend towards simpler and simpler inscriptions that mobilize larger and larger numbers of events in one spot" (p. 17). In fact, it is so simplified that by including only the median or average age line, it does not actually tell us whether these children are stunted according to WHO standards. Although perhaps indicated in the UNICEF image (Figure 15 right), in which the line is marked minimum normal, without any marker in the other photographs of where the -2 standard deviations line would be, we are simply left to observe the gap between the median line and the children's heads. Categorically this marking (or lack thereof) raises the question of whether these are actually images of children being measured at all. Likewise, the use of children aged 8 and 9 in many of these photos is disingenuous given that stunting as a metric is only recorded up to the age of 5. Furthermore, given the growing biomedical consensus that stunting is irreversible by age 2 (Pentecost, 2018) these children have all missed what Bill Gates describes in his blog as "the best down payment on their future" and what UNICEF Philippines calls "a window of golden opportunity." In this sense, although the UNICEF image more accurately presents younger children and uses a "minimal normal" line, the shorter children in this image remain outside the "golden window" that is by now firmly shut. Reading these images in the context of the articles in which they appear, the message is clear: These children are not only behind, but they will never be able to catch up.

Conclusion

To bring this article to a close I want to briefly comment on a series of Twitter advertisements (Figure 16) released

by the Danish multinational pharmaceutical company Novo Nordisk in 2021 to advertise their website More Than Height (https://morethanheight.com/en/). These advertisements, employing the metaphorical idiom of the elephant in the room, ask parents to address the issue of their children's height. The website puts it simply: "Your child's growth tells a story that is about more than just height, it's about their health and wellbeing." The reception to these advertisements on Twitter is interesting, not only because commenters highlight the clear conflict of interest behind this website—noting that Novo Nordisk sells products for "growth hormone disorders"—but also for the sheer vehemence with which commenters assert that they are more than their height. Describing family histories of short stature and detailing an array of long, healthy lives and impressive achievements, these commenters reject the suggestion that short stature requires medical intervention. Given the vehemence of these assertions, the relative silence of critical voices in the face of the dominance of child stunting discourses that condemn over a fifth of the world's under-fives to living "stunted lives" is deafening.

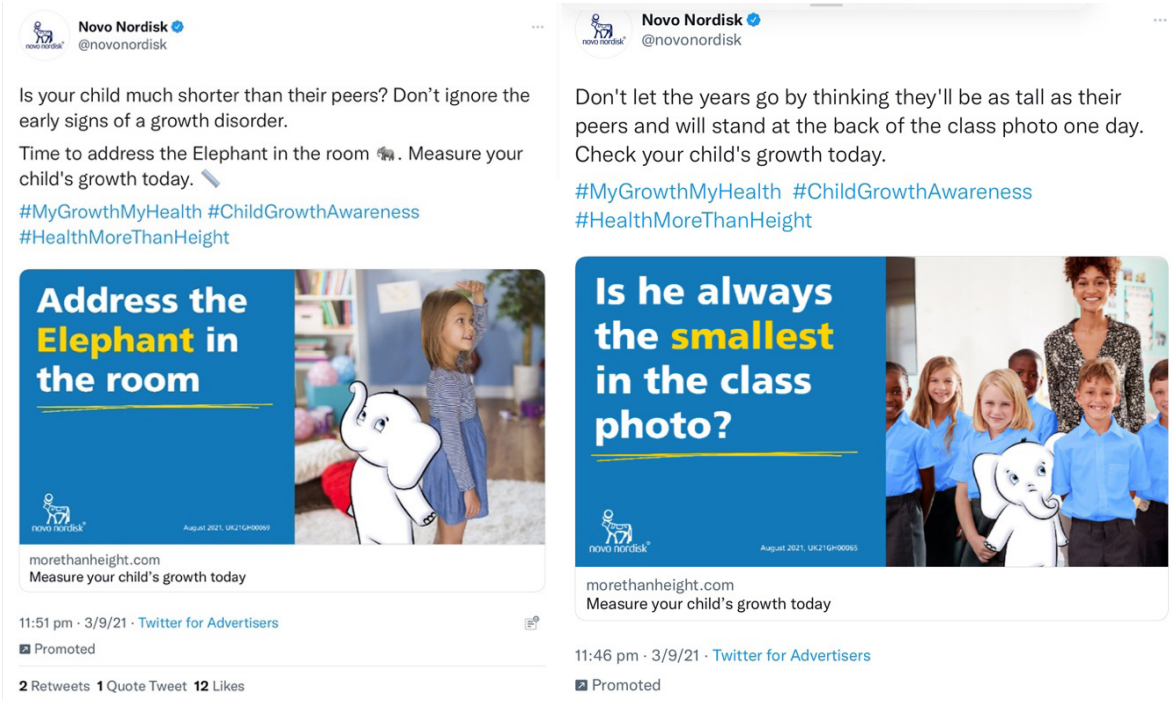

Figure 16. Twitter advertisements from Danish multinational pharmaceutical company Novo Nordisk, 3/9/21.

This paper has highlighted how particular forms of visualization—specifically before-and-after photographs and images of children being measured—enact and construct particular temporalities of growth for various audiences. To explore Latour's (1986) argument that "new inscriptions, and new ways of perceiving them, are the results of something deeper" (p. 7), this paper has looked to a range of historical materials to contextualize the contemporary emergence of lineup photographs and pictograms. Suggesting that the temporality of Quetelet's (1842) average man may be as unrealizable as his qualities, this paper has questioned the multiple ways time is constructed by inscriptive devices. Additionally, it has sought to highlight the ways these devices are then presented to audiences to inspire specific forms of belief and conviction: conviction in nutrition, conviction in development, and conviction in specific teleological models of growth and child maturation. That each of these "fields" reinscribes otherness and relegates those in the global South to a time behind those in the global North is evident. However, it is also perhaps in the very multiplicity of these modes of marking time that we may explore the possibility for time to be constructed differently. As medical anthropologist Emily Yates-Doerr (2020) argues, "seemingly tangible and fixed

measurement[s]" like height become "indeterminate when taken up in practice" (p. 387). Thus, it is from the field and the archive that new indeterminate modes of seeing and representing children's growth can be generated. With the archival examples I have shared in this paper I hope to have shown that new visions and modes of envisioning children's growth must be conceptualized globally—not in the globalizing sense of global health but by attending to the global distribution of time and potential in a range of inscription technologies. This conceptualization cannot, however, simply be a discursive challenge to the linguistic and representational practices of paradigms such as stunting, but must in turn produce new models of service provision that attend to children's needs without "fixing" them in time.

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