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Junk Science? Four Arguments Against the Radiological Age Assessment of Unaccompanied Minors Seeking Asylum

Gregor Noll*

Abstract

Should radiological age assessment at all be considered as a means to alleviate the doubts of a decision taker in the asylum procedure? In this text, I ask, first, whether the use of radiological imaging methods in the age assessment of unaccompanied adolescents seeking asylum are in compliance with internal norms of the forensic science community and find that they are not. Second, I consider whether their use is scientifically authoritative according to the current state of the art in forensic medicine and traumatology. I find that they are not. Third, I pursue they question whether their use is sufficiently safeguarded against a particular kind of communicative error between judges and experts. I conclude that they are not. In all, I show that properly understood advice from a forensic science expert who takes into account the scientific issues I enumerated in this article *can never dispel doubt on an applicant's age*. According to article 25.5 of the Recast Asylum Procedure Directive, this prevailing doubt will automatically trigger the assumption that the applicant is a child, which is my fourth and last argument.

1. Introduction

Asylum applications by adolescents might raise the question whether the applicant is a minor or not. Being a minor offers advantages in the asylum procedure, such as access to procedural benefits and safeguards, the exemption from removal to other EU Member States under the Dublin Regulation, and a much higher likelihood of being granted protection as an “unaccompanied minor”.¹ Host states are interested in limiting the group to which those benefits

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¹ Also, minors are entitled to residence permits to unite with family resident in the host country. Furthermore, special measures will be taken to accommodate the needs of unaccompanied minors, such as the identification of a custodian, matters regarding the accommodation of the child or access to family tracing. In a 2013 judgment (Case C-648/11. The Queen on the application of MA, BT, DA v Secretary of State for the Home Department) the Court of Justice of the EU has determined that unaccompanied children are to benefit from exemptions of responsibility allocation under the Dublin Regulation, which is now reflected in article 8.4 of the Regulation (Regulation No 604/2013 of the European Parliament and of the Council of 26 June 2013 establishing the criteria and mechanisms for determining the Member State responsible for examining an application for international protection lodged in one of the Member States by a third-country national or a stateless person). To assess that a child is under 14 years of age is also of importance, as this is the age limit for taking and searching for fingerprints according to article 9 EURODAC (Council Regulation No 603/2013 of the European Parliament and of the

apply so as to minimize costs and possibly to deter future asylum seekers. In cases where applicants arrive without documents, or hold documents deemed unreliable, there are no formal or historical sources that may alleviate or confirm this doubt. So decision takers speculate on what age the applicant's biological or intellectual development might indicate. When in doubt, decision takers, or, at times even the representative of the applicant, may resort to medical age assessments in such situations.²

The methods used and the medical sub-disciplines involved in medical age assessments vary. On one end of the spectrum, the applicant is presented to a paediatrician, who makes a comprehensive assessment on the basis of an individual anamnesis. Radiological examinations might form part of that anamnesis together with other forms of examination. At the other end of the spectrum, the applicant is merely x-rayed to produce images of body parts such as wisdom teeth, clavicle or wrist bones. A doctor specialized in radiology will then produce a statement on the basis of these x-ray images, featuring the statistical probabilities of a range of ages.

But should radiological age assessment at all be considered as a means to alleviate the doubts of a decision taker in the asylum procedure? In this text, I ask whether the use of radiological imaging methods in the age assessment of unaccompanied adolescents seeking asylum are a) in compliance with internal norms of the forensic science community b) scientifically authoritative according to the current state of the art in forensic medicine and traumatology and c) sufficiently safeguarded against a particular kind of communicative error. For each of these questions, my answer is 'no'. I present three separate but interrelated arguments in support for that conclusion. My fourth argument is that any doubt on the age of an applicant will necessarily persist after a radiological examination, which automatically triggers an *in dubio pro reo* rule in EU law, according to which the applicant has to be treated as a child.

Each of these four arguments is developed in its own section. Section 2 features the first argument on the grave consequences of deficient civil registration for forensic age assessments. In Section 3, recent developments in forensic science and traumatology take center ground. I propose that the authority of radiological age assessment practices for persons from states as Afghanistan and Somalia is called into question by a decade of findings in these disciplines. In section 4, I consider the communication between forensic expert and jurists and identify a pattern of fundamental misunderstanding, making up my third argument. To offer the reader a break from all the gloom, I show in Section 5 how legal representatives of unaccompanied adolescents seeking asylum can use these scientific doubts to trigger a favourable outcome for their adolescent clients under Article 25.5 of the EU Recast Procedures Directive. I conclude on the article in Section 6.

2. The Effects of Lacking Civil Registration on Radiological Age Assessment

Council of 26 June 2013 on the establishment of "Eurodac" for the comparison of fingerprints for the effective application of Regulation No 604/2013).

² Medical age assessment is not the only alternative. In some states other categories of professionals such as social workers are at times asked to act as experts on age.

Please consider the following assumptions:

1. Normally, every birth is reliably registered
2. Normally, it is not.

Some of us come from states with well-functioning civil registration systems. According to U.N. statistics, more than 90 per cent of European states have reported the total numbers of live births for at least one year in the period 2003-2007, based on complete civil registries.³ Some of us do not: the corresponding percentage for African countries is less than 10 per cent.⁴ For a European, it meets no difficulty to obtain a copy of her or his birth certificate to support an age claim before an authority. It is very likely that there is a civil registration system, and that personal information stored in it can be retrieved by an individual without undue difficulty. So, placing the burden of proof for age on a European claimant would not be unreasonable. Indeed, a Swede would probably be best placed to discharge the burden of proof on age in an asylum procedure. Yet it so happens that Sweden is not much of a source country for asylum seekers.

How about a person from Afghanistan or Somalia? In Afghanistan, the coverage of live birth reporting in 2003 was six per cent, according to a comprehensive dataset on worldwide civil registration provided by the U.N. Statistics Division.⁵ In Somalia, 3 per cent of all live births were registered in 2006.⁶ On the claim of being a minor, the burden of proof will partially or wholly be placed upon the applicant claiming to be a child.⁷ Is it reasonable to place the onus for providing information and carrying the risks associated to its correctness on Afghan and Somali citizens? Are they indeed best placed to carry the burden of proof for their age?

Might medical age assessments help here? Many assume radiological examinations of tooth mineralisation or the development of wrist bones or clavicles to be helpful. As they are based on something measurable, and a documented and standardized process of measuring, they possess an irresistible aura of objectivity and reliability. Sceptics tend to either focus on the sizeable average error estimates that are counted in years, not in months, or to point out that dental ageing does not capture exceptions from the norm.⁸ My first point is a different one. I have not seen it made in the legal and medical literatures on the issue yet. The standard objections against radiological age assessments of unaccompanied children are that they are unethical and “potentially

³ United Nations Statistics Division, ‘Availability of Vital Statistics’ (2010)
<http://unstats.un.org/unsd/demographic/CRVS/VS_availability.htm> accessed 22 Jan 2014

⁴ Ibid.

⁵ U.N. Statistics Division, ‘Coverage of civil registration system’ (2012)
<http://unstats.un.org/unsd/demographic/CRVS/CR_coverage.htm> accessed on 22 Jan 2014

⁶ Ibid.

⁷ Separated Children in Europe Programme, “Review of current laws, policies and practices relating to age assessment in sixteen European Countries”, *Thematic Group on Age Assessment* (May 2011), 4-5.

⁸ In *Y v Hillingdon*, Keith J noted the inaccuracy of dental ageing and the agreement amongst odontologists that dental ageing does not capture exceptions from the norm. *R (Y) v LB of Hillingdon* [2011] EWHC 1477 (Admin), para 28-32.

unlawful”.⁹ My objection here is that they lack a sufficient scientific base for the nationalities dominating amongst unaccompanied adolescents arriving in Europe. This is a free standing argument against their use. Yet it also supports other arguments against their ethicality and legality.

Simply put, here is what we do in a radiological age assessment: we compare a developmental feature of an individual of unknown age with the average developmental features of a reference group of individuals whose age is known.¹⁰

You see what I am trying to say. We will not be able to research Somali reference group composed of individuals whose age is known. Because births of Somali citizens were not registered to a sufficient degree, forensic researchers cannot know the age of the Somali reference group members they would like to be studying. And, as Schmeling and other forensic medicine researchers state in their 2006 article on age estimation in *Forensic Science International*, “[a] study that is to be used as a reference study in forensic practice must fulfil certain requirements”. One of the eight requirements is that “[t]he age indicated by the subjects should be verified.” They go on as follows:

‘As numerous studies originating from the African continent do not fulfil this requirement, they should be excluded from use in forensic practice.’¹¹

What does this all mean? If we exclude studies from Africa, we have no relevant reference group to compare our individual age-contested Somali asylum applicant to. Comparing her or him to non-African reference groups would counterfactually assume that our skeletons are developing identically across the world, differences in nutrition, health care, living standards and geographical-genetic pools notwithstanding.¹² If we would nonetheless perform such a comparison, it would be unscientific speculation. It would lack medical authority, and therewith the authoritative status accorded to expert evidence in legal proceedings. It is as simple as that.

Does this concern only Somalis, or only Africans? Not so. Afghans might be equally problematic.¹³ Wherever civil registration has been deficient, there is a double effect. Its deficiency strikes as much against the reliability of bureaucratic practice as that of medical science. This is because medical science is premised on the reliability of bureaucratic practice.

⁹ Ainsley Green, A et al “Medical, statistical, ethical and human rights considerations in the assessment of age in children and young people subject to immigration control” (2012) 102 *British Medical Bulletin* 17-42.

¹⁰ Or, as expressed by the Study Group on Forensic Age Diagnostics of the German Society of Legal Medicine in their 2008 ‘Criteria for age estimation in living individuals’: ‘The scientific basis of age estimation is the genetic control of ontogenesis, which delimits the temporal variation of developmental stages’ <http://agfad.unimuenster.de/german/empfehlungen/empfehlung_strafverfahren_eng.pdf> accessed 18 June 2014

¹¹ A. Schmeling et al. “Age estimation” (2007) 165 *Forensic Science International* 178-181, 180.

¹² See Section 3.b below.

¹³ See Section 3.b and, in particular, text accompanying n 18 below.

3. Current medical research indicates that radiological methods are less than useful

Is forensic medicine aware of its limitations in the area of radiological age assessments? To my knowledge, my argument that deficient civil registration produces deficient age assessments has not been presented in the discourse of that discipline before. But over the past decade, forensic medicine itself has produced research that seems to defy earlier assumptions on the reliability of its own age assessment practices. I suggest that our reading of this research be informed by the findings of traumatology, another medical sub-discipline. I conclude that both establish a second stream of arguments against the use of radiology in age assessment, independently of my argument on civil registration.

a. Variations due to ethnicity and socioeconomic status

Over the past decade, forensic research has come to reflect that populations against which the single migrant is compared might be significantly different from that to which the migrant belongs. With the 2004 study by Olze et al, it was established that ‘Mongoloids’, ‘Caucasians’ and ‘Africans’ deviate from each other in at least some developmental features.¹⁴ The importance of ‘the ethnic factor’, as the study cast it, was complemented by the insight that socioeconomic factors might cause significant developmental differences as well.¹⁵ The belief in a sufficient uniformity of human development to allow assessing any member of the human species along the same set of standards had been thoroughly rattled.

We find evidence of that rattling in the ‘Criteria’ suggested by the German Study Group.¹⁶ Here is an element of their advice on how expert reports on age assessments should be drawn up:

The age-relevant variations resulting from the application of the reference studies in an individual case such as deviating genetic/geographic origin, different socioeconomic status and with that a possibly different degree of acceleration, developmental disorders of the individual, have to be discussed in the report including their effect on the estimated age and, if possible, a quantitative assessment of any such effect should be given (...).¹⁷

The problem is, however, that *we do not know what these variations are*, because they cannot be researched for countries with deficient civil registration. The advice seems to suggest that genetic or socioeconomic variations can be factored into the

¹⁴ A Olze, A Schmeling, M Taniguchi, H Maeda, P van Niekerk, K-D Wernecke, G Geserick, ‘Forensic age estimation in living subjects: the ethnic factor in wisdom tooth mineralization’ (2004) 118 *Int J Legal Med* 170-173. It is generally accepted that terms as ‘Mongolians’ should not be used due to their derogatory nature. This terminology dates back to racial biology. I would think that its use in contemporary writings reminds us of the heritage from which forensic age assessment is unable to liberate itself.

¹⁵ One study quoted in the German Study Group’s ‘Criteria’ is R Cameriere, C Flores-Mir, F Mauricio, L Ferrante ‘Effects of nutrition on timing of mineralization in teeth in a Peruvian sample by the Cameriere and Demirjian methods’ (2007) 34 *Ann Hum Biol* 547-556.

¹⁶ A Green, above n 9.

¹⁷ Study Group, above n 10, 3

assessment of a proband from Afghanistan or Somalia. I cannot see how this would be possible in a scientifically acceptable way.

b. The absence of population-specific standards

The realization that variables matter has led forensic researchers to test the applicability of standard methods on non-Western populations. Here, I would like to highlight two articles suggesting that established forensic medicine standards on skeletal and tooth development suffer a massive loss of relevance in non-Western populations. Assessing a sample of 889 wrist scans at a Karachi hospital in their 2010 study, Zafar and others found against the applicability of the Greulich-Pyle atlas for accurate skeletal age assessment in Pakistani children.¹⁸ Might that not render Greulich-Pyle as useless for assessing age of persons originating from neighbouring Afghanistan?

On tooth development, the widely used Demirjian method¹⁹ has been called into question by a large number of studies, as it seems to rest on a false universal. A 2013 meta-analysis of 26 studies by Yan et al. states that 'Demirjian's method's overestimation of actual chronological tooth age reveals the need for population-specific standards to better estimate the rate of human dental maturation'.²⁰

However, a 2011 study by Pechnikova and others concludes that 'the three main methods for age estimation [Greulich-Pyle, Demirjian and Mincer] are still roughly useful for age assessment when racial information is not available'. The basis for this conclusion seems to be rather questionable, though.

The Greulich and Pyle method (...) showed that age was overall more frequently underestimated (in 46% of cases) than overestimated (in 37%); the agreement of estimated age (EA) and chronological age (CA) within 1 year was observed in 17% of cases.²¹

From this, the authors conclude that

In 17% of cases, estimated and chronological ages were concordant within 1 year, which shows the fairly good reliability of the atlas as a preliminary method in age assessment, regardless of ethnic origin, in comparison with dental methods.²²

¹⁸ Abdul Mueed Zafar et al. 'An appraisal of Greulich-Pyle Atlas for skeletal age assessment in Afghanistan' (2010) 60 *J Pak Med Assoc*, 552-555.

¹⁹ This method originates in A. Demirjian, et al. "A New System of Dental Age Assessment" (1973) 45 (2) *Human Biology*, 211. Basically, it maps the changes of calcium deposition in seven observed teeth, allowing inferences on the age of the proband. It remains part of standard procedure in dental age assessment.

²⁰ J Yan, X Lou, L Xie, D Yu, G Shen, et al., Assessment of Dental Age of Children Aged 3.5 to 16.9 Years Using Demirjian's Method: A Meta-Analysis Based on 26 Studies (2013), <PLoS ONE 8(12): e84672. doi:10.1371/journal.pone.0084672> accessed 11 Dec 2014.

²¹ M. Pechnikova, D. Gibelli, D. De Angelis, F. de Santis, C. Cattaneo "The 'blind age assessment': applicability of Greulich and Pyle, Demirjian and Mincer aging methods to a population of unknown ethnic origin" (2011) 116 *Radiol med*, 1105–1114, 1109.

²² *Supra*, 1112-1113.

If being best amongst the three standard methods means getting results within a one-year range of the actual age in merely 17 percent of all cases, this method is, frankly, useless for assessing whether adolescents seeking asylum are children.²³ To the degree this study is representative in its conclusions, it illustrates a profound misunderstanding on what the needs of the legal system are. With such weak arguments, Pechnikova and others involuntarily support the majority of studies arguing the need for population-specific standards in forensic age assessment.

c. The gap between forensic research and practice

What do the changes that the science of age assessment has undergone in the last decade mean for the practice of age assessment? My third point is that practitioners of age assessment encounter momentous difficulties in interpreting them. To sum up, practitioners largely rely on methods first developed in the 1930s and 1940s on relatively narrow Western populations. These methods now seem to be relativized by ethnic and socioeconomic factors, but nobody seems to have a scientifically based suggestion on exactly how to weigh in these factors. What is more, it remains very hard for practitioners to interpret the built-in methodological limitations of the reference studies they use under the constraints of temporal and institutional pressure.

We have one piece of evidence from the Austrian context on how a research study by forensic researchers Kellinghaus and others was used in one forensic practitioner's testimony to support a conclusion not mandated by it. In 2012, UNHCR RO Vienna asked Ivo Ponocny, an associate professor of applied statistics, and Elisabeth Ponocny-Seliger, an independent academic holding a PhD in empirical social research, to assess the use of a reference study by Kellinghaus and others in the Austrian asylum procedure.²⁴ When comparing an anonymized age assessment of an adolescent, they found that it referred to the study, used its criteria, but drew conclusions that were improper once the limitations of the study were considered.²⁵ It should give us pause that experts on applied statistics and empirical social research were needed to confirm the impropriety of that use.

Then again, the gap between scholarly insight and the work of practitioners is being addressed at least in one large jurisdiction. In a 2014 piece by Nowotny et al in *Deutsches Ärzteblatt*, the medical journal of the German-language M.D. community, radiological methods for age diagnostics were judged to be "obsolete".²⁶ The authors also stated that MRT scans should not be used due to their experimental character and

²³ In a 2003 article on the age assessment track record of the prestigious Institute of Legal Medicine at the Berlin Charité hospital, the authors proudly highlighted an average deviation of one year between assessed and real age of probands. The study concerned cases where assessed age could be verified ex post. Schmeling et al, "Statistical analysis and verification of forensic age estimation of living persons in the Institute of Legal Medicine of the Berlin University Hospital Charité" (2003) 5 *Legal Medicine*, 367-371. While a deviation of one year between assessed and real age might be less problematic in the determination of, say, pension age, I would think it to be completely unacceptable when removal to Kabul or Mogadishu is at stake.

²⁴ I Ponocny, E Ponocny-Seliger, 'Biometrische Stellungnahme zu den Referenzpublikationen von Kellinghaus et al (2010a, 2010b)', Vienna, 30 September 2013 (on file with the author).

²⁵ *Supra*, at 8.

²⁶ Nowotny et al. "Strittiges Alter – strittige Altersdiagnostik" (2014)18 *Deutsches Ärzteblatt* 786

the dangers of retraumatisation. Moreover, radiological methods and CT cause an indefensible level of radiation exposure without a justifying indication, they believe.

Within the profession, the climate might be changing. The 2010 Annual Assembly of the German Medical Association has stated that the involvement of medical practitioners with age assessment “should be rejected decisively”, referring to similar decision in 1995 and 2007.²⁷ The correspondent decision of 2014 phrased in even more aggressive terms.

The 117th Annual Assembly of the German Medical Association finds that the age assessment of unaccompanied minor refugees (...) by means of skeletal radiological examination or computer tomography is medically indefensible and must no longer be used for these purposes.²⁸

Scepticism by German practitioners might account for the fact that radiological assessments are hardly used by German courts. In a 2009 survey by the German government, merely two of sixteen German federal states drew on skeletal or tooth radiology when assessing the age of unaccompanied minors seeking asylum.²⁹ I would add, however, that the implication of anthropometric methods in National-Socialist race politics of the 1930s and 1940s is an additional factor. The German example must not be taken as representative of a European tendency, though.³⁰

d. Trauma and PTSD: a factor not yet accounted for

At this stage, I would like to bring in the literature on the impact of stress on physical maturity and development, which seems not to be taken into account by the forensic medicine of age assessment yet. It is well established by medical, and in particular traumatological research that stress may affect physiological growth and maturation in complex ways.³¹ PTSD in combat exposure leads to early physiological aging.³²

²⁷ See the decision of the 2010 Annual Assembly of the German Medical Association 21 May 2010, <<http://www.bundesaerztekammer.de/page.asp?his=0.2.23.8260.8265.8506.8510>> accessed 11 Dec 2014.

²⁸ German Medical Association, Altersfeststellung bei Flüchtlingen. Entschliessung. 117. Deutscher Ärztetag, Düsseldorf, 27.05 -30.05.2014, <<http://www.bundesaerztekammer.de/downloads/117DAETBeschlussprotokoll20140613.pdf>> accessed 11 Dec 2014 (author's translation).

²⁹ Antwort der Bundesregierung auf die Große Anfrage der Abgeordneten Josef Philip Winkler, Ekin Deligöz, Volker Beck (Köln), weiterer Abgeordneter und der Fraktion BÜNDNIS 90/ DIE GRÜNEN – Drucksache 16/10638 – Aufnahme unbegleitet einreisender Minderjähriger Deutscher Bundestag Drucksache 16/13166 16. Wahlperiode 27.05.2009

³⁰ A 2013 survey on age assessment by the EU's European Asylum Support Office shows a much more variegated picture suggesting that radiological assessments are still used by Austria, Belgium, Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Latvia, Italy, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Spain, Sweden, Switzerland. European Asylum Support Office, Age Assessment Practice in Europe (Publications Office of European Union 2014) 90-94, 89

³¹ “In conclusion, today, there is strong evidence that physical and emotional stress during critical periods of growth and development has permanent effects on body size and composition, tempo of growth and sexual maturation, metabolism, and behavior, resulting in adverse health outcomes in later life. However, although stress is often implicated in the pathogenesis of a host of diseases and, more specifically, the development of obesity and/or metabolic syndrome, type 2 diabetes mellitus, and cardiovascular disease, it is not easy to estimate its quantitative contribution at this time.” P. Pervanidou, G. Chrousos, “Metabolic consequences of stress during childhood and adolescence” (2012)

Maltreatment and abuse has been associated to the early onset of puberty, accounting for a difference of eight months in one particular study.³³ A 2013 study has shown that telomere variation of adult subject with partial or full PTSD exceeded the chronological age effects and was equivalent to an estimated five years in partial and ten years in full PTSD of premature aging.³⁴

What do we know of the prevalence of PTSD in asylum-seeking populations? A recent study by Bronstein and others shows that the estimated probability of PTSD in a population of Afghani unaccompanied minors in UK was 34 percent, significantly higher than in the average UK population.³⁵ It is safe to assume that the standard methods of age assessment are based on populations featuring a significantly lower probability of PTSD. As we saw, PTSD can cause premature aging to a significant degree, but this knowledge is simply ignored in radiological age assessment.

Reading the current results from epidemiology, psychiatry, traumatology and radiological paediatrics together requires a degree of interdisciplinarity that the ordinary radiologist writing expert statements arguably lacks. Stress is a factor separate from and additional to the known factors of ethnicity and socioeconomic status. We have no clear idea exactly how ethnicity and socioeconomic status should affect assessments under the standard methods of age assessment. Neither do we know how the degree of stress prevalence in a population affects it. And neither do we know how the three factors – ethnicity, socioeconomic status and stress – interact with each other, further destabilising any inferences we draw from the standard methods. While correlations between PTSD and premature aging are known to exist, their details are still to be researched, why they cannot be weighed in when assessing the age of undocumented children seeking asylum. Not weighing them in, however, as is done today, means to ignore an important body of scientific knowledge.

4. Does science provide the right answer to the wrong question?

What are the implications of deficient civil registration and the declining relevance of standard methods in radiological research for the legal professional using radiological age assessments? First, as suggested in section 3.c above, practitioners authoring expert statements for the use by courts do not necessarily understand how ethnic,

61 Metabolism Clinical and Experimental, 617.

³² “It is apparent from clinical experience and the literature that persons, who experience severe physical or mental trauma, are susceptible to premature aging (or psychological symptomatology). Z Solomon, A. Ohry, ‘*The Toll of War Captivity: Vulnerability, Resilience, and Premature Aging*’ in E. Martz (eds.), *Trauma Rehabilitation After War and Conflict* (Springer 2010), 361.

“Furthermore, empirical research established the association between war exposure and early physiological aging processes” Solomon and Ohry, supra, p. 406 with further references.

³³ P. Trickett et al. ‘Child Maltreatment and Adolescent Development’ (2011), 21 *Journal of Research on Adolescence* 3-20, 12.

³⁴ K-H Ladwig, AC Brockhaus, J Baumert, K Lukaschek, RT Emeny, et al., Posttraumatic Stress Disorder and Not Depression Is Associated with Shorter Leukocyte Telomere Length: Findings from 3,000 Participants in the Population-Based KORA F4 Study (2013).

<http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0064762> accessed 11 Dec 2014.

³⁵ “The estimated probability for PTSD in this UK sample of Afghan children was approximately 34%.” Bronstein et al, “PTSD in Asylum-Seeking Male Adolescents From Afghanistan” (2012) 25 *Journal of Traumatic Stress* 551–557, 554.

socioeconomic and stress deviations affect the validity of their findings. By consequence, their testimony tends to overstate the scientific validity of their own findings. Second, lawyers hardly understand the reservations that forensic experts *are* making on known limitations of their research. This is because lawyers quite simply are not trained in the methods of forensic medicine. Third, in order to be useful to lawyers, medical experts at times employ a juridical language that they do not fully understand.³⁶ The forensic expert understates her limitations, the judge disregards the reservations she nevertheless makes, and the expert's use of juridical language foreign to her makes it hard near impossible to reconstruct her assumptions.

As if this were not enough of a challenge, we are faced with yet another issue more fundamental in character. In the literature on the use of expert knowledge by judicial institutions, it is an established trope that experts might unwittingly answer a question different from the one that the judge has asked.³⁷ In short, the expert gives the correct answer, but to the wrong question. This phenomenon is known as 'error of the third kind' or 'Type III error'. Lena Wahlberg, a legal philosopher specialised on issues of law and medicine, has identified its consequences: the law is not applied in the way that it is intended to be applied, and neither does the law produce the effects it is thought and believed to have.³⁸ This error is perfidious because it easily remains undetected. To realize its existence, the judge needs to examine the degree to which the expert and the lawyer base themselves on the same epistemological and ontological assumptions, and whether differences are sufficiently grave to produce an error of the third kind. Judges might feel that they lack the competence to do this. They should be told that they are not alone. There is no profession that possesses the competency to translate between the different epistemologies and ontologies operating in different disciplines (as medicine and law).

I believe that radiological age assessments routinely answer a question different from the one that the lawyers are asking. Let us have a look what happens when a forensic expert is asked to provide expert knowledge on the age of an asylum seeker (which forensic medicine terms as a "proband", indicating that we deal with an evidentiary process according to the standards of forensic science).

Here is the question asked by the jurist: "How old is A?"

The answer delivered by the forensic expert could be this:
'Compared to existing image banks of dental and skeletal developments in researched populations, the images of the proband suggest that there is a 95 per cent likelihood that s/he is 18,2 years old.'

Why is this an answer to a question different from the one asked by the jurist? The jurist did *not* ask

³⁶ See the example of templates issued by three Swedish professional organisations at the end of this section.

³⁷ A standard reference is Mitroff, I.I. och Featheringham, T.R. 'On Systemic Problem Solving and the Error of the Third Kind' (1974), 19 Behavioral Science 383–393.

³⁸ Lena Wahlberg, 'Rätt svar på fel fråga. Typ III-fel vid användning av expertkunskap' (2009/10), *Juridisk tidskrift* 4, 889-900, 895.

‘What age would the proband be, if s/he had been part of the populations that previous medical studies had tested?’

Had she done so, the expert’s answer would have been adequate. And why is this exchange of question and answer treacherous? Either the lawyer will simply *not realize* that the populations earlier researched in forensic sciences are significantly different from the population the asylum seeker is part of. Or the lawyer may think that the forensic expert already considered these differences, and found them insignificant, while the forensic expert never intended to take a position on the significance of that difference. Put simply, the forensic expert merely said “if the asylum seeker is really comparable to the populations studied in the reference literature I use, it is most probable that she is over 18 years of age”. But the judge understands the expert to say “It is most probable that the asylum seeker is over 18 years of age”, omitting the reservation on comparability.

A close look at how expert statements on age are organized in Sweden would seem to confirm this. Three professional organizations have developed instructions and a template for age assessment in migration law contexts (the Swedish Paediatric Society, the Swedish Dentists’ Association and the Swedish Association for Paediatric Radiology).³⁹ The most extensive and complex instructions and template are those of the Swedish Paediatric Society. In the instructions, the difficulties and insecurities burdening the assessment of age of young persons are highlighted in various contexts. These instructions will be read by the paediatric performing the assessment, but hardly by the lawyer using the assessment in taking a decision.

What the jurist will read is the formal expert statement, based on the Society’s template. In its concluding section, it offers three choices. First, the expert may tick a box indicating that the findings “**show** that the age claimed by the examined him- or herself (... years) is probable”.⁴⁰ Second, there is a box indicating that the findings “**do not show** that the age claimed by the examined him- or herself (... years) is probable” In that case, the expert is to fill in a field for a “probable age”. Third, there is a box indicating that a “sufficient base is lacking for assessing whether the age claimed by the examined him- or herself (... years) is probable”.

Apart from the latter box signalling a non-liquet, the complexity of the instructions have been reduced to the binary of age either being probable or not being probable. To be sure, this binary is an import from Swedish migration law. The relevant standard of proof is that age must be “made probable” by the claimant if written documentation on age is absent. It seems that the Swedish Paediatric Society simply wanted to be useful for lawyers by adapting their terminology. And this kindness produces a problem. There are no agreed scientific thresholds for when a particular age is sufficiently probable to motivate it being labelled “probable” in the legal sense. In fact, the use of probability terminology in the sciences and in law respectively are what false friends are in learning a language. Identical on the surface, they conceal a wealth of different meanings.

³⁹ The Swedish-language originals of these templates are available at the website of the Swedish National Board of Health and Welfare at <http://www.socialstyrelsen.se/barnochfamilj/placeradebarnochunga/ensamkommande-barn-unga> accessed on 4 Jan 2015.

⁴⁰ Translation of all template quotes from Swedish by this author.

So what happens when a judge at the Migration Court reads the concluding section of a paediatric age assessment based on the template? She will find a straightforward verdict on probable age, ready-made for consumption in the legal procedure. Why on earth would the judge go back behind that age verdict? Why would she read the instructions with all their complications, or, indeed, the forensic-medical literature behind the instructions? With the case balances to be managed, there is no reason to problematize the knowledge that already seems to have been translated into the evidentiary terminology of the law. So, the template *actually already embeds* a type III error. The lawyer will read it as giving the answer to a legal question, unqualified by the instructions' recognition that forensic science is working with large insecurities and that its knowledge is incomplete in significant regards. Yet the medical expert will believe that the age assessment is an answer to a question qualified by these insecurities, and that the lawyer understands this.

5. Legal Effects of Continued Radiological Age Assessments under New EU Law

Now isn't all this too sad? Not if you happen to represent an unaccompanied adolescent whom you think should be treated as the child she is. In fact, all deficiencies of radiological age examination work to your client's advantage.

Let us imagine that a medical examination is ordered to alleviate doubts on the age of an applicant. Those doubts typically arise with applicants from countries lacking a reliable civil registration system (I named the most prominent ones: Afghanistan and Somalia). No medical age assessment of applicants from such states would be able to alleviate such doubts for the reasons I explained above. To the extent the forensic expert is fully committed to scientific methodology, he or she is likely to confirm that it would be scientifically improper to assess age of a person in the absence of a relevant reference group study. So any doubt that exists before the expert assing that applicant's age *will necessarily continue to exist* after proper forensic expertise has been obtained.

The persistence of doubt after a medical age assessment has legal consequences under EU law. The first paragraph of article 25.5 of the 2013 recast of the Procedures Directive (RAPD) reads:

Member States may use medical examinations to determine the age of unaccompanied minors within the framework of the examination of an application for international protection where, following general statements or other relevant indications, Member States have doubts concerning the applicant's age. *If, thereafter, Member States are still in doubt concerning the applicant's age, they shall assume that the applicant is a minor.*⁴¹

It all comes together here. Member State authorities that “use[d]” a medical age assessment “to determine the age of an unaccompanied minor” will necessarily *still*

⁴¹ Directive 2013/32/EU of the European Parliament and of the Council of 26 June on common procedures for granting and withdrawing international protection (recast) [2013] OJ L180/60 (hereafter RAPD). Deadline of transposition is 20 July 2015. My emphasis.

be in doubt as to the applicant's age after a radiological assessment. This is so because properly understood advice from a forensic science expert who takes into account the scientific issues I enumerated above *can never dispel doubt* unless it is deluded about the scientific preconditions of age assessment. This prevailing doubt will automatically trigger the assumption that the applicant is a child. The last sentence of article 25.5 RAPD says as much.⁴²

It is quite another matter that a medical examination is quite useless to the extent it relies predominantly on radiological methods. To insist that radiological examinations be carried out nonetheless would violate the minimization principle, that requires requires 'to perform each examination as dose-saving as possible and to dispense any exposition that is not mandatory'.⁴³ And it is quite another matter that an examination involving radiation that is ultimately meaningless cannot be considered the 'least invasive' type of examination prescribed by article 25.5 para 2 RAPD. I am satisfied that a Member State authority cognisant of the consequences of the first paragraph of article 25.5 RAPD will not be tempted to 'use' a radiological examination anyhow, as it defeats its own purpose.

6. Conclusion

In this text, I argue that the use of radiological imaging methods in the age assessment of unaccompanied adolescents seeking asylum is not in compliance with internal norms of the forensic science community. Neither is it scientifically authoritative according to the current state of the art in forensic medicine and traumatology. There are good reasons to assume that radiological expertise regularly produces a particular kind of communicative error in which the right answer is given to the wrong question. Any doubt on the age of an applicant will necessarily persist after a radiological examination. Under the *in dubio pro reo* rule of article 25.5 RAPD, a radiological examination will automatically entail that the applicant has to be treated as a child. For a state hosting doubts on the age of an applicant, the use of radiological expertise is self-defeating.

I conclude that the problem of radiological age assessment is really a problem of civil registration. The lack of reliable civil registration in important source countries for unaccompanied adolescents seeking asylum blocks the production of reliable ID documents needed for legal practice. What is more, it blocks the production of reliable reference studies in forensic medicine. Medical science is premised on the reliability of bureaucratic practice. Putting the burden of proof for age onto

⁴² The roots for the alleviating rule in article 25.5 RAPD can be trace to General Comment No. 6 by the Committee on the Rights of the Child. The Committee comments *inter alia* on the duties of state parties to identify children and suggests that

[s]uch identification measures include age assessment and should not only take into account the physical appearance of the individual, but also his or her psychological maturity. Moreover, the assessment must be conducted in a scientific, safe, child and gender-sensitive and fair manner, avoiding any risk of violation of the physical integrity of the child; giving due respect to human dignity; and, in the event of remaining uncertainty, should accord the individual the benefit of the doubt such that if there is a possibility that the individual is a child, she or he should be treated as such.

Committee on the Rights of the Child, General Comment No. 6 (2005), Treatment of Unaccompanied and Separated Children Outside Their Country of Origin, CRC/GC/2005/61 September 2005, para 31.

⁴³ Study Group on Forensic Age Diagnostics of the German Society of Legal Medicine, 'Criteria for age estimation in living individuals' (2008), above n 10, 3.

adolescents originating from such source countries is to treat them as if they had roughly the same evidentiary resources as European citizens. It is a case of treating unlike cases alike. To state it clearly: if Afghan and Somali adolescents, or any adolescent national of a country with weak civil registration are made to the burden of proof for their age, they are discriminated due to their nationality. Domestic and EU law apart, such discrimination is prohibited by the 1951 Refugee Convention as much as by international human rights law.⁴⁴

⁴⁴ Article 3 of the 1951 Convention Relating to the Status of Refugees (adopted 28 July 1951, entered into force 22 April 1954) 189 UNTS 137 (Refugee Convention) prohibits "discrimination as to ... country of origin". Convention for the Protection of Human Rights and Fundamental Freedoms (European Convention on Human Rights, as amended) (ECHR) art 3 prohibits discrimination inter alia on grounds of 'national origin' in securing the enjoyment of ECHR rights such as article 3 and article 13. International Covenant on Civil and Political Rights (adopted 16 December 1966, entered into force 23 March 1976) 99 UNTS 171 (ICCPR) Article 26 prohibits discrimination on grounds of national origin without being ancillary to other rights listed in the ICCPR. I could go on.