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A complete listing of his writings at <http://psychologywritings.synthasite.com/>.

1. HOME SCHOOLING

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1.1. THE DEBATE

Home-schooling (HS) has grown in popularity in the last fifty years in the USA, in particular, and estimates suggest around 1.7 million children (or 3% of the school-age population) in that country (Kunzman and Gaither 2020).

Lindsey Powell (Powell and Fields-Smith 2021) described herself as a "home-school graduate", who discovered at college that she had never met people with different views to herself. Along with social isolation, these were her arguments that home-schooling is socially harmful.

Cheryl Fields-Smith (Powell and Fields-Smith 2021) argued against this position, and pointed out the wide variety of experiences of HS, including organised groups of home-schoolers.

Powell raised the concern that HS allows child abuse to be hidden, while Fields-Smith described Black parents in the USA where HS is protest and resistance to racial marginalisation (Powell and Fields-Smith 2021).

1.2. DEFINING

Estimates of the number of children home-schooled depends on its definition, and Coleman and McCracken (2020) asked: "Is home-schooling defined by where it takes place? By who funds it? By who chooses or administers the curriculum? By who grades or gives feedback on student work? By which laws govern it?" (pp177-178).

There are a number of interested parties in this debate, including parents, teachers, advocacy groups, home-schooled students and alumni, researchers, law-makers, and education officials, "with the result that there are many conflicting definitions of home-schooling" (Coleman and McCracken 2020 p178).

The Department of Education in the USA, for example, used this definition: "Home-schooled students are school-age children who receive instruction at home instead of at a public or private school either all or most of the time" (quoted in Coleman and McCracken 2020).

Concentrating on the USA, Coleman and McCracken (2020) explored the definitions. For example, using the legal position, some states, like Texas, have no specific laws for home-schooling, but use private school laws. "If home-schooling were defined narrowly on purely statutory grounds, there would be no home-schooled students in the state of Texas" (Coleman and McCracken 2020 p178). But officially Texas reported over 350 000 children taught at home in 2020 (Coleman and McCracken 2020).

In other cases, students may enrol as satellite pupils of private schools to legally cover their home-schooling (eg: Alabama). These are sometimes called "umbrella" schools (Coleman and McCracken 2020).

Another variation is distance education (or correspondence or virtual/cyber schools) where pupils study at home, but the materials are provided by a specific organisation (eg: Christian Liberty Academy Satellite Schools; CLASS) (Coleman and McCracken 2020). This has been called a "boxed curriculum" (McKeon 2007 quoted in Coleman and McCracken 2020). It has been estimated that around 300 000 students were enrolled in virtual schools in 2017-18 in the USA (Coleman and McCracken 2020).

This is home-schooling by a definition based on where the education takes place, but not a definition based on parental responsible for curriculum, say (Coleman and McCracken 2020). Grady (2017 quoted in Coleman and McCracken 2020) observed that "whether or not parents of students in cyber schools define their child as home-schooled likely varies from family to family".

A further problem is whether the organisation/school receives public funding. "In 2003, a number of prominent home-school leaders ["We Stand for Home-Schooling"] drafted and signed a statement that explicitly excluded students at publicly-funded virtual schools from their movement" (Coleman and McCracken 2020 p182). This fits with the ideological position on home-schooling as independence from government control.

Concluding on the variety of definitions of home-schooling, Coleman and McCracken (2020) stated: "While the modern home-schooling movement may have begun as an act of political protest..., education outside of a traditional school has become simply one more option in

an increasingly diverse climate of school choice" (p197).

1.3. THE EVIDENCE

Kunzman and Gaither (2013) provided an overview of US research, and noted that "the great majority of home-schooling scholarship is qualitative, based upon small convenience samples. Home-schooling scholarship taken in the aggregate is thus little more than a series of anecdotes embellished by elegant methodology" (Kunzman and Gaither 2020 p254). These researchers also criticised "the advocacy disguised as "research" (p254) of many studies.

A further methodological issue is that school attendance is classed as a binary - either HS or not - with no controlling for years in conventional schooling or "flexi-schooled" children who combine both (estimated at half of HS children in one study) (Kunzman and Gaither 2020).

Kunzman and Gaither (2020) updated their previous review, and found another 519 academic tests published in the interim. There were over 2000 texts in total in the review. All texts were rated on three criteria - "quality of scholarship" (ie: methodological quality), "significance or influence" (whether the text was cited by others), and "distinctiveness" (new insights on the topic). Note that not all the texts were peer-reviewed.

Kunzman and Gaither (2020) identified a number of general categories of HS scholarship, of which much related to the USA.

1. Motivations of parents who are HS their children.

A traditional dichotomy was first noted in the 1980s of conservative Christians ("ideological motivation"), and "progressive, child-centred parents" ("paedagogical motivation"). "Despite the differences between these two groups, both tend to share certain assumptions, most notably a hermeneutic of suspicion toward government and professional expertise..., though there is some evidence that at least among some home-schoolers this attitude has moderated somewhat" (Kunzman and Gaither 2020 p261).

Research outside the USA found a third group of "pragmatists", who were HS because of the children's "unique educational or health needs".

The problem is that studies either end up with long

lists of motivations if parents are allowed to freely explain themselves, or 3 or 4 overall categories of motivation where parents have to choose from a list of options (Kunzman and Gaither 2020).

Kunzman and Gaither (2020) preferred to highlight that parents can change. For example, different approaches towards different children, "a gradual softening of ideology", or a hardening of attitudes. "Once the decision has been made, there is strong psychological pressure to self-justify. Mothers do not want to think that they might have made a bad decision, so they tend to describe their experiences in very positive terms to researchers and to come up with all sorts of post hoc motivations that might not have existed originally" (Kunzman and Gaither 2020 p263).

Research has also found contextual factors that are not explicitly articulated by parents, like negative experiences when children at school, or gender (eg: mothers "who do almost all of the actual home-schooling, are motivated more by their identity as mothers than by ideology... Fathers, on the other hand, while they do hardly any of the actual homeschooling, often speak in aggressively ideological terms about their family's commitment to the practice"; Kunzman and Gaither 2020 p263).

Neuman and Guterman (2019), based on open-ended interviews with 25 Israeli HS mothers, found four "super-themes" of motivation - "educational situation" (eg: unhappiness with conventional schooling), "deliberate change" (eg: ideology), "opportunity" (eg: special needs of child), and "flow". The latter "captures the insight that for many mothers, home-schooling was not a deliberate choice at all but emerged as a natural extension of and complement to other aspects of their family lives" (Kunzman and Gaither 2020 p264).

There may also be different motivations for minority groups (eg: Fields-Smith and Williams 2009; appendix 1A).

2. The organisation of HS.

A continuum from formal to informal organisation and curricula, but HS mothers may change their practice as they gain experience. Interestingly, "one of the most consistent findings of research on home-schooling practice, is that after a year or two of assiduous effort to mimic formal schooling at home, new home-schooling mothers gradually move toward a less-structured, more eclectic approach" (Kunzman and Gaither 2020 p266).

HS support groups or co-ops have grown up. "Mothers appreciate these co-ops, which typically are held weekly or bi-weekly, because they provide a structure for the rest of the week's schooling and assistance with subject matter in which the mother might not be expert, while children like them for the opportunities to socialize with other children and to study subjects they might struggle with in the nuclear family setting" (Kunzman and Gaither 2020 p267).

At the informal end of the continuum, a "hands off, child-centred approach" or "unschooling" can be controversial. "Outspoken advocates" emphasise its success, while "some scholars without a personal stake in the unschooling project have identified problems with the approach" [eg: underperformance of tests] (Kunzman and Gaither 2020 p269).

3. Academic achievement.

Making a definite statement on HS children's academic achievement compares to conventional schoolers is difficult because of design flaws with studies. For example, HS volunteers self-report their scores.

"One generalisation that emerges from many smaller studies on academic achievement is that home-schooling actually does not have that much of an effect on student achievement once family background variables are controlled" (Kunzman and Gaither 2020 p270).

There are a few good quality studies that match HS to institutionally schooled children, and give both both the same test in control conditions. Martin-Chang et al (2011), for example, found that "home-schoolers whose families use a more structured pedagogy outperform their demographic equivalents in public school, but those using a more unstructured or 'unschooling' approach underperform" (Kunzman and Gaither 2020 p275).

Generally, there are issues like the aspect of academic achievement being examined (eg: reading; mathematics), the age of the child, the ability of the child, and the educational level of the HS mother/teacher.

In the USA there is a lack of official data on the subject, and so researchers use different methods, including comparing self-selected home-schooled students' standardised test scores to national norms (McCracken and Coleman 2020) (appendix 1B).

Another method is to compare individuals at

college/university or in adult employment. Some studies find differences, some do not. The HS curricular experience appears important - for example, "home-schooled first-year college students often struggle more than their conventionally schooled peers with the task of writing research papers" (Kunzman and Gaither 2020 p274). Home-schoolers at college are not necessarily representative of all HS children.

4. Socialisation.

The "socialisation question" is often raised as the greatest concern of HS. Three major methodological limitations occur with research addressing this issue - self-reports by parents, treating HS and conventional schooling as either/or, and ignoring moderator variables.

Kunzman and Gaither (2020) focused on two aspects of socialisation:

a) Learning to interact with others - Bearing the aforementioned methodological limitations in mind, there seems to be little difference between HS and conventional schoolers. Finding appropriate measures of social interactions is also an issue (eg: social contacts; social skills).

b) The development of the child's own values - For example, there is concern that HS inhibits personal autonomy, or that exposure only to particular religious views, say, is limiting.

As previously mentioned, there are limitations with the studies, as well as great variety in the findings. Asking adult home-schooled children in retrospect is also not without problems as they may "not always [be] able to recognise the ways in which their supposed perceptions and choices were actually narrowly channelled by powerful parental influence. Self-deception or lack of awareness seems an unavoidable possibility with survey or interview research; to the extent that childhood memories and adult self-appraisal could be triangulated by other participant perspectives, a richer and more compelling picture of socialisation might emerge" (Kunzman and Gaither 2020 pp284-285).

5. Psychological and physical health.

There is concern that HS can hide child abuse. "As

part of their resistance to the broader surrounding culture, some home-school parents are particularly wary of government institutions and the notion of professional expertise... This includes not only public schools but other forms of child-related authority such as social workers and health care providers" [eg: less uptake of child vaccinations] (Kunzman and Gaither 2020 p285).

Commenting on this issue is limited "in part because comprehensive data are not available" (Kunzman and Gaither 2020 p287).

Drawing overall conclusions, Kunzman and Gaither (2020) observed that "governmental policy regarding home-schooling should be informed by careful, well-reasoned research. Yet home-schoolers are often urged by their fellow practitioners and movement leaders to avoid participating in research studies..., unless the study is sponsored by home-school advocacy groups themselves... Public dialogue and political decision making about home-schooling should not be guided by either advocacy-based research or isolated anecdotes, the latter of which tends toward the extremes of self-taught geniuses or children locked in cages" (p302). Thus, many questions about the "average home-schooler" remain unanswered (Kunzman and Gaither 2020).

1.4. APPENDIX 1A - FIELDS-SMITH AND WILLIAMS (2009)

Fields-Smith and Williams (2009) set out to rectify the fact that "the literature remains void of empirical work related to home education among African American families" (p369). They used qualitative methods with 24 Black families HS "within a south-eastern metropolitan area" in the USA. Data came from three sources (over two years):

- Surveys - general background information.
- Interviews - in-depth for 1-3 hours with mostly mothers.
- Focus groups - three sessions with 10-12 mothers.

Analysis of the data produced four themes related to the parents' motivations and experiences of HS:

i) The role of ethnicity - "Black families' perceived that institutional norms and structures within schools created destructive, rather than supportive, learning environments for children of African descent. In Psychology Miscellany No.153; September 2021; ISSN: 1754-2200; Kevin Brewer

turn, these perceptions prompted their decisions to educate children at home. Specifically, of the 24 Black home educators interviewed, 19 attributed their decisions to home school on perceptions of, or experiences with, inequities, prejudice, discrimination, or racism in public and private schools" (Fields-Smith and Williams 2009 p376).

For example, "Mr Richards" said: "In the back of my mind, I see our actions [decision to home school their son] as being racially motivated because of the history of Black males in the school system, especially the school system in this city. They have the lowest graduation rate for African American men, so I can't help but to think that that had something to do with it because the structure wasn't in place, whether it was because of resources, teaching - whatever it may be... I don't think they could deal with that type of personality and person. His learning style is not based on sitting down and being lectured to. He's more of - a lot of interaction, on-hands type, you know learning styles" (p376).

Similarly, "Mrs Johnston" stated: "Home schooling means we are free of the negativity associated with racism. In the school, children of colour tend to not be expected to excel. I think sometimes some negative behaviour, if it is handled correctly, can be diffused, but I think the school environment can go overboard making it more destructive. It's not a perfect world. I don't expect that, but I do take every advantage I enable my kids to grow up with a good sense of who they are in this world without people dumping on them" (p377).

ii) The role of religion - Twenty-one families referred to religious beliefs, but only six "directly shared a belief that God had actually led them to home schooling. For example, after attending a home schooling exposition at the invitation of a friend, Mrs. Brown reported that she and her husband, 'prayed about it and the Lord definitely said, I brought you home to do this', which Mrs. Brown interpreted as the Lord led her to leave her career in order to home school and raise her children" (Fields-Smith and Williams 2009 p379).

iii) Family sacrifices - eg: financial as two earners became one with the other parent (usually the mother) as the home-schooler. Fields-Smith and Williams (2009) observed: "Mothers' decisions to leave behind career, in one regard, became the abandonment of hopes and dreams of two generations. Further, from a woman's

right perspective, Black home educators' decisions to home school might appear to be an abandonment of the rewards obtained from a long struggle toward equality in the workplace. But for these Black home educators, the role of race justified the sacrifices made in order to secure a better future for their children" (p381).

iv) Challenges - four types:

- "Systemic issues" - struggles to gain access to services, like special education.
- "Lifestyle changes" - eg: from "career woman" to "HS mother".
- "Logistical issues" - eg: practicalities of HS, as one mother said: "the whole balance and dance with cooking, household management, being married, and then on top of that, home schooling the children" (p382).
- "Home educator praxis" - learning to be a teacher, and to instil a love of learning in the children.

Fields-Smith and Williams (2009) ended: "Though Black home school families are diverse demographically as well as in their approach to education, they are united in the belief 'that parents can and should be deeply involved in the education and development of their own children' (Lines 2001)" (p384).

1.5. APPENDIX 1B - ACADEMIC ACHIEVEMENT

The US State of Arkansas published test scores for all home-schooled children in its boundaries between 2003 and 2014. Overall, these pupils "tended to score around the 60th percentile on nationwide norms, with higher scores in reading and vocabulary and lower scores in spelling and math" (McCracken and Coleman 2020 p190).

Data are also available for Alaska's correspondence schools as the pupils are tested annually. Earlier small-scale studies have found that the students are above traditionally-educated peers in reading, for instance (eg: Folle 1986).

McCracken and Coleman (2020) analysed the publicly available data for 2002 to 2014 covering 38 correspondence schools and assessing reading, writing, and mathematics. Overall, no difference was found between

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the scores of correspondence and traditional schooled pupils.

But there were differences based on demographics - McCracken and Coleman (2020) explained: "correspondence students who are demographically privileged - those who are Caucasian, lack disabilities, and are economically stable - are underperforming with respect to their counterparts who attend traditional school. On the other hand, we found that Alaska correspondence students who lacked privilege in some way - in terms of race, socio-economic status, or disability - were better equipped than their counterparts in traditional school to succeed in reading and writing" (p210).

Usually in studies, demographically privileged pupils score higher on tests. McCracken and Coleman (2020) offered these possible explanations. Firstly, demographically privileged pupils may receive the benefits of traditional schooling (eg: teacher quality; school resources) disproportionately more, but with home-schooling, "they lose access to these achievement-boosting privileges" (McCracken and Coleman 2020 p211). On the other hand, disadvantaged children may "experience an academic benefit from the protection from negative school experiences that a non-traditional educational environment can offer" (McCracken and Coleman 2020 p211) (eg: bullying; stigma).

Other explanations include the parents' motivation and involvement in home-schooling, or that "disadvantaged children who enrol in Alaska correspondence schools may be a self-selected group who are demographically distinct from disadvantaged children who attend traditional schools" (McCracken and Coleman 2020 p212).

Across the board, McCracken and Coleman (2020) found that correspondence school students scored lower on mathematics than peers. Kunzman and Gaither (2020) speculated that "the conversational learning style common to home-schooling and the widely-observed phenomenon that home-schoolers often spend significant time being read to or reading all contribute to their impressive verbal scores, while math is not given the same priority" (quoted in McCracken and Coleman 2020). While Cannon and Ginsburg (2008) argued that home-schooled pupils' parents value mathematics less than language skills.

In terms of the data available, McCracken and Coleman (2020) noted that "correspondence students in every demographic category were significantly more likely than traditional students to opt out of or simply be

absent from the required state assessments" (p213). So, it was not known if the opt-outs were high or low achievers (McCracken and Coleman 2020).

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2. GIFTEDNESS

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2.1. INTRODUCTION

"Genius" is a commonly used term, probably over-used in everyday language. The idea being that there are certain individuals who are exceptional, and this is one way to identify genius - exceptional achievements (eg: in the arts or in science). But this can present genius as a discrete category. However, individuals can vary in terms of one exceptional achievement in a lifetime versus a lifetime of work. An IQ score above a certain levels feels more "scientific" (eg: >140) (Simonton 2019).

Terms like "gifted" or "talented" are used instead, particularly in relation to children. However, such terms are not without dispute. Subotnik et al (2019) were clear: "extraordinary abilities do exist and do matter" (pp66-67). They explained: "Giftedness implies an ability to perform at the extreme upper end of the distribution in a certain area" (Subotnik et al 2019 p67).

It is not the same as high IQ, though this can be informative, because "[T]o achieve greatness in any realm requires more than talent. It also demands extraordinary creativity, self-regulation and social skills" (Subotnik et al 2019 p67).

Studies have highlighted characteristics like independent thinking, commitment to goals/intrinsic motivation, and passion for a subject area as relevant (Subotnik et al 2019).

2.2. ISSUES

"In simple terms, gifted students are those who are exhibiting superior performance in a particular domain relative to peers" (Worrell et al 2019 p552). In the US public schools, for instance, around 6% of children were classified as gifted in 2012. But such figures only represent the children "classified", and there is an under-representation of certain ethnic groups, say

(Worrell et al 2019).

"Numerous models of giftedness have been formulated..., with no consensus on what the gifted label means" (Worrell et al 2019 p552). Sternberg and Davidson (1986), for example, outlined sixteen different conceptions of giftedness, though that is not exhaustive, and the popularity of different models varies between countries (Worrell et al 2019).

Worrell et al (2019) divided the models into three groups:

i) Models that focus on giftedness or ability - eg: high IQ or cognitive ability.

ii) Models that focus on the development of talent as it interacts with the environment - These models emphasise potential that needs to be developed, and recognise the importance of other factors, like motivation. For example, Tannenbaum's (1986) talent development model described the fulfilment of potential as due to factors like general ability, specific domain abilities, external support, and chance (Worrell et al 2019). Other models emphasise motivation in converting the potential into actual talent.

iii) Models that combine (i) and (ii) - These models tend to explain giftedness continuing into adulthood (Worrell et al 2019).

Worrell et al (2019) drew out the following points about the different models:

- High ability is a pre-requisite of giftedness (not necessarily the highest).
- Giftedness in childhood does not necessarily result in outstanding performance as an adult. This is an important issue as to whether the "gifted label" persists throughout the lifespan.
- The limited empirical support for many models.

2.2.1. How to identify gifted children?

In the USA, for example, the use of high test scores is common, or exceptional achievements (eg: in arts), or teacher recommendations. But a "major, ongoing issue

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within the field of gifted education is the under-representation of low-income and culturally and linguistically diverse students within gifted programmes" (Worrell et al 2019 p561).

This has led to the following methods to identify giftedness in all groups in society (Worrell et al 2019):

a) Universal screening - A standardised test taken by all children in the early years of schooling with a cut-off point for giftedness (eg: IQ of ≥ 130).

b) Do not use teacher recommendations - Leaving aside overt bias, teachers' beliefs about giftedness can influence the identification of talent. For example, Speirs Neimeister et al (2007) found that a majority of surveyed teachers believed that gifted students would be self-motivated and independent learners, "suggesting that they would miss children with potential who did not manifest such well-developed skill sets" (Worrell et al 2019 p563).

c) Allow for local protocols - eg: schools develop their own criteria, including local cut-offs rather than general ones. "Using local norms helps to identify children with the greatest potential within a school, who may benefit from a more rigorous, advanced curriculum than is currently available. These local norms also provide a more appropriate comparison group for assessing achievement, as students are compared to others who have had similar opportunities to learn" (Worrell et al 2019 p563).

d) Alternatives to traditional IQ tests, like the use of non-verbal tests or performance-based assessments.

2.2.2. Contentions

Worrell et al (2019) highlighted two key issues of contention:

A) Whether to have special programmes for gifted students, and the nature of such programmes.

B) The social and emotional functioning of gifted children - Chung (2017) summed up the concern: "It is increasingly recognised in the field of gifted education that giftedness is asynchronous development, which posits that the combination of advanced cognitive abilities and

heightened intensity and sensitivity in the gifted population creates inner experiences and awareness that are qualitatively different from the norm. The asynchronous development of the gifted renders them vulnerable particularly in the social-emotional aspects" (quoted in Worrell et al 2019).

There is limited research on the topic, but what studies that there are suggest that "gifted students, with tragic exceptions, are no more vulnerable than their non-gifted peers and are likely to become happier and healthier adults" (Worrell et al 2019 p568).

Worrell et al (2019) ended their review of the literature by outlining unresolved issues about giftedness:

i) Reconcile the multiple definitions and models of giftedness.

ii) Under-represented children classified as gifted (eg: low-income; ethnic minorities).

iii) The valuing of academic giftedness at the expense of non-academic abilities - "Talent development supports gifted youth in fulfilling their potential by evolving into creative producers or performers in adulthood. Given the association of gifted education with schooling, it can be argued that the domains of interest for talent development should be academic. However, many gifted youth, including those from under-represented populations, want to excel in areas such as professional sports or entertainment, domains that are not the primary focus of schooling and in which it is much more difficult to succeed professionally" (Worrell et al 2019 pp569-570).

iv) What is the end-point of talent fulfilment? eg: "eminence"; Subotnik et al 2011). On the other hand, "many worthwhile contributions are being made by individuals who are not eminent but who are giving back to society in less visible ways" (Worrell et al 2019 p570).

v) Should governments invest in talent development programmes?

vi) Helping children with the psychological challenge of giftedness - Feedback can be both positive and negative, and helping gifted individuals take

appropriate feedback to aid self improvement.

2.3. ABILITY GROUPING AND ACCELERATION

One way to help gifted children is "ability grouping", which small groups or classes of similar ability. Steenbergen-Hu et al (2016) noted four types:

i) Between-class ability grouping - Children of the same age placed in high, average or low classes.

ii) Within-class ability grouping - Sub-groups within a class.

iii) Cross-grade subject grouping - Grouping students for a particular subject based on ability, irrelevant of age.

iv) Special grouping for the gifted - Based on ability only, and age is ignored. This type also involves "acceleration", which "allows students to progress through school at a more rapid pace than their peers or to take courses at age younger than typical students" (Steenbergen-Hu et al 2016 p852). Other terms include "grade skipping" and "early entrance" (Steenbergen-Hu et al 2016) ^{1 2}.

An extreme example of acceleration (or "stunt"; Stanley 2000) was "when 75 students in the Study of Mathematically Precocious Youth ³ who had been identified as especially strong in math were taught a year's worth of algebra in a single day" (Steenbergen-Hu et al 2016).

Steenbergen-Hu et al (2016) reported a second order meta-analysis (ie: a meta-analysis of 13 meta-analyses) on ability grouping. Of the four types of grouping, only between-class grouping did not benefit the pupils, while pupils of all abilities improved significantly more than controls with the other three types.

Six meta-analyses on acceleration were found by Steenbergen-Hu et al (2016), and these showed that accelerated pupils outperformed non-accelerated same-age peers.

¹ Some critics see acceleration as bad for children - "that it will hurt them socially, push them out of childhood or create knowledge gaps" (Clyne 2019 p94).

² A halfway house could be access to challenging material/lessons of older children (Clyne 2019).

³ The Study of Mathematically Precocious Youth (SMPY) began in 1968 and has followed around 5000 individuals over their lives (Clynes 2019).

2.3.1. Accomplishments

Makel et al (2016) made clear their position on giftedness: "Extraordinary economies are created by extraordinary minds. More than ever, the strength of countries and their competitiveness depends on exceptional human capital... This leads to the question: Is it possible to identify those individuals who possess this exceptional human capital early in their lives so that their talents can be fostered for the good of society as well as their own?" (p1004).

For example, using SMPY data available for participants at 38 years old (Kell et al 2013), these individuals classed as the top 1 in 10 000 in mathematical and verbal reasoning ability at thirteen years old that "the magnitude of their creativity, occupational success, and professional stature was astonishing" (Makel et al 2016 p1004) (eg: 45% had PhDs; 15% had patents) ⁴.

Yet Makel et al (2016) recommended caution because "[T]hese results were based on one sample, and there are no studies in the literature to corroborate the findings. Consequently, replication is essential" (p1005). One such replication is Duke University's Talent Identification Programme (TIP) (Pullataz et al 2005), which began in 1981 searching for the top 0.01% of ability for an age group. Makel et al (2016) reported on 259 individuals now in their late 30s and early 40s.

Similar in methodology to Kell et al (2013), Makel et al (2016) searched the Internet for the TIP sample's educational degrees, occupations, and creative accomplishments.

The researchers described the life accomplishments of the TIP sample as extraordinary - eg: 9% had patents and 37% had PhDs. Markel et al (2016) explained: "Individuals, even profoundly gifted ones, primarily do what they are best at. Differences in ability patterns, like differences in interests, guide development along different paths, but ability level, coupled with commitment, determines whether and the extent to which noteworthy accomplishments are reached if opportunity presents itself" (p1004).

Lubinski et al (2014) provided more information about 1650 SMPY participants with an online survey in 2012-13. "Cohort 1" identified at thirteen years old in 1972-74 were now in their 50s, and "Cohort 2" from 1976-78 in their 40s.

⁴ About 2% of the US general population gain a doctorate (Lubinski et al 2014).
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Overall, [F]or both males and females, mathematical precocity early in life predicts later creative contributions and leadership in critical occupational roles" (Lubinski et al 2014 p2217). Around one-third had a PhD.

There were gender differences, particularly in income, with female participants earning less than their spouses. Lubinski et al (2014) described it thus: "although these mathematically talented males and females were married to highly educated spouses, the spouses of the males were more frequently financially 'underemployed'" (p2221). This difference may be explained by responses to items about life values: "Men as a group valued full-time work, making an impact, and earning a high income, whereas women as a group valued part-time work more often, as well as community and family involvement and time for close relationships" (Lubinski et al 2014 p2225). There were, however, not gender differences in the importance of improving the human condition, or living in an urban environment, for example.

This was the first study to show gender differences in life paths and accomplishments of highly gifted children (Lubinski et al 2014). This may be because the study was questionnaire-based, whereas the others mentioned above searched the Internet for publicly available information.

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3. EFFECTS OF INSTITUTIONALISATION AND DEINSTITUTIONALISATION

Many children in the world are raised in institutional care settings rather than in families, but what is the effect of such care on development?

"Institutions" here include orphanages, group homes, and children's villages. "The quality of such institutional facilities varies greatly. Key quality dimensions include the extent of the training staff receive, the rate of staff turnover, the child-to-caregiver ratio, the quality of food, and the standard of hygiene and health care, as well as factors that are essential for the provision of engaged and responsive carer behaviour. However, in institutions, care is typically provided by teams of poorly paid staff, who often have little training and have insufficient time to provide a basic standard of care to children. Peer and staff maltreatment of children might also occur" (Van IJzendoorn et al 2020 p704).

Van IJzendoorn et al (2020) considered two research questions in a systematic review:

i) Does growing up in an institution negatively impact physical, neural, cognitive, or socio-emotional development, or mental health ("institutionalisation"; IN)?

ii) If there is a negative impact, is developmental recovery or catch-up possible with family-based care ("deinstitutionalisation"; deIN)?

The researchers found 308 relevant studies.

Concerning the first research question, Van IJzendoorn et al (2020) made this point: "Randomly assigning children to either institutional care or to remain with their biological families is unethical. Consequently, research must rely on non-experimental or quasi-experimental observational designs. In these studies, institutional exposure might be confounded with pre-existing risk factors or child characteristics (eg: disability) linked to reasons for the initial entry into an institution" (p704). Notwithstanding this, the basic design of the study was to compare the development of children placed in institutions (for reasons other than disability or mental health problems) with family-based peers (either biological or adoptive), or with

standardised developmental norms.

Overall, institutional care was associated with developmental delays, but the size of the effect varied with the type of development. A longer delay in physical growth, brain development, and cognitive development, but smaller for physical health, and socio-emotional development.

Two methodological issues were raised by the researchers in reference to the socio-emotional development findings. Firstly, "in several studies the assessments were done many months to years after the children left the institution, potentially diluting the effects of institutionalisation with post-institutional experiences" (Van Iljzendoorn et al 2020 p710). Secondly, some variables were measured by parent or caregiver questionnaires not designed to assess "social deficits thought to be specific to children living in institutions" (Van Iljzendoorn et al 2020 p710). For example, the English and Romanian Adoptees (ERA) study used the term "deprivation-specific" (Rutter and Sonuga-Barke 2010) to describe "the unusual pattern of quasi-autism and disinhibited social engagement that was clinically distinctive and common in people who had had more than 6 months of severe global institutional deprivation, and was practically absent in people with deprivation lasting less than 6 months" (Van Iljzendoorn et al 2020 p710).

The second research question related to the benefits of deIN. Here there was a randomised controlled trial to support the observational studies - the Bucharest Early Intervention Project (BEIP) (Nelson et al 2014). This involved 136 children aged 6-31 months old in institutions in Romania, of which sixty-eight were placed in high-quality foster care, while the others remained in institutional care.

Deinstitutionalised children showed accelerated development in the observational studies, overall ("catch-up following deIN"). But the BEIP found less catch-up, and that "children in foster care rarely did as well as children who had never been institutionalised" (Van Iljzendoorn et al 2020 p712).

Van Iljzendoorn et al (2020) raised the concern that "correlational and natural experimental studies might overestimate effects because these studies do not control for baseline differences resulting from selective retainment of the most deprived children in institutional care. These overestimates are also possible if non-institutionalised control groups are not well matched for

ethnicity. For instance, institutionalised children are often adopted internationally and compared with individuals in the receiving countries" (pp712-713).

These are the general patterns, then, but "a child's response to institutionalisation and deinstitutionalisation will differ between individuals. Some children in institutions will have serious negative consequences in multiple domains, whereas other children might have negative consequences in only some domains, and other children might be largely unaffected. Likewise, some children will recover quickly after they leave an institution, whereas other children will have lasting harm" (Van Iljzendoorn et al 2020 p713).

Van Iljzendoorn et al (2020) outlined factors that might explain these differences in individual experience (and which studies in IN and deIN do not necessarily measure or control for).

1. Pre-IN context - eg: pre-natal (eg: maternal substance use) and post-natal events (eg: premature birth).

2. Institutional context

- i) Duration of institutional care - Van Iljzendoorn et al (2020) reported "a dose-response association, with longer stays in the institution predicting larger developmental delays and deviations" (p713). This was strongest for physical growth.

- ii) Age of IN - This covers the idea of sensitive and critical periods in development. The former is "a time in development when individuals are especially sensitive to adverse exposures in a way that increases the risk of negative outcomes. Such exposures might be necessary for an adverse outcome to occur, but they are not always sufficient (not everyone exposed is affected)" (Van Iljzendoorn et al 2020 p714). Critical periods are "times during development when exposure to specific experiences (or an absence of experiences) leads to inevitable and permanent negative outcomes. Such exposures might not be necessary for poor outcomes, but are sufficient (all children exposed will be affected)..." (Van Iljzendoorn et al 2020 p714).

For example, the ERA study (Kreppner et al 2007) found little negative impact on children spending their first six months in an orphanage compared to children who

spent up to 24 months institutionalised. It appears that the "age 6-24 months constitutes an especially sensitive period for the effects of institutional care" (Van Iljzendoorn et al 2020 p714).

The evidence favours the view that "the earlier in life children are removed from adverse caregiving environments, the more likely they are to recover and the fuller their recovery is likely to be" (Van Iljzendoorn et al 2020 pp714-715).

iii) Quality of institutional care - This is an important factor.

3. Post-IN influences

i) Receiving family resources - Access to resources (eg: family income; maternal education) can predict deIN success, particularly if the child has special needs.

ii) Quality of care - In the BEIP, specialist training for foster parents was provided.

iii) Individual differences in parenting - eg: control and discipline; parental sensitivity.

4. Child-related factors

i) Genetic factors - A small number of studies with small sample sizes have found some genetic differences in response to IN and deIN (Van Iljzendoorn et al 2020).

ii) Child characteristics.

Van Iljzendoorn et al (2020) concluded: "We found compelling evidence that institutional care is associated with negative developmental outcomes. The negative effects are greatest with regard to physical growth (including brain growth as indexed by head circumference) and cognition, and are strong in relation to attention problems (eg: attention-deficit hyperactivity disorder). Effects appear to vary as a function of the type of institutional care - ie: its duration and quality - with the suggestion that children aged 6-24 months are especially susceptible to the effects of institutional care. Although confounding risks and study artefacts cannot be definitively ruled out, the balance of probabilities favours a direct causal role for

institutionalisation in the reported adverse outcomes..." (p716).

They continued: "Evidence of catch-up or recovery following deinstitutionalisation has been shown, although many affected children do not show full catch-up, especially children with extended deprivation. For these individuals, even in supportive and well resourced foster care and adoptive homes, impairment can continue into adulthood. Despite this, many children who have left institutions adapt reasonably well" (Van IJzendoorn et al 2020 p717).

Bearing in mind the methodological weaknesses of the studies in their review, Van IJzendoorn et al (2020) felt that their evidence "underestimates rather than overestimates the effect of institutionalisation and deinstitutionalisation on children's development" (p717).

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4. CHILDREN AND CREATIVITY

Divergent thinking (DT) involves creative and innovative ideas as opposed to convergent thinking that focuses on a right or wrong answer. DT is tested in adults and older children with "novel idea generation" tasks like, "how many uses can you find for a brick?". How to test younger children?

Work by Elena Hoicka has developed a non-verbal test of DT for children as young as one year-old called the "Unusual Box Test" (UBT). The UBT is a toy box with unique features like rings, holes, and strings, and the ways in which the child interacts with it are scored for novel idea generation (May 2019) ⁵.

Bijvoet-van den Berg and Hoicka (2014) presented young children with the UBT and scored the interactions on a scale up to 28 (table 4.1). There were individual differences in the scores, which were consistent when the children were tested again two weeks later. The second time only new interactions with the UBT were coded to avoid "memory for (and repetition of) previous interactions" (May 2019 p80).

- 29 one year-olds and their parents were recruited in the UK. The children were presented with the UBT on two occasions, two weeks apart. Parents were instructed not to show or tell the child anything to do with the UBT, but the experimenter explained the different features before the children played with it.
- The children were video-recorded from two angles, and their actions (eg: hit; squeeze) and the part of the box touched (eg: rings; edge of box) were scored in five 90-second sessions. "For an action to count as a different action, it needed to either take place on a different box area, be a different action type, or both. If the child performed the same action in the same place, it was not coded again" (Bijvoet-van den Berg and Hoicka 2014 draft p8).
- "This study shows, for the first time, that DT processes may exist, and appear to be measurable, in the second year. It thus provides the earliest window to date to examine how DT emerges" (Bijvoet-van den Berg and Hoicka 2014 draft p12).

Table 4.1 - More details of Bijvoet-van den Berg and Hoicka (2014).

⁵ Example at <https://blogs.staffs.ac.uk/childrenslab/assessing-creativity/>.

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5. CLASSIC RESEARCH: GOLDFIELD AND REZNICK (1990)

Background - In the second half of the child's second year, there is a rapid increase in number of words used (vocabulary). This has been called the "vocabulary spurt" (Goldfield and Reznick 1990).

Aim - To examine the change in vocabulary in the second year of life.

Design - Longitudinal (lasting eight months) ⁶.

Participants - Eighteen middle-class White English-speaking US children whose mothers kept a diary of the words used by their offspring ^{7 8}.

Procedure - Beginning at age 1 year 2 months old, the mothers were interviewed by telephone every 2-3 weeks until the children were 1 year 10 months old. The mothers visited the researchers' laboratory every two months, and the children were tested.

Outcome measure - A "spurt" was defined as ten or more words used spontaneously on at least two different occasions by the child.

Findings - Two different patterns of vocabulary growth were observed in the data:

i) "Vocabulary spurt" - Thirteen children showed a three-month period of rapid word growth. Goldfield and Reznick (1990) preferred to call this a "naming explosion" because most of the new words were nouns (ie: names for objects).

ii) "Gradual increase" - Five children showed a gradual increase in vocabulary "with occasional spurt intervals alternating with intervals of slower growth" (Goldfield and Reznick 1990 p177). These children added nouns and other words (eg: verbs, pronouns) equally.

Conclusion - Not all children experience a prolonged

⁶ A longitudinal study is the best way to follow a change in behaviour. It can be described as a film, whereas a cross-sectional design is a photograph at one point in time.

⁷ Small homogeneous volunteer sample.

⁸ The researchers were dependent on the accuracy of the mothers' record-keeping and recall. An attempt at triangulation was made by testing the children in the laboratory intermittently.

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"vocabulary spurt".

Subsequent Research - Ganger and Brent (2004) re-analysed the data. They were critical of the definition of a "vocabulary spurt", and the length of the studies on this topic. Depending on these two factors, child will be categorised as having a spurt or not.

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