Neglected by Assessment:

Industry versus Inferiority in the Competition for Scarce Kidneys

Submitted by

Lonny Douglas Meinecke

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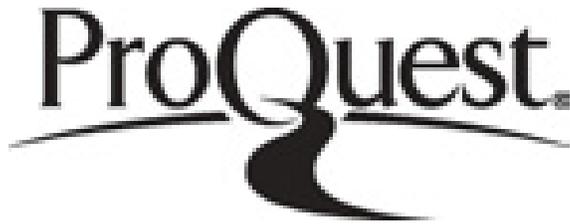
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Abstract

All individuals with end stage renal disease (ESRD) will perish from the disease unless they receive a donor kidney in time. The purpose of this research was to compare groups of candidates on the kidney transplant waiting list in the U.S. Renal Data System, to test whether some groups waited longer to receive a kidney due to a physical or mental assessment bias. A review of the literature suggested that most who perished prematurely also waited the longest and thus perished by neglect, fitting a theoretical framework called the stereotype content model (prejudice based on value to society). A causal-comparative study was conducted to examine the wait times of kidney candidates on the official waiting list categorized as too young or too old (n = 17,914). The results of one-way ANOVA, Welch's $F(2, 494.46) = 113.71$, $p < .0005$, $\omega^2 = 0.13$, suggested that the most mentally fit (not physically fit) children had significantly lower wait times ($M = 250.02$, $SD = 296.33$) despite not having contributed, whereas seniors had the longest wait times ($M = 786.27$, $SD = 717.51$) despite having contributed a lifetime to society. Further analysis revealed that, all else considered, primarily those assessed as mentally capable will be selected to survive ESRD, Welch's $F(3, 819.03) = 53.97$, $p < .0005$, $\omega^2 = 0.08$. This study concluded there was an inadvertent irony in candidate assessment criteria. The need to ethically allocate scarce organs has resulted in criteria that favor the survival of human kidneys over human candidates.

Keywords: end stage renal disease, ageism, ableism, industry versus inferiority, natural justice

Dedication

For those that honor me I will honor, and those that neglect me shall be neglected

I Samuel 2:30, King James Version, paraphrased

Since you didn't do it for one of the least important of these, you didn't do it for me

Matthew 25:45, International Standard Version

This study is dedicated to my late nephew, Ssgt. Rex Nathaniel Watt, who taught me to always have faith in our work, even if we sometimes lack faith in ourselves. Without you, Nathan, I would not have made it this far. You taught me to have faith. We miss you so much. Semper fidelis Nathan.

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Chapter 1: Introduction to the Study

Introduction

End stage renal disease (ESRD) is a terminal illness that results in physical and mental death (Center for Bioethics, 2004). Death is deferred by transplanting a healthy organ from another body into the unhealthy one. Unfortunately, since there are not enough kidneys to go around, individuals that need a kidney are placed on a waiting list and ranked by various physical and mental criteria. The length of time on the organ waiting list has been shown to be the key predictor of premature death from renal disease (Center for Bioethics, 2004; Patzer, 2011). The average wait time for a kidney has been about five years (10 in many states), but the average survival while on kidney dialysis is less than 5 years, so that any delay can mean premature death (Grubbs et al., 2014).

Despite this fact about the waiting list, the wait time for a transplant has demonstrated fitness bias. This fitness bias has been shown against groups such as the physically old (a prejudice called *ageism*) and the intellectually disabled (a prejudice called *ableism*). The longer wait times experienced by these groups indirectly condemns them to premature death from end stage renal disease (Curtis, 2006; Derrington, Goldberg, & Frader, 2016; Grams et al., 2012; Wightman et al., 2014).

Research suggested that this might be more than just a practical need to favor mental fitness and physical youth to better host the terribly scarce supply of donor kidneys. It suggested an inadvertent violation of international human rights in the difficult (sometimes painful) process of the selection of candidates, and the (often poignant) process of allocating a supply of scarce kidneys to an overwhelming demand by needy persons (Danovitch, 2014; Grams et al., 2012; Wightman et al., 2014; Ubel &

Loewenstein, 1996). Although these practical assessment biases had been studied, a survey of the literature suggested that some groups waited longer to receive a kidney due to a physical or mental assessment bias—possibly because when the need to choose becomes difficult, someone has to wait longer (Stone, Crooks, & Owen, 2013). Two such groups were the older renal candidates (still mentally fit but no longer physically fit) and the younger renal candidates (still physically fit but unlikely to become mentally fit; Grams et al., 2012; Kivnick & Wells, 2014). The researcher hypothesized that an analysis of existing data in the U.S. Renal Data System would allow a comparison of these disfavored groups, and perhaps help detect biases in the evaluation criteria (such as physical age bias or mental age bias). Such an analysis could compare the mean wait times of candidates for a kidney transplant for significant differences based on physical and mental fitness (Grams et al., 2012). Longer wait times for some individuals might suggest that society felt they were less competent and, as a consequence, felt less warmly toward them—which would correspond well to Fiske's stereotype content model (*competence versus warmth*), Erikson's psychosocial stages (*industry versus inferiority*), and Marcia's identity status model (*identity crises*; Kivnick & Wells, 2014; Stone et al., 2013). The results of that analysis might point to mental favoritism and inadvertent violations of the Universal Declaration of Human Rights by the overburdened industries of organ allocation and candidate assessment, while paradoxically doing their best to ethically decide which candidates should receive scarce kidneys (United Nations, 1948).

The succeeding sections of this first chapter examine the background of the problem and the purpose of examining it. Three research questions help analyze the differences between groups of candidates, and additional sections describe how this

research is significant and will advance scientific knowledge. The research design, terminology, rationale, assumptions, limitations, and delimitations are also outlined, followed by a summary of this chapter. The purpose of this research was to ask whether certain less desirable groups were being neglected by assessment and thus delayed long enough that survival as part of the overarching group was not possible (Roussos & Dunham, 2016).

Background of the Study

End stage renal disease (ESRD) is a serious physical condition the outcome of which is always loss of life (Patzer, 2011). Although medical science can delay death from ESRD, many perish while waiting for a kidney replacement, which is the only known temporary cure. The problem is that there are far more persons who need an organ than available organs, creating an ethical dilemma as to whom will be selected to survive (Patzer, 2011). Inevitably, those who are denied or delayed an organ will feel unequally treated by society and agitate for equality (Fyson & Cromby, 2013; Ubel & Loewenstein, 1996).

Research has been conducted demonstrating bias during assessment against older candidates, because of stereotypes of physical unfitness despite mental fitness (Curtis, 2006; Grams et al., 2012). Research has also been conducted demonstrating bias during assessment against younger candidates, because of stereotypes of mental unfitness despite physical fitness (Derrington et al., 2016; Wightman et al., 2014). A survey of the literature suggested that some groups such as older candidates (those who might be physically unfit but remain mentally fit) and younger candidates (those who might be mentally unfit but remain physically fit), ended up waiting longer to receive a kidney

because both were outside what was considered the ideal age group. The "just right"

group appeared to be the mentally unimpaired between 18 and 64 physical years of age

(please see Figure 2). This organ allocation crisis seemed intriguingly similar to

Erikson's psychosocial crisis stage called *industry versus inferiority* (i.e. usefulness to

society versus burden to society). The personal crisis described by Erikson also seemed to

be the professional crisis encountered during the practical selection of candidates for

scarce donor kidneys (Kivnick & Wells, 2014; Stone et al., 2013).

A visual of this concept, the intellectual stereotype model (ISM), is shown in

Figure 6 in Appendix H, using the primary theoretical framework of this research, the

stereotype content model from the Princeton social cognition lab (Fiske, 2013). A survey

of secondary data in the U.S. Renal Data System was undertaken to allow the comparison

of less favored groups by analyzing mean kidney transplant wait times, to test whether

some groups (such as the mentally impaired young or the physically impaired old) were

delayed a donor kidney due to a physical or mental assessment bias (Grams et al., 2012;

Kivnick & Wells, 2014; Stone et al., 2013). It was hypothesized that the results of such

an analysis might point to (inadvertent) violations of the Universal Declaration of Human

Right—while (paradoxically) trying to best uphold those values (Danovitch, 2014; Reese,

Boudville, & Garg, 2015; United Nations, 1948).

Problem Statement

It was not known if some groups such as older candidates (those who were

physically unfit but mentally fit) and younger candidates (those who were mentally unfit

but physically fit), waited longer to receive a kidney due to a physical or mental

assessment bias. This was an important research question because a survey of the

literature suggested that physical age and intellectual disability were being discriminated against during the assessment of renal transplant candidates and during the allocation of kidneys (Cherkassky, 2011; Derrington et al., 2016). The researcher believed that the delays experienced by the elderly (ageism) and by young people with special needs (ableism) represented the possibility that some candidates did not have an equal chance to survive end stage renal disease (Curtis, 2006; Derrington et al., 2016; Grams et al., 2012; Wightman et al., 2014).

The researcher believed the significance of this problem was that the current method of selecting and wait listing candidates—based on professionally fixed criteria like physical age and early intellectual assessment—might be an inadvertent violation of the Declaration of Human Rights. The primary affected population (including special needs youth and the elderly) did not seem to be granted the same chance for life as other groups (Danovitch, 2014; Reese et al., 2015). The researcher believed that this study might add to the literature with evidence of a delay of access to vital healthcare solutions, gradually targeting old age and delayed intellectual development.

Purpose of the Study

The purpose of this quantitative method with a causal-comparative design was to compare groups of candidates on the waiting list for a kidney transplant in the U.S. Renal Data System (USRDS), to test whether some groups such as older candidates (those who were physically unfit but mentally fit) and younger candidates (those who were mentally unfit but physically fit), waited longer to receive a kidney due to a physical or mental assessment bias. The data source was the Organ Procurement and Transplantation Network (OPTN) registration data publicly available from the USRDS, which is "a

national data system that collects, analyzes, and distributes information about chronic kidney disease (CKD) and end-stage renal disease (ESRD) in the United States" (U.S. Renal Data System, 2017, para. 1).

The independent variables for this study were: (a) physical age, representing the chronological age of a candidate regardless of greater overall ability than the chronological age suggests, and (b) mental age, representing the mental age of a candidate regardless of greater overall ability than the mental age suggests. Since chronological age is not typically a controllable or assessable quality, it was hypothesized that assessment bias based on the physical age of a candidate (regardless of being physically feeble or robust) could be detected. Since mental age (expected mental development relative to physical age) is not physically measurable the way chronological age is, mental age was hypothesized to provide a sufficient summary metric for potential bias during psychological assessment. The dependent variable for this study was transplant wait time, representing the length of time in days that a candidate with the specified criteria had waited to receive a kidney organ transplant. This variable was chosen because it was a metric in the U.S. Renal Data System which is always present and could be used to compare which candidates were prioritized for transplant.

This study followed similar ageism studies such as Grams et al. (2012). However, for the focus of this dissertation, the researcher divided physical age into three chronological age groups equivalent to prior Medicare physical age bias studies. These corresponded to: the group of normatively unemancipated youth under 18 (too young), the group of normatively retired seniors over 64 (too old), and the normatively productive age group between 18 and 64 (just right). This study also followed similar ableism

studies such as the detailed guidelines in Wightman et al. (2014), but simplified the categories to match this study. The researcher divided mental age into three levels of increasing intellectual ability, similar to prior intellectual development bias studies of the USRDS. These corresponded to: the group that is assessed in the system as incapable of self-care (too slow), the group that is capable of self-care but requires additional help (somewhat slow), and the group that is fully capable of self-care (just right). These were chosen because the capacity for self-care is a predictor of the ability to host a replacement organ and therefore a key criterion during candidate assessment. These distinctions accorded with existing categories in the USRDS and with detailed studies of special needs youth representation in the USRDS (Wightman et al., 2014). The group means for the wait times of each of these three age groups were then compared to test whether some candidates waited longer to receive a transplant due to a physical or mental assessment bias, meaning those groups were less likely to survive.

Research Questions and Hypotheses

The purpose of this quantitative method with a causal-comparative design was to compare groups of candidates on the waiting list for a kidney transplant in the U.S. Renal Data System (USRDS), to test whether some groups such as older candidates (those who were physically unfit but mentally fit) and younger candidates (those who were mentally unfit but physically fit), waited longer to receive a kidney due to a physical or mental assessment bias (Cherkassky, 2011). Three research questions helped explain existing differences between groups of candidates (Johnson, 2001). These three questions were operationalized in the following.

RQ1: Do candidates whose physical age is too young or too old have significantly longer transplant wait times compared to those who are just right?

H1$_0$: Candidates whose physical age is too young or too old do not have significantly longer transplant wait times compared to those who are just right.

H1$_A$: Candidates whose physical age is too young or too old do have significantly longer transplant wait times compared to those who are just right.

RQ2: Do candidates whose mental age is too slow or somewhat slow have significantly longer transplant wait times compared to those who are just right?

H2$_0$: Candidates whose mental age is too slow or somewhat slow do not have significantly longer transplant wait times compared to those who are just right.

H2$_A$: Candidates whose mental age is too slow or somewhat slow do have significantly longer transplant wait times compared to those who are just right.

RQ3: Do physical age and mental age interact to predict significantly longer transplant wait times?

H3$_0$: Physical age and mental age do not interact to predict significantly longer transplant wait times.

H3$_A$: Physical age and mental age do interact to predict significantly longer transplant wait times.

The variables for these research questions included two categorical independent variables (physical age and mental age) and one continuous dependent variable (transplant wait time). Physical age represented the chronological age of a candidate regardless of greater overall physical/mental ability than the chronological age suggested.

It was divided into three chronological age groups: the group of normatively

unemancipated youth under 18 (too young), the group of normatively retired seniors over

64 (too old), and the normatively productive age group between 18 and 64 (just right).

These categories allowed the comparison of physical age groups based on criteria that

seem to assess human physical age/ability according to a physical age bias. Mental age

represented the assessed mental age of a candidate regardless of greater overall

physical/mental ability than the mental age suggested. It was divided into three levels of

increasing intellectual ability equivalent to the ability for self-care: the group assessed as

incapable of self-care (too slow), the group assessed as capable of self-care but requiring

additional help (somewhat slow), and the group assessed as fully capable of self-care

(just right). These categories allowed the comparison of mental age groups based on

criteria that seem to assess human intellectual age/ability according to a mental age bias.

Transplant wait time represented the length of time in days that a candidate with the

specified criteria had waited on the waiting list to receive a kidney organ transplant. This

variable allowed direct comparison of the priority society places upon some individuals

over others, when all have equal need of scarce resources.

Advancing Scientific Knowledge

The literature on the psychological assessment of candidates for life-saving renal

transplants suggested potential bias for mental fitness (psychological robustness) over

physical fitness (biological robustness; Grams et al., 2012; Wightman et al., 2014).

Identification of mental favoritism during renal candidate assessment might advance

scientific knowledge by highlighting a paradox in the health industry's attempt to

ethically accomplish what might be an unethical thing—for example, an industry of the

harvesting and grafting of living organs between humans, to primarily extend the lives of those with measurably superior mental fitness. Such a practice could represent (inadvertent) violations of the Universal Declaration of Human Rights by the organ allocation and candidate assessment industries (the favoring of the most intellectually fit), which declaration at the close of global conflict sought to end such practices (United Nations, 1948). Authors studying what has been termed the *banality of evil* have discovered that intellectual fitness is correlated with competence, but intellectual fitness need not be accompanied by a sense of morality when it is applied (Newman, 2014). Some of the most infamous persons have had remarkably high IQs side-by-side with flattened socioemotional responses—just as Grandin highlighted about the sudden appearance of aberrational social behaviors in roosters, after fostering superior traits in farm animals raised for poultry (Brunner, 2001; Grandin & Johnson, 2005; Hough & Twemlow, 2017). Perhaps, this study could advance scientific knowledge by providing modest evidence that favoring the biological survival of those with the best intellect inadvertently fosters future banality toward biologically similar yet mentally inferior groups.

Previous models of prejudice (group bias) have described cognitive bias using human to human and human to animal relational models. Human to human prejudice has been empirically researched using the stereotype content model (Fiske & North, 2014). Human to animal prejudice has been empirically researched using the interspecies model of prejudice (Costello & Hodson, 2014). The model for this dissertation will help enhance current models of prejudice and the classes that prejudice describes, by proposing that group bias is also prevalent in mental to physical relationships. The

criteria used to assess and select candidates in the competition for scarce kidneys interestingly seems to exhibit a cognitive bias in favor of intellectually superior groups (Furnham, Richards, & Paulhus, 2013; Molony, 2016; Newlands, 2014).

Significance of the Study

The potential problem of bias against certain physical ages and certain intellectual and developmental disabilities (IDD) in the allocation of scarce kidneys was analyzed by comparing groups on the waiting list for a kidney transplant. Previous studies had shown organ assessment and allocation bias against physically aged candidates despite mental fitness (labeled ageism), and against physically young candidates with intellectual and developmental disability (IDD) despite physical fitness (labeled ableism; Curtis, 2006; Derrington et al., 2016; Grams et al., 2012; Wightman et al., 2014). The average wait time for a kidney has been about five years (10 in many states), but the average length of survival on dialysis is less than 5 years, so that any delay can mean premature death (Grubbs et al., 2014).

This study has advanced scientific knowledge in the subfield of psychological assessment by asking whether there is a significant assessment bias between groups on the kidney transplant waiting list, evident in the unusual delays some groups face while awaiting kidney transplant. The results of this analysis point to inadvertent (but possibly significant) violations of the Universal Declaration of Human Rights by the organ allocation and candidate assessment industries, despite obvious efforts to allocate scarce commodities ethically (Danovitch, 2014; Reese et al., 2015; United Nations, 1948). The significance was not whether some groups must be favored over others (because if the demand outweighs the supply, someone must be favored). The significance was a

paradoxical effort to ethically prioritize the right to continued life (via the assessment of individual value to society in the competition for scarce kidneys) when all human individuals regardless of condition needed access to this fundamental human right. This study has contributed the suggestion that a more ethical means to distribute lifesaving organs would not be to better industrialize their assessment and distribution, but to use a process of random selection which would guarantee the same chance to all human beings, since "All human beings are born free and equal in dignity and rights" (United Nations, 1948, para. 9).

These results might now empower currently disfavored (and often marginalized) groups, such as those with an intellectual or developmental disability (IDD) who are not yet emancipated from childhood status and thus unable to agitate for their equality. These results might argue for the right of all persons to a kidney transplant, by claiming a human right guaranteed by international convention since 1948, and on the basis of studies that show the post transplantation outcomes of the mentally impaired exhibit similar success to those without intellectual or developmental impairments (Wightman et al., 2014). These results suggest that a different form of assessment criteria should be used for persons aged 65 and over, since they are stereotyped as physically feeble and/or mentally feeble even when their physical and mental aspects exhibit robustness and their outcomes post transplantation are identical to younger candidates (Grams et al., 2012). As these individuals contributed a lifetime of service to society, it seems fitting not to delay or deny them the benefits of that society—similar to current issues about returning veterans and their access to vital healthcare. In the same way, if society denied the same rights to the same vital healthcare solutions because certain veterans did not meet certain

criteria when all had served in the same cause, this would not seem an ethical societal practice (Evans et al., 2015).

Rationale for Methodology

Qualitative or mixed methods would be appropriate if the purpose were to observe and explore populations under natural conditions or to illuminate the depth of differences between groups (Park & Park, 2016). Quantitative methods are more appropriate when the purpose is to predict, uncover, or control phenomena, for example to analyze measurements in numerical form taken from an existing population (Park & Park, 2016). Since the purpose of this research was to analyze measurements taken from an existing population (potential recipients of kidney organs), this study used a quantitative, causal-comparative design to gather and analyze the numerical data (Johnson, 2001). These measurements were queried from existing, secondary data sets which already contained the desired data, and in a form suitable for quantitative analysis but not randomly assignable to groups. Sociologically, this research pertained to the topics of prejudice and social justice, and an argument by researchers of social justice has been that, in comparison to qualitative methods, quantitative methods are used by and appreciated by the same established ingroups that outgroups seek equality from (Cokley & Awad, 2013).

Nature of the Research Design for the Study

This research used a causal-comparative (*ex post facto*) design because the data for this research consisted of secondary data in national repositories of organ transplant data which had already been collected (Johnson, 2001). As a result, the principal investigator could not manipulate the physical age and mental age conditions present in the fixed data. (Bleske-Rechek, Morrison, & Heidtke, 2015; Ejima et al., 2016).

However, as a similar research design had been used recently to analyze data such as the presence of mental illness in existing data, it was appropriate for this similar study also (Riemersma, van Santvoort, Janssens, Hosman, & van Doesum, 2015). This research study analyzed existing data as well, which included mental conditions along with physical conditions.

This research compared wait times for a kidney transplant, and tested whether some social groups were delayed a transplant due to a physical or mental assessment bias. The population consisted of human participants with end stage renal disease (ESRD) in need of a replacement kidney. The target population consisted of human participants on the kidney transplant waiting list. The sample consisted of human participants listed as active on the OPTN waiting list for kidney organ transplantation between January 1, 2014 to December 31, 2014 and included both first-time kidney transplant candidates and recipients[1]. These were grouped into three age groups (under 18, between 18 and 64, and 65 and over). These ranges were chosen to align this research with previous research in which physical age bias was found (Grams et al., 2012). The data were requested using the non-sensitive data request format at the USRDS, and participants cannot be identified from the data requested. All data were drawn directly from the OPTN portion of the USRDS, which is the only official repository of data kept regarding organ candidates, donors, and outcomes.

Definition of Terms

Ableism. Ableism is a form of prejudice and discrimination against the disabled who are often young and unable to work (typically this means intellectually and/or developmentally disabled with respect to resource allocation). This bias often leads to

denial of access to the same basic resources and the same fundamental rights as the general population (Long, 2015). This form of bias has been described as "policies that institutionally discriminate, mainly against children with rare impairments, leaving their families desperate and consigning them to a life of pain and inevitable premature death" (Long, 2015, pp. 1121-1122).

Ageism. Ageism is a form of prejudice and discrimination against the elderly, which often leads to restriction of access to resources. The resulting sense of being unwanted can lead to elderly health issues such as depression (Kim, Noh, & Chun, 2016). A link between ageism and mental health has been identified and studied.

Industry versus inferiority. Industry versus inferiority was one of Erikson's psychosocial crisis stages, in which the developing human encounters a crisis—either feeling needed by society (industrious), or feeling unneeded by society (inferior) like a living burden on others. "Industry" is a social attribution needed by the school-age youth of most cultures, marking a person's successful passage from being a potential burden to a potential contributor to society (Marcia, 2014). In return, the child acquires a sense of individual worth and social standing. Fiske (2013) operationalized this in the stereotype content model as social competence. Competence, in this model of social prejudice and the competition for group status, may then be traded for social warmth when the age of societally convened adulthood is finally reached (a period of the lifespan that Erikson aptly called the intimacy versus isolation crisis from ages 18 to 40).

Just before. This research study divided physical age and mental age into three groups each to allow comparisons and aid identification of the most favored group. After an analysis of the findings, it was discovered that the most favored physical and mental

age group for timely selection and receipt of scarce kidneys, was the age just before the just right group (a conditional group comprised of the best future qualities, not past or present qualities). Those in the just right age group were less likely to get a rare kidney because the group size was too large for individuals to stand out. Those in the too old age group were less likely to get a kidney because their abilities would never recover, and thus were less likely to contribute in the future. Those in the too young age group were likely to get a kidney, but if and only if they exhibited mental fitness. This group was labeled just before as a result of these findings. This group favoritism was also supported by a news item from the assessment and allocation industries in 2014, suggesting a new prioritization of youth, despite a growing elderly population that had already contributed to society, due to the practicality of favoring youth and fitness to host the longest survival of rare organs (Chopra & Sureshkumar, 2015).

     Mental age. Mental age is operationalized in this study as the relationship of mental development to chronological development regardless of greater or lesser overall ability or value. Mental age is the numerator of the Intelligence Quotient (IQ), which is the assessment of mental development relative to the norm for that chronological age. The young may be assessed as intellectually disabled or delayed based on culturally biased criteria (ableism and mental age bias), influencing the mental assessment of the potential for success of a young transplant candidate, and therefore a biased estimate of their future value as humans (Long, 2015).

     Mental age independent variable. The independent variable mental age was operationalized as the mentally assessed age of a candidate, regardless of greater overall physical/mental ability. Following previous studies but simplifying for this study, the

researcher divided mental age into three personal ability groups equivalent to similar studies but simplified for this dissertation (Wightman et al., 2014). These corresponded to: those incapable of self-care (too slow), those capable of self-care but needing assistance (somewhat slow), and those fully capable of self-care without assistance (just right). These distinctions accorded with existing categories in the USRDS database which could be readily sampled, and with detailed studies of special needs youth representation in the USRDS itself (Wightman et al., 2014). These categories allowed the comparison of mental age groups based on criteria that subdivide physical age into multiple cognitive/developmental age groups (incapable, semi-capable, or fully capable for their age).

Mental fitness. Mental fitness is defined in this dissertation as meeting psychosocial criteria deemed to be within the control of the human candidate. The use of validated instruments such as the Stanford Integrated Psychosocial Assessment for Transplant (SIPAT) and the Psychosocial Assessment of Candidates for Transplantation (PACT) evidences the professional separation of physical fitness criteria from mental fitness criteria, when making ever more difficult decisions regarding which human candidates should receive rare organs and survive (DiMartini, Crone, Fireman, & Dew, 2008).

Physical age. Physical age is operationalized in this study as the chronological age of a candidate regardless of a more robust ability than the age suggests. Research suggests that the burgeoning elderly age group continues to be assessed using culturally biased stereotypes. These attitudes perceive individuals in this age group as less physically or socially valuable than they are (ageism bias). These prejudicial attitudes

influence the physical assessment of a transplant candidate and may lead to delay or denial of a kidney followed by depression and death (Curtis, 2006).

Physical age independent variable. The independent variable physical age was operationalized as the chronological age of a candidate, regardless of the candidate's greater overall physical/mental ability. Following previous studies but simplifying for this study, the researcher divided physical age into three chronological age groups equivalent to prior Medicare physical age bias studies (Grams et al., 2012). These corresponded to: unemancipated youth under 18 (too young), persons between 18 and 64 (just right), and persons over 64 (too old). These categories allowed the comparison of physical age groups based on medical and psychological assessment criteria that also divide human chronological age in a similar way (not working yet, working, and no longer working).

Physical fitness. Physical fitness is defined in this dissertation as meeting the criteria for survival in physical terms. Biomedical factors (such as foreign tissue rejection) are physical factors. This is usually outside the manageability of the human candidate (Cherkassky, 2011).

Transplant wait time dependent variable. The dependent variable transplant wait time was a measured variable. It represented the length of time in days that a candidate with the specified criteria had waited on the waiting list to receive a kidney organ transplant. The kidney waiting list from which the data were collected recorded both the date candidate waiting began and the date of transplant (if any).

Assumptions, Limitations, Delimitations

This study assumed the secondary data source used was representative of the populations under study. As this repository is regulated by strict criteria and used to help document and make life and death decisions, this assumption should hold (U.S. Renal Data System, 2016). This study also had some limitations, along with its strengths. A limitation is something outside the control of a researcher which may have influenced interpretation of the findings (Velengtas, Mohr, & Messner, 2012). One limitation was that obtaining a representative sample was limited to the availability of the appropriate data in the secondary data source (the OPTN). As well, the independent variables were not within the control of the researcher (because the data already existed), and could only yield causal-comparative results (Johnson, 2001). In causal-comparative studies, causal inferences cannot be drawn and the results cannot be generalized to other populations because the physical age and mental age of the participants cannot be manipulated (Donofrio, Class, Lahey, & Larsson, 2014). Interpretation of the secondary data source without adjustments to the data might have exhibited modest differences from adjusted data in the annual reports (Grams et al., 2011; U.S. Renal Data System, 1992).

Another limitation, was that although the allocation industry seeks unbiased decisions, the possibility of cognitive bias in medical record tracking and decision making has been expressed (Molony, 2016). Observational biases during the discovery of causes, and during the formulation of prognoses, diagnoses, and administrative decisions were possible. However, as these same decisional biases were the subject of this research, this limitation may have helped to highlight the need for this study and may have strengthened rather than weakened its findings (Molony, 2016).

A limitation of note was a discrepancy between a larger number of recipients than candidates in the too young group data collected from the USRDS. This discrepancy may be explained in part by policy changes requiring the prioritization of scarce kidneys to the young (Chopra & Sureshkumar, 2015; Rodrigue, Schold, & Mandelbrot, 2013). It is possible that, given the new policy, persons under the age of 18 would not have been formally added to the list (there would have been no need to rank them or waitlist them if a kidney were available). As the annual reports include all cases of chronic kidney disease (CKD) and end stage renal disease (ESRD), this might have resulted in a discrepancy during data collection. Another limitation was the uncertainty of mental impairment data outside the youngest age group, and the subsequent decision to analyze the young and old separately given the uncertainty of comparing both groups directly. The resulting mean wait times, however, allowed the comparison of these groups after separate tests of each group had been conducted.

This study had some delimitations as well. A delimitation is a choice made by a researcher—for example something which was not done but which might have influenced interpretation because it was not done (Connelly, 2013). A delimitation was the choice of literature included to sufficiently represent the state of the research of the phenomena under study (assessment bias and class prejudice). However, the breadth of literature suggesting evidence of assessment bias might have made the study infeasible if fully included, much as a sample from a living population must be feasibly sized since interviewing the entire human population would not be feasible.

Summary and Organization of the Remainder of the Study

End stage renal disease is the last stage of an illness that results in death unless the individual receives a kidney transplant very soon (Patzer, 2011). Unfortunately, the need is much larger than the number of organs, so candidates must wait for one on a list. The waiting list ranks people according to criteria like physical age and intellectual ability, even though less than 35% survive more than four years without a timely transplant, while the average wait time for a transplant is five years (Center for Bioethics, 2004; Patzer, 2011). It was believed there were significant differences between the wait times of physical and mental age groups. This was important because any unusual delays experienced by the elderly (ageism) and by young people with special needs (ableism) would mean that certain groups of candidates on the waiting list did not have an equal chance to survive end stage renal disease (Curtis, 2006; Derrington et al., 2016; Grams et al., 2012; Wightman et al., 2014). The significance of this problem was that current assessment procedures might be an inadvertent violation of the Declaration of Human Rights which guarantees the rights and dignity of all persons, not certain physically and mentally fit persons (Danovitch, 2014; Reese et al., 2015; United Nations, 1948).

It was believed there might be a significant difference between the mean wait times of physical age groups and mental age groups as they awaited a kidney transplant. It was hypothesized that a quantitative method with a causal-comparative design could investigate these group differences by collecting and analyzing data from the USRDS waiting list (Johnson, 2001). This research advanced scientific research models of class prejudice with the inclusion of mental versus physical prejudice, and suggested that

current assessment procedures represent infringements of the human rights and dignity of protected groups, despite a well-meaning struggle to develop ethical criteria.

Chapter 2 explores the literature to date on the model, concepts and variables, methods, instruments and themes of this study, funneling the gaps in that literature toward the key hypotheses that argue for the premise of this research. Chapter 3 describes the methodology, design, population, sample, data collection, data analysis, and ethics proposed to test the hypotheses of this research. Taken together, these three chapters analyze the potential neglect of mentally and physically inferior groups during the process of the assessment of candidates for a kidney transplant. This research study conducts a comparison, asking whether those individuals who wait too long to survive have traits representative of inferior value in the competition for scarce kidneys.

Chapter 2: Literature Review

Of two evils choose neither. Don't choose the least, but let all evils alone.

Spurgeon, 2013, p. 341

Introduction to the Chapter and Background to the Problem

      Introduction to the chapter. The purpose of this chapter is to thoroughly present the background needed to understand the premise of this research. This chapter is divided into sections to make it easier to become acquainted with these underlying concepts. The main sections are (a) the background leading to this research, (b) the theoretical framework used to frame this research, (c) a review of relevant literature, (d) past methods leading to the method used in this research, and (e) past instruments leading to the data survey approach in this research.

      The survey of relevant literature is further divided into themes to make it easier to become acquainted with the literature underpinning this research. These themes are: (a) the problem (organ allocation), (b) the prejudice (physical/mental age), (c) the past (candidate assessment), and (d) the premise itself (assessment bias). Briefly, the problem is that the ethical allocation of sparse organs seems insoluble. This theme is about the paradoxical need to allocate too few organs to too many people, all of whom need an organ to survive (Ubel & Loewenstein, 1996). The number of persons with end stage renal disease (ESRD)—all of which need a life-saving kidney transplant—continues to exceed the number of kidneys available (Patzer, 2011). The prejudice and a theme that encompasses unfavored group traits, is an unethical preference for certain favored groups (or traits), whenever the need for something vital is greater than the supply (Danovitch, 2014). Currently, this prejudice seems to disfavor those of less useful physical or mental

ages, corresponding to a potential bias during transplant candidate assessment (Grams et al., 2012; Wightman et al., 2014). This prejudice has had many names across human history, suggesting that overvaluation of some humans (more human) and undervaluation of other humans (less human) has helped make these difficult decisions (Hodson, MacInnis, & Costello, 2014). The past and a corresponding theme of candidate assessment across time, includes a history of official assessments constructed to reduce a much larger pool of candidates to a smaller number, accompanied by accusations of bias in that criteria against less favored groups. The past also includes a history of unfavored traits, grafting living things to prolong the survival of a grouped idea of those living things, and various forms of candidate selection. The premise covers the main theme of this dissertation, which posits that assessment bias has been occurring during the choice of organ candidates. Recent additions such as psychosocial criteria (used to help screen candidates for kidney transplantation) exhibit a potential bias against certain groups such as the elderly and the intellectually and developmentally disabled.

In summary, this section provides the background needed, in preparation for the method introduced in chapter three. This background chapter is provided to aid understanding the premise of this research. This chapter also provides arguments for the systematic collection and analysis of observations, to see whether this premise might contribute to the existing literature.

How the literature was surveyed. The background literature was explored using the search features of university libraries (Grand Canyon University, King University, and University of Phoenix), and Google Scholar, each of which permitted discovery of peer-reviewed articles. The databases scanned included Academic Search Complete,

Credo Reference, Dissertations and Theses, Dissertations and Theses at Grand Canyon University, eBook Collection, eBrary, EBSCO host, JSTOR, Mental Measurements Yearbook with Tests in Print, ProQuest, PsychInfo, PsychArticles, Sage, Social Sciences Citation Index, and Web of Science. The curricula vitae of the individual authors were also used to identify relevant scholarly works associated with primary authors' most recent (or seminal) research, along with recommended sources available by scanning academic ListServs such as the American Psychological Association's Division 24 ListServ. Search terms included psychological assessment, end stage renal disease, ethics of solid organ transplantation, prejudice models, intellectual disability, discrimination, social justice, antipathy and prejudice, prejudice and Allport, semantic differential, stereotype content model, interspecies model of prejudice, and amensalism. Religious works were identified and scanned separately, using tools such as SwordSearcher® study software, which offers theologically studied content in multiple languages, keyword etymology and comparison, and corresponding links to authoritative reference works that expound on those themes. In addition to surveying existing literature, subscriptions to recent scientific developments in closely related fields were used to identify the most current research developments (including cell biology, sociology, anthropology, cognitive ethology, environmental science, and neuroscience), and primary authors were interviewed to clarify relevant concepts.

Background of the problem. End stage renal disease (ESRD) is a serious physical condition the outcome of which is always loss of life (Patzer, 2011). Medical science can delay death using techniques such as hemodialysis, however the technique itself has been described as intolerable. Many take their own lives rather than face a

future of treatments, and they will eventually die anyway because hemodialysis only delays the inevitable. Solid organ transplant offers a way out of this intolerable condition—a new kidney from a cadaveric or live donor to replace the old one. Persons with ESRD often look forward with hope to receiving a donor organ (even if that future too can be difficult to manage). The problem has been that there are far more persons who need an organ than available organs (Patzer, 2011). This in turn has created an equally intolerable condition in which medical professionals are faced with the task of developing criteria to help decide who lives and who dies. Inevitably, those who are refused an organ will feel unfairly treated by society and agitate for inclusion in the general pool of those whose human rights are not in danger of exclusion (Fyson & Cromby, 2013; Ubel & Loewenstein, 1996).

The literature on the evolution of this problem was thoroughly surveyed and is presented in this chapter. The literature on the psychological study of prejudice against some groups and favoritism for others was surveyed and is presented in this chapter. The literature on the discovery of and industrialization of grafting living tissues between living things was also surveyed, as well as the difficult ethics it has engendered, and these are also presented in this chapter. The history and current state of the premise of this research—which proposes that the criteria used to screen candidates for receipt of sparse organs are biased against certain unfavored groups such as the elderly and the young that are intellectually impaired—was also surveyed and is presented in this chapter. This survey of the literature provides a backdrop against which this research argues its hypotheses.

This survey of the organ recipient selection problem, the prejudice against certain groups, the past discovery of how to prolong life but not how to avoid trait bias in the process, and the premise that some groups enjoy prolonged life while other groups are neglected by assessment, points to a gap in the research. In summary, the problem is that the number of persons in need of a transplant is greater than the number of kidneys available. The research of selection criteria suggests that the elderly have been delayed or denied a transplant because of age stereotypes, even though their post transplantation outcomes have been similar to younger candidates (Grams et al., 2012). The research of selection criteria also suggests that those with intellectual or developmental disability have been delayed or denied a transplant because of intellectual stereotypes, even though their post transplantation outcomes have exhibited similar success to those without this disability (Wightman et al., 2014). The past of this problem includes a human perception that living tissue is mainly here to prolong mental life, or to exploit for economic growth. This research argues that assessments of mental fitness have been historically used to screen out mentally feebler candidates from among the population of physically viable candidates, whenever the demand for vital resources has outweighed the supply.

Theoretical Foundations and Conceptual Framework

The model for this dissertation is based on a set of evolving models of prejudice in the psychological literature, leading up to a novel model suggesting a prejudice which may be described as *mental favoritism*. Each of the prior models of prejudice have successfully described the various relationships between the classes that prejudice describes. This evolution of models may be summarized by three perspectives: (a) human v. human prejudice, (b) human v. non-human prejudice, and (c) human enough v. not

human enough prejudice. In the first model, the stereotype content model (SCM),

prejudice has been modeled as human to human, and to reach affection each human must

demonstrate competence (Fiske & North, 2014). In the second model, the interspecies

model of prejudice (IMP), prejudice has been modeled as human to animal, and to reach

affection each animal must exhibit service (Costello & Hodson, 2014). In the third model,

the Value/Threat model, prejudice has been modeled as more human versus less human

and to reach affection each human must appear similar (exhibit group value but not group

threat). In this model, to reach acceptance and survival, each living thing (human or

animal) must identify with one thing, and dissociate itself from with every other thing (as

though to identify with anything else were a threat to the survival of that jealous thing;

Hodson, MacInnis, et al., 2014). The Value/Threat Model has proposed that "humanness"

is the thing which humans must identify with, and this overvaluation of anthropocentric

things results in the need to over-humanize similars and under-humanize dissimilars. This

model is especially helpful in highlighting how the need to finely distinguish similar

things results in prejudice (e.g. the fusiform gyrus appears to perform this function by

fine distinction of human faces within one's group, in order to guess which to trust and

which not to trust). In the past, the superhuman classes have approached deification or

enduring group value, and the subhuman classes have approached demonization or

enduring group threat (Gilhus, 2006; Hodson, Kteily, & Hoffarth, 2014). According to

Roberts (2015), estimates of intelligence have historically been used to define more

human from less.

However, the hallmark of each of these models has been a distinction between

what is held to be superior (more) versus what is held to be inferior (less)—even when

each side of the comparison is said to be from the same species or in the same category. The splitting of similar things seems to occur because of a common need, the satiation of which is not common enough to go around, resulting in a logic which cannot succeed—because the cost to the many must eventually exceed the benefit of the few (de Spinoza & Curley, 1994; Kahneman & Deaton, 2010). The splitting of similar things eventually looks like four quadrants (like the extended SCM model in Figure 3) with almost uncanny mixtures of likability and unlikability on the diagonals. The need to sustain what is more desirable to the majority is often used to justify the deprivation of minorities (who are less desirable), and to emphasize the need for the over-survival of the liked group and the under-survival of minorities (Fiske & North, 2014; G. Henriques, personal communication, June 17, 2016). In this dissertation's model of class prejudice, mental fitness is held to be superior to simply being physically alive, with the former (mental superiority) often assessed to determine access to physical well-being (self-esteem and social intimacy) and even to determine the allocation of organs needed to survive.

This extension of the prior models is argued on the evidence that mental differences do not differ significantly from physical differences (because both kinds of differences are eventually distinguished using the same mental affordance, similar to the way computer signals stored as binary data may be viewed as text, numbers, images, or audio). The mental processing of physical stimuli may even reorder the arrival of external stimuli to accord with preexisting internal beliefs (Frissen, Ziat, Campion, Hayward, & Guastavino, 2012). Equivalent terms used to describe biological symbiosis (mutualism, commensalism, parasitism, and amensalism) may be used to aptly describe the mixed attitudinal dimensions in the four quadrants of the SCM model of prejudice (Brucker &

Bordenstein, 2012; McIntyre, 2014). As well, there are empirically studied parallels between biological disgust for parasites and infections, and psychological disgust for people (who are looked upon as parasites and health risks), eerily linking biological sights and savors with imaginary moral domains (La Rosa & Mir, 2013). This new model of prejudice appears in Figure 3 (the mental favoritism model or MFM). These well-defined and well-studied terms from the biological sciences seem to apply whether they occur between more human and less human, real humans and non-human animals, or simply more cognitive and less cognitive creatures. The exceptionalism exhibited by mental attitudes and mental reverence approximates a perspective biased in favor of mental survival, rather than the manifest superiority of intellect over natural/biological systems (Debernardi & Serrelli, 2013; Margulis, Asikainen, & Krumbein, 2011).

The enduring overvaluation of one group or criterion can be framed as a jealous group bias for the enduring undervaluation of every other group or criterion (Hodson, MacInnis, et al., 2014). Work by Fiske (2013) suggests that prejudice is a social psychological construct that stems from the human habit of mentally subdividing the members of a physical species into psychological classes. Consequently, those diverse physical species struggle to identify with where they fit as lasting individuals (or cluster as a group of lasting individuals) within those mental classes (Gilbert, Sapp, & Tauber, 2012; Margulis et al., 2011). Curiously, this was what Erikson described with his famous psychosocial crises as well, and which Marcia (2014) described well as identity crises. According to Fiske (2013), this struggle is not so much natural as it is societally obligatory upon each individual, so that each individual can reach a basic human need (which is physical) by earning social status (which is not physical). This too is the

hypothesis of this dissertation, because whenever living things are assessed on the basis of psychological criteria, their physical needs take a "back seat" to mental criteria. As Biernat and Danaher (2013) phrased it, the mere act of mentally categorizing some things as in and others as out is all that is required for a group prejudice (called *presentiment* in Dostoyevsky's terminology and *praejudicium* in Western thought). Darwin's theory of a struggle for existence "in a large sense" continues to apply even if that struggle is conceptually extended to include mentally fit species versus physically fit species— whenever an egalitarian allocation of basic needs is not possible (Darwin, 1876, p. 39).

The theoretical model for this research was chosen because the recent addition of psychological assessment exhibits a prejudice for mentally fit candidates—when other candidate factors are equal (De Pasquale et al., 2014; Kumnig, Jowsey, & DiMartini, 2014). A review of the literature suggests that most who perish prematurely have to wait the longest and thus indirectly perish by neglect, fitting a theoretical framework called the stereotype content model (prejudice based on value to society). Just as social status can be plotted in one of the four quadrants of the stereotype content model of prejudice, kidney organ candidate wait time can also be plotted in those same quadrants (see Figure 6 in Appendix H, the intellectual stereotype model or ISM). As well, mental favoritism (versus biological favoritism) fits the same two axes (competence versus warmth) and also aligns with the same odd blends of public opinion, when deciding which candidates will survive end stage renal disease (Ubel & Loewenstein, 1996).

Review of the Literature

The literature was researched to find the history of this topic up to the current state of research on this topic. The themes that were identified were: a problem allocating

organs ethically, a prejudice against less productive physical and mental age groups, a past of using candidate assessment to reduce too many in need to a practical number, and the premise that candidates need more mental fitness than physical fitness to receive a transplant. These themes are examined in the following.

The problem (organ allocation). The problem is that the ethical allocation of sparse organs seems insoluble. This theme is about the paradoxical need to allocate too few organs to too many people, all of whom need an organ to survive (Ubel & Loewenstein, 1996). As the concepts of supply and demand diverge (because the industry of selection and allocation is prospering, and transplantation is no longer rare—whereas viable organs remain rare), the need to develop more critical selection criteria in the public interest creates a new problem (Danovitch, 2014). The prior insoluble allocation dilemma fosters a subsequent and equally insoluble assessment dilemma (because now medical professionals must agree upon more stringent criteria regarding who lives and who dies, even if most are in the same broader category). Human beings denied an organ invariably feel unfairly treated, whereas some kind of bias must be adopted to allocate too few between too many (Burgers, 2016; Patzer, 2011).

Ubel and Loewenstein (1996) surveyed the public to test whether the beliefs held by the industry of pediatric organ candidate selection matched those of the public, and found that the public would have allowed organ transplants to almost any child even if the industry would not—regardless of merit. Patzer (2011) analyzed data in the U.S. Renal Database System (USRDS) and found that the elderly (candidates over 65 years of age) who had been screened out during assessment would have survived just as well as those who were not screened out. Cherkassky (2011) analyzed the process of screening

candidates based on intellectual disability and provided evidence that the very traits that defined them as a group were inadvertently excluding them from reaching equal human selection status. Wightman et al. (2014) analyzed data in the USRDS and found that candidates under the age of 18 who had been screened out due to mental impairment or academic underachievement would have survived just as well as those who were not screened out. These studies point to a non-essential bias for certain kinds of candidates (for example, too young and unlikely to become mentally competent, or too old and unlikely to become physically vigorous again). This bias seems to favor younger candidates of superior mental fitness, and whom possess the mental ability to care for the survival of a scarce organ (which has no mental ability of its own). This theme can be further understood by covering key topics such as end stage renal disease, that many need a transplant, that few organs are available, and that these seem to result in an insoluble ethics of selection.

End stage renal disease. The final stage of kidney disease is called end stage renal disease (ESRD). According to Patzer (2011), this stage is when the physical body is no longer able to filter out and remove waste products through urination, resulting in uremia (i.e. the bloodstream becomes toxic and poisons the cells). Although kidney hemodialysis can prolong survival (by filtering the blood through an internal/peritoneal or external appliance), dialysis cannot prevent death—nor the gradual worsening of physical and mental symptoms that inexorably collapse hopes of well-being. A way out of this downward spiral is kidney replacement therapy, also known as a graft or transplant. The difference is dramatic—from an average maximum of 5.9 years of

remaining life to 16.4 years, with the possibility of an additional graft when the first one wears out (Patzer, 2011).

Many need a transplant. Even though persons with ESRD may look forward to the medical advance of a successful transplantation procedure, there are too many persons in need of a transplant. As of January 11, 2016, about 100,791 persons were on the kidney transplant waiting list. This did not include those disqualified from the list due to inadequate mental or physical fitness (National Kidney Foundation, 2016).

The actual number of persons with ESRD in 2014 was 678,383, but only 88,231 made the (active) waiting list (U.S. Renal Data System, 2016). More persons died that year from ESRD (95,254) than were on the list. The median wait time for a first-time transplant was 3.6 years (during which time the individual often succumbs to the disease before a kidney becomes available). On average, 13 people a day succumb to end stage renal disease (die) while waiting for a transplant—even if they qualify. The growing deviation between the number of candidates on the waiting list and undergoing dialysis versus transplant recipients is shown in Figure 1, from the USRDS annual report[3].
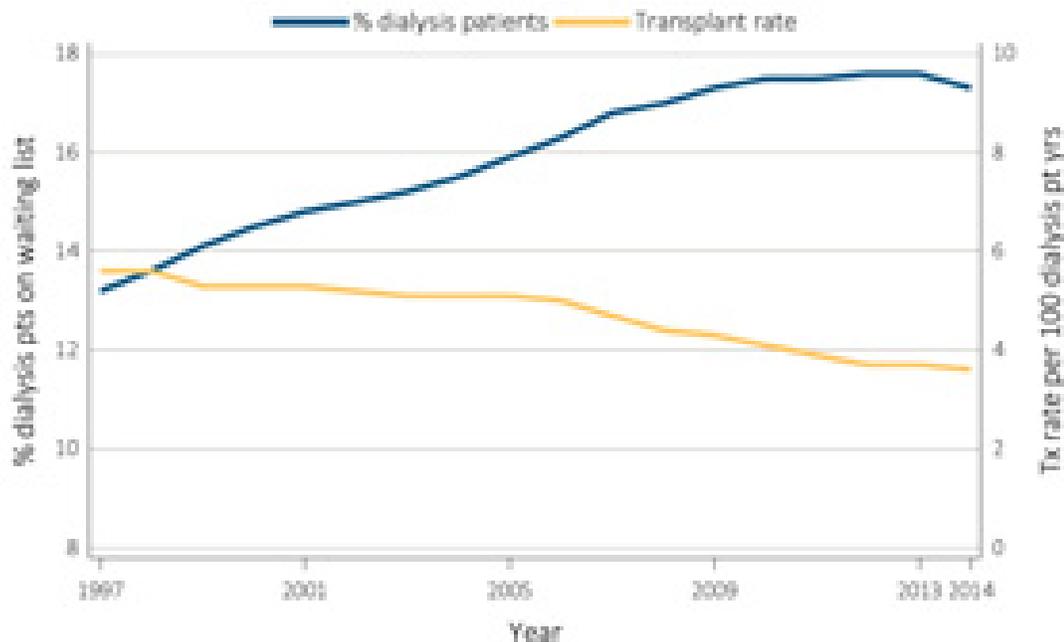
Figure 1. Wait-listed dialysis patients and kidney transplant rates, 1997-2014. Reprinted from 2016 USRDS annual data report: Epidemiology of kidney disease in the United States (p. 407) by U.S. Renal Data System, 2016, Bethesda, MD: National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases. Copyright 2016 by National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases.

Few organs are available. Even though the demand remains high, the supply of

viable kidneys available for transplantation remains much lower. The widening of this

ratio (between persons in need of an organ and available organs) continues to make the

odds of receiving one before physical death occurs less and less likely. Statistics show

that 17,914 kidney transplants occurred in 2014, whereas over 88,231 persons needed one

(not including persons in need of a kidney but not on the list of persons undergoing

dialysis and thus qualified for a kidney graft). The outcome of this relational inequality

has been a competition to "make the list" and achieve an overall score of mental and

physical fitness, so that the waiting time is lower than the chance of death.

Researchers explain that the reason for a stable supply of donor organs versus a burgeoning need for far more organs, is not random (Rodrigue et al., 2013; Shepherd, O'Carroll, & Ferguson, 2014). That research also drew from the OPTN portion of the USRDS, just as this study did for its data collection and analysis. Researchers attributed the decline of living donors in the United States to a steady decline "among men, Blacks, younger adults, siblings, and parents," along with the adverse economic situation of younger adults, criteria and waiting time variations, and a growing elderly population since the peak in donation rates in 2004 (Rodrigue et al., 2013, p. 3). A policy change prioritizing the receipt of cadaveric kidneys to candidates under 18 years of age has also been shown to be a reason for the decline in living kidney organ donations, however the overall decline (for both living and deceased donors) is not explained by this change in policy. Researchers also confirm that the donor/candidate ratio is better internationally among countries that approach organ donation as an opt-out assumption rather than a conscious choice to opt-in as a donor (Shepherd et al., 2014). Although living donations may be modestly greater within opt-in regions, lower combined donations (from both living and deceased persons) have been shown to be causally related to an opt-in policy (Shepherd et al., 2014).

Another factor is improved human health and life expectancy while there remains a shortage of viable organs which is relatively stable (Arias, Heron, & Xu, 2016). For example, life expectancy has increased from 1980 to 2012 by 6.0 years for White males and 3.3 years for White females, and by 8.5 years for Black males and 5.9 years for Black females (Arias et al., 2016). The group of adults 65 years and older has increased in size and exhibits a longer life expectancy, potentially reducing the number of harvestable

organs while increasing the demand. Efforts to expand the number of available organs have been hampered by the definition of human death, made evident by terminology such as donations after circulatory death (DCDs), expanded criteria donors (ECDs), and significant differences of expert opinion regarding the definition of physical death versus brain death (Saidi & Kenari, 2014). The harvesting of body parts after a decision regarding brain death also strengthens the argument of this dissertation—the possible overvaluation of the "mental half" and the perception that the human body (like non-human animals) represents an uncompensated repository of replaceable parts for the human brain. A logical extension of this worldview is the potential future decision to deny replacement organs to the mentally impaired, so their organs may be harvested by the mentally fit.

The age of the recipient relative to the age of the donor is not of major concern (Dharnidharka, Fiorina, & Harmon, 2014). Children as young as two years of age, if their body cavity can accommodate an adult kidney (usually when a child reaches at least 14 to 22 pounds in weight), experience successful transplantation outcomes. Researchers explain that matched age allografts among children have less chance of survival due to thrombosis (blood clots). Adults, on the other hand, can readily adapt to a kidney from a very young child. According to Dharnidharka et al. (2014), "Kidneys from deceased donors who were very small children are no longer allocated to small children but are, in fact, now transplanted *en bloc* (both kidneys together . . .) into adults with excellent results" (p. 552).

The ethics of selection. This theme (the problem of organ allocation) suggests a fundamentally insoluble issue in the allocation of sparse kidneys and the selection of

needy candidates. The demand is much higher than the supply, and this relationship continues to get worse (Choi, Gulati, & Posner, 2014). The limited supply creates the need for difficult decisions, and the criteria needed to make these decisions may engender moral and ethical questions more difficult than the decisions themselves. Several scales have gained popularity that can identify and prescreen candidates that have psychosocial risk factors, thus allowing some to be referred for further psychological testing prior to making the waiting list (Maldonado et al., 2012). Several groups argue that this practice is unfair to individuals with intellectual disability (Baynton, 2013). More importantly, any delay in reaching the waiting list increases the odds of dying from the illness, since waiting time (not criteria) has been shown to be the most significant risk factor (Meier-Kriesche & Kaplan, 2002).

One possible solution is to allow the buying and selling of organs, yet such a proposition is neither permitted by law nor would public opinion view this issue lightly (Choi et al., 2014). Some legal researchers have suggested workarounds such as the ability to donate a kidney in exchange for a donation of funds to a designated charity. This is called an *altruistic exchange*. A one-sided or two-sided altruistic act would then indirectly provision the buying and selling of organs, if passed by Congress. Legal researchers have hypothesized that this would motivate more donors (out of altruistic motivation) and thus increase the supply, lessening the need for stringent criteria during the selection of candidates (Choi et al., 2014). However, new issues arise such as whether these altruistic contracts will be honored by both parties, or whether the organ will survive the donation/transplantation process. As well, altruistic exchange is still a commerce of human organs, albeit indirectly.

The problem (organ allocation) seems an effort to circumvent an ethically insoluble issue. This results in the need for ever-more specific candidate criteria as the gap widens between the number of individuals in need of an organ and the stable number of donor organs. This problem suggested a research opportunity—to compare groups of candidates on the kidney transplant waiting list, and analyze which groups wait the longest to receive a kidney.

The prejudice (physical/mental age). The prejudice (and a theme that encompasses unfavored group traits), is an unethical preference for certain favored groups (or traits), whenever the need for something vital is greater than the supply (Danovitch, 2014). Currently, this prejudice seems to disfavor those of less useful physical or mental ages, corresponding to a bias for those who are just right (Grams et al., 2012; Wightman et al., 2014). This prejudice has had many names across human history, suggesting that overvaluation of some humans (more human) and undervaluation of other humans (less human) has helped make these difficult decisions (Hodson, MacInnis, et al., 2014). The prejudice is a bias during candidate assessment which results in groups with specific traits having to experience longer wait times for life-saving kidney transplants than others. This prejudice seems to correspond to prior models of group prejudice, for example the antipathy/banality perspective by Allport, in which those with a set of favored traits (successful white males for example) receive more resources than those without those group traits (those of a different income level, skin color, or gender), when the common need outweighs the common supply (Glick & Fiske, 2012). The efficient separation of individuals into groups according to favored traits, to help asymmetrically allocate group resources, has a broad presence in history and literature (Adams et al.,

2013). However, the theme of a possible prejudice in the difficult process of selecting fit human candidates for continued survival (when an equal number of fit human organs is not available) warrants outlining.

Maldonado et al. (2012) explained that the need for criteria in the process of choosing suitable candidates began with identification of biological rejection factors. Chacko, Harper, Kunik, and Young (1996) stressed that more stringent criteria came later as the success of the transplant procedure permitted more procedures to be performed annually—despite the numerically stable number of healthy donor organs relative to the rapidly growing number of qualified candidates. Ingsathit, Kamanamool, Thakkinstian, and Sumethkul (2013) brought evidence that, tragically, a large number of candidates perished even after being approved for transplant, while waiting their turn on the organ waiting list. Grams et al. (2012) and Wightman et al. (2014) studied the waiting list and brought evidence of selection bias in the form of ageism (against those too old to work) and ableism (against those too young to work), despite the equivalent survival of candidates disqualified from or delayed from transplantation. What was needed was a study comparing the wait times of the delayed groups, to test for a bias in the criteria that favored certain candidates (e.g. neither too mentally young nor too physically old). The present study analyzed this, and found evidence that this might be most the recent effort to make best use of a numerically stable supply of rare donor organs (about 17,000, mostly cadaveric) while the candidate waiting list (about 100,791) continues to grow by 36,000 individuals each year (National Kidney Foundation, 2016).

Psychological assessment is newer and its standardization is still in process, whereas physical assessment has established criteria which are more difficult to debate.

The increasing number of qualified candidates and the incapacity to wait on a list more

than a few years before succumbing to end stage renal disease, is requiring an increase in

the criteria needed to score and thus screen out qualified candidates. The new criteria

favor modern qualities such as mental fitness over physical viability, on the basis that

mental fitness is needed to hold a job and host the care of the grafted organ. This form of

intellectual bias is equivalent to other forms of prejudice, such as heritable traits, race,

age, gender, ethnicity, or socioeconomic status during the allocation of sparse resources

among culturally favored groups. Those with healthy bodies but challenged mental

faculties seem unfairly screened out, or delayed until they indirectly perish. The impact

suggests a large difference between the number of transplants for candidates with ideal

physical and mental qualities versus candidates that already meet strict minimum

qualifications (see Figure 2 from the USRDS annual report[3]). This theme can be further

analyzed by covering topics such as physical age, mental age, competence over warmth,

grafting over natural outcomes, planned over natural propagation, and the (much debated)

bell curve of human intelligence used in the past to justify asymmetric allocation of

sparse resources.
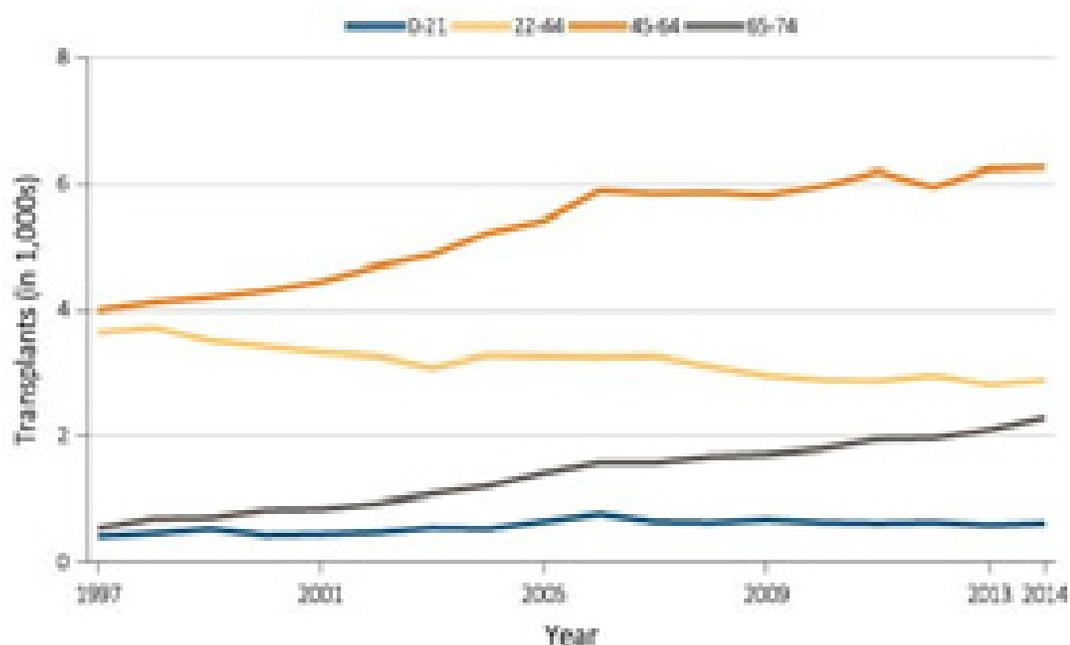
Figure 2. Number of kidney transplants by age, 1997-2014. Reprinted from *2016 USRDS annual data report: Epidemiology of kidney disease in the United States* (p. 414) by U.S. Renal Data System, 2016, Bethesda, MD: National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases. Copyright 2016 by National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases.

Physical age. Bias against a less-than-ideal physical age has a long history.

Different age cohorts (such as those too young, too old, or too slow to be productive)

have experienced marginalization by the predominant age group. The elderly, having

outlived their productive years, are frequently perceived as liabilities—unlikely to

contribute as much as the "just right" group between the ages of 18 and 64 (Curtis, 2006).

The young, if they seem unlikely to develop academically and intellectually, are also seen

as liabilities, with inconvenient (special) needs that detract from the already

overburdened educational resource pool (Derrington et al., 2016). Yet, in 1901, G.

Stanley Hall and Preston Willis Search published works on the disturbing overemphasis

on intellectual development over physical well-being. Search (1901) described this as "a

failure to recognize the physiological needs of pupils" and their "physical deterioration" (p. 51-52). Hall described it this way in Search (1901):

> When a child begins to go to school the change of his environment is very great. Instead of constant activity, he must now sit still and keep still; instead of moving his hands and arms freely, the strain of effort is now focussed [*sic*] upon the very few tiny, pen-wagging muscles. The eyes, instead of moving freely, are confined in the zigzag treadmill of the printed line. It is no wonder, therefore, that the child so commonly loses weight on first entering school; that short-sightedness and other eye troubles increase almost regularly through the school period; that headaches, anaemia, scoliosis, defects in development if not signs of disease, appear in the stomach, heart, and lungs, and especially in the nervous system, the gradual deterioration of which is hard to recognize. (p. 55-56)

Search (1901) went on to emphasize that "there is absolutely nothing in the legitimate field of intellectual activities that need deteriorate physical health" (p. 57). Holzman has advocated that society foster *non-knowing growing* (Holzman, 2014; L. Holzman, personal communication, August 5, 2016). A prominent educator of his day, Search (1901) stated that "play is one of nature's methods for healthful development, and has a rightful place on the curriculum as any other subject" (p. 7). The emphasis on mental health and mental productivity instead of physical joy and social play continues to result in negative developmental outcomes, and an eventual incapacity to understand the needs of others or to comprehend each other's physical thresholds (Arger, Sanchez, Simonson, & Mezulis, 2012; Gray, 2013; Panksepp, 2010). Psychological assessments that favor intellectual development and age-related criteria (which are less likely among

the very young and very old) may be neglecting other factors, such as how society treats people hoping to get a transplant (Ubel & Loewenstein, 1996). The industry of culling candidates with undesirable traits may eventually lead to genetically unsurvivable traits, while trying to accommodate untenable numbers of persons in need of psychological therapy (Fischer-Mamblona, 2000; Grandin & Johnson, 2005).

Mental age. Social bias against groups whose mental age seems less developed than their physical age has a long history, dating back at least to Francis Galton, who is credited as the father of the eugenics movement. This scientific movement argued that intelligence was an inherited trait, resulting in a kind of mental fitness and justifying of social privilege (Roberts, 2015). The first mental assessments were conducted in London in 1882, to emphasize a believed association between intelligence and inherited social status versus the possibility there were simply better social conditions for the elite. These tests of cognitive superiority and cognitive inferiority allowed the ranking of individuals by a score of mental fitness, mainly to help legitimize and maintain the unfair social order. Although Alfred Binet (author of the IQ test) objected to the use of his test as a means to measure the cognitive ability of school children, it gained widespread popularity in the United States for that purpose. This mental test was used after 1904 as an efficient way to measure large numbers of school children for cognitive impairment. Intelligence testing was further confused with moral ability, resulting in ranking the moral and social worth of various groups of human beings according to intellectual superiority (Roberts, 2015).

Mental assessment also became a useful criterion on Ellis Island in 1913 for Goddard, who helped implement the screening of large numbers of immigrants for

mental impairment. The similarity of screening large numbers of immigrants to reduce their number to a manageable figure, and the screening of large numbers of transplant candidates to reduce their number to a manageable figure, seems evidential. Goddard maintained, as Galton did, that cognitive impairment was inherited and would probably result in unproductive or criminal behavior if permitted entry (Roberts, 2015). Brigham, in 1923, concluded that the intelligence testing of army recruits in large numbers helped point out the inferiority of certain races such as those of "Alpine" or "Mediterranean descent"—along a downward spiraling spectrum of superiority from White to Black. Brigham's analysis in particular suggested mental bias was present during the analysis of data from psychological assessments.

Roberts (2015) argued that psychological assessment continues to try and rank persons by "higher or lower intelligence based on biological differences" and thus predict their "suitability" to fill productive social roles (p. 51). Baynton (2013) stated that the modern prejudice against disability (based on physical age or mental age) is part of a long tradition of justifying inequality across U.S. history—by means of "unequal and differential treatment" (p. 33). After accusations of prejudice and discrimination against the female gender and dark-skinned races, mental incapacity has also functioned as a justifiable discriminatory dimension. Similar to a statistical, causal-comparative design like the one used for this study—in which the measured traits of candidates cannot be manipulated—marginalized groups cannot change their social categories and thus disprove society's reasons for them to be marginalized. Baynton (2013) explains that the same basis for unequal treatment of women (less rational, too emotional) is synonymous with "mental disability" among men (too sensitive aka "neurotic"). Rather than deny

these differences, these groups have appealed to the dominant group to see these differences as different, not inferior. Even the concept of handedness (chiral preference) has been historically viewed as a flaw in a right-handed societal ideal, and those deviating from a right-handed preference have been compelled to conform (Corballis, 2014).

Competence over warmth. The need to know what to trust and thus survive and perpetuate the species has created a need to remember what to trust, usually in the form of social learning (P. Haikonen, personal communication, September 19, 2016). Unfortunately, since living beings do not live forever, what living beings need is something that will never die. This paradoxical demand suggests the human species exhibits a struggle to preserve psychological certainty in a biological species. As humans cannot imagine losing what they are attached to, their memory consolidates histories of imaginary associations between lasting internal phenomena (things that happened) and transitory external phenomena (the experience of existence itself). Some of these lasting thoughts become consolidated as "itself" and "its terrified group" (because these thoughts "hurt" when recalled—a memory of physical pain or loss) while most other thoughts seem to be "strangers" (because those thoughts cannot be remembered and thus cannot induce physical pain; P. Haikonen, personal communication, September 19, 2016). Even obvious physical suffering in others (*pathos*) is ignored, because their pain has never been experienced (Alevriadou, 2016; Biernat & Danaher, 2013; Gilbert et al., 2012; Leyens, Cortes, Collange, & Renesse, 2014). Thoughts of warmth (physical expectations) are thus traded in exchange for something real (often a promise of tangible warmth in exchange for dedicated service to a thought or ideal, so that it does not "perish"). The

famous Skinner box serves as an example of this superstitious reverence for a dearly missed outcome, learned via accidental or intentional reinforcement (Seligman, 1967).

The stereotype content model (SCM) functions as a measurable visualization of this (learned) emotional dependency on social cognitions (like bargaining behavior). The SCM has accumulated significant empirical research—arguing that biased attitudes are not just about hostility, or black and white dimensions. According to Glick & Fiske (2012), this model can show how almost arbitrary, prejudicial (cold) and non-prejudicial (warm) attitudes tend to cluster into four quadrants of paradoxically blended cognitive/affective concepts.

These frequently symbolize the perceived "fitness" of another group (its *competence* at magically bringing warmth and comfort), but oddly in terms of one's feelings of trust in and belonging to that feared (superior) group (the hope of *warmth*; Fiske, 2013). If a group with a certain set of traits is viewed as both competent (fit) and with feelings of affection (warmth) too, that group escapes being seen as a potential threat (the competition) and becomes a friend or ally (a resource or promise of future "security"). The suggestion that the criteria for candidate assessment seem to reward competence with warmth is almost uncanny (Ubel & Loewenstein, 1996).

Per Roberts (2015), the history of ingroup prejudice shows a remarkable clustering of outgroups that have represented imaginary threats to ingroup status (for example, *feeblemindedness* during the eugenics and immigration fears eras). These have corresponded to fears of biological contamination, often embodied in abstract group cognitions that believed they had been "chosen" to survive. This bizarre fear of mental mortality (rather than physical mortality) has a prominent place in psychological research

as *terror management theory* (TMT). In this theory, fears of ideological mortality ("mental death") represent a lasting conflict between the "mental ingroup" and the biological competitors it sees as impediments to (or resources for) its eternal "mental" survival (Biernat & Danaher, 2013; Leyens et al., 2014). This threat/value model is also posited by Hodson, MacInnis, et al. (2014) and has a presence in the literature as the *super-self* or *Übermensch* (Crowell, 2016; Cybulska, 2015).

    Grafting over natural outcomes. One of the questionable ethics of grafting plants has been the desire to scorn/avoid juvenility (to skip the epoch of childhood due to lost time and increased costs) and thus reach flowering and fruiting sooner. The unproductive epoch of free growth (juvenility) does not seem favorable to human industry (Mudge, Janick, Scofield, & Goldschmidt, 2009). Lessons learned in agriculture seem to have been applied to human development, with a gradual foreshortening of undirected playtime in exchange for earlier mental education.

    The view that grafting one living thing into another does no harm may also be an inaccurate perspective, if researchers are correct. Margulis et al. (2011) use the term *chimera* to describe the human organism whose many living parts and purpose contribute to the survival of a living system. This unusual ecological perspective has challenged the confusing paradigm called Cartesian dualism (a mental half and a physical half). If so, mental prejudice is not only unfair, but inaccurately overvalues what only appears to be a separable mental actor with interchangeable (disposable) parts. The view of salvaging (harvesting) living things to prolong a phenomenal self may not be scientifically sound (Gilbert et al., 2012; Margulis et al., 2011). If research frontiers continue to affirm these findings, a separate mental assessment contingency may need reevaluation—especially

since many applicants do not even reach the waiting list. After a brief, gross mental assessment, they are referred out for further psychological tests, and the delay in reaching candidacy means the person will perish (Meier-Kriesche & Kaplan, 2002).

Planned over natural propagation. Another questionable ethic of grafting plants has been the unnatural prohibition of sexual activity to foster offspring with specific traits (Grandin & Johnson, 2005; Mudge et al., 2009). Human individuals with severe mental illness have also been prohibited from mating and bearing offspring in many cases—while those with sufficient mental fitness (meaning industrial fitness in most cases) are not constrained (Baker, 2017). A connection to the eugenics era is possible (since the eugenics movement also evolved from knowledge gleaned from the genetic study of and manipulation of plants). If those with intellectual disabilities are prevented from growing up to bear offspring, it is possible their lives are foreshortened to prevent offspring, when society decides which humans will receive scarce organs.

The bell curve of human intelligence. In 1994, a book called *The Bell Curve* was published reiterating a scientific basis for mental prejudice. This work argued against social programs for the impoverished on the basis that their condition was genetically irreversible, similar to stereotypes about persons of Asian or African descent outlined by Rushton (Mason, 2013). The scientific literature exhibits prominent works such as this, arguing for the non-allocation of sparse resources to those of inferior mental capacity. These arguments have sought theoretical and empirical evidence to alter public opinion in the interests of cost-efficiency and ethical use of resources, while raising questions about actually representing the interests of the public. According to Ubel and Loewenstein, for

example, the decisions made by the transplant system do not agree with the altruism

exhibited by the general public (Ubel & Loewenstein, 1996). The authors stated:

> It is possible that many transplant surgeons would not transplant a patient whose
>
> chance of surviving after transplant was only 20%. Yet a majority of subjects in
>
> this study would give them almost equal priority in receiving organs as patients
>
> with much better prognoses. (Ubel & Loewenstein, 1996, p. 1054)

Moreover, the bell curve symbolizes the predominant group's "right" to commit human

rights violations (United Nations, 1948).

The past (candidate assessment). The problem, prejudice, and premise can be

understood more thoroughly by deeply investigating the past literature on assessment

construction and use, prejudice research, the origins of grafting, and the struggle to deal

with the difficult ethics associated with grafting. This section and its theme regarding the

past of candidate assessment and related subthemes is provided to serve as a background

to understand the evolution of candidate assessment across history, leading up to the

modern transplant ethics dilemmas. This theme covers a range of topics such as the

history of assessment, the history of prejudice research, the history of excluded traits, the

history of grafting living things, the paradox of ethics while grafting living things, the

history of organ transplantation, and the history of candidate selection.

The history of assessment. A succinct history of psychological testing is

mentioned in Greenwood (2015). The testing of levels of intelligence and the ability to

fill social roles dates back at least to ancient China around 2200 BC to determine fitness

for public offices. Criteria were based on cultural belief systems at the time, such as

Confucianism, and were continually updated in search of the most effective selection

criteria. Modern psychological assessments of general mental fitness may be traced back to the late 1800s with the experimental work of Wundt and Galton, and early 20th century work by Cattell. Binet introduced the intelligence scale in 1905 and Goddard drew from this work to develop criteria to reduce the overwhelming number of immigrants to a more reasonable number representative of desirable candidates. Terman revised work by Simon and Binet and developed the Stanford-Binet test. The need to develop criteria to screen the overwhelming number of recruits during the world wars also added to the development of testing criteria. The Wechsler Intelligence Scales for adults and children were added between 1939 and 1949 (Greenwood, 2015).

The history of prejudice research. A succinct history of the psychological study of prejudice was mentioned in Zuma (2014). At the beginning of the 20th century, prejudice was framed and studied as an unresolved racial problem. Thurstone is credited with studying nationality-based prejudicial attitudes among undergraduate students. Soon after, Bogardus conducted work on *social distance* to distinguish superior things from inferior things on dimensions such as intimacy, antipathy, and friendliness. Guilford's work questioned whether the new psychometric restrictions aimed at reducing immigration were excluding the opinions of the public at large in those decisions as to whom should be allowed entry (Greenwood, 2015; Zuma, 2014). Up until World War II, however, prejudice was still perceived as an unfounded racial bias. The advent of that war expanded the concept to groups that saw themselves as superior in general, since superiority has been a predominant factor in racism, and measurable using scales such as Social Dominance Orientation/SDO (Pratto et al., 2013). Allport developed what became the dominant theory of prejudice based on intergroup hostility studied under the term

antipathy (banality), remediation of which might be accomplished via intergroup contact and common goals, studied under the phrase *Contact Hypothesis*.

The Osgood Semantic Differential Model suggested the existence of social attitude dimensions such as evaluation, potency, and activity based on the meaning of social concepts (Kervyn, Fiske, & Yzerbyt, 2013). This scale allowed observation of hidden attitudes toward any mental object, such as events or non-human objects in addition to other humans. Rather than challenging the extant antipathy model or more recent models, the Osgood SD model has allowed inspection of mental/social attitudes in general, using spectrums of attitudinal contrast such as unsatisfactory/inadequate to satisfactory/adequate, bad/evil to good, and valueless to valuable (Fennell & Baddeley, 2013; Mattson, Rogge, Johnson, Davidson, & Fincham, 2013).

The antipathy model of prejudice was challenged when researchers provided evidence that both positive and negative emotions were involved in prejudice, often blended into inexplicable combinations (Glick & Fiske, 2012). Prejudice between genders was shown to exhibit both negative and positive attitudes toward women by paternally placing women on pedestals while treating them as inferior (Rollero & Fedi, 2012). By 2002, this model of prejudice as a mixture of unfair social categorizations had matured into the stereotype content model or SCM (Fiske & North, 2014). The SCM model eventually became a significant challenge to the antipathy model, demonstrating that prejudice was a combination of stereotypical emotional and cognitive attitudes. The endearing aspect was captured in a maternalistic vertical axis as affiliative warmth/coldness, while the inferiority aspect was captured by the paternalistic horizontal axis as competence/incompetence (Kervyn, Fiske, & Yzerbyt, 2015). This breakthrough

permitted dissonant emotional mixtures to cluster into quadrants that helped explain the (often inexplicable) combinations of antinomous social attitudes. In exchange for acceptance of inferior status along one axis, outgroups could attain a measure of affiliative warmth on the other.

However, models of prejudice have centered around the human species only—while maintaining implicit prejudice against non-human species by continuously denying their inclusion in the calculation of biological fairness. In seminal work by Costello and Hodson (2014), researchers asked whether prejudice was excluding something more than a single dimension like antipathy, or even a mixture of clustered dimensions suggesting ambivalence. Perhaps research on the social psychological concept of prejudice was excluding irreconcilable mixtures toward living things in general, since the same animals (dogs and cats for example) were viewed as both endearing companions and as inferior species too, just like women. Across multiple studies, these authors have shown how human to human prejudice is a developmentally learned cognition variously applied to immigrants, the Black race, outgroups, and non-human animals—but first acquired as the belief in the superiority of the human species over animals and their subsequent subjugation (Costello, 2013; Costello & Hodson, 2014; Hodson, Kteily, et al., 2014). Further, these authors have shown that rethinking the human-animal divide can alleviate human to human prejudice too (Dhont, Hodson, Costello, & MacInnis, 2014).

Although the model of prejudice has been expanded to be far more encompassing, a gap remains connecting the notion and science of prejudice to the study of human cognitive distinctions themselves. In the competition for survival, biological species seem to be losing the struggle against *mental species*, even though mental activity cannot

survive without them (Gibbons et al., 2000). This suggests a strong equivalence to an

ecologically amensal relationship, not just a psychologically prejudicial relationship,

between "mental" and "physical" species. An opportunity exists to add mental bias to the

long list of types of bias. Much like the demeaning attitudes often held by males for

females, or humans for animals, mental phenomena seem to view physical phenomena as

endearing yet inferior (Glick & Fiske, 2012). The same quadrants of mixed emotions—

antipathy, apathy, pity, reverence, contempt and more—seem to aptly describe

relationships between psychological concepts and physical concepts. These equivalent

relationships are visualized in a proposed model of *mental favoritism* in Figure 3.
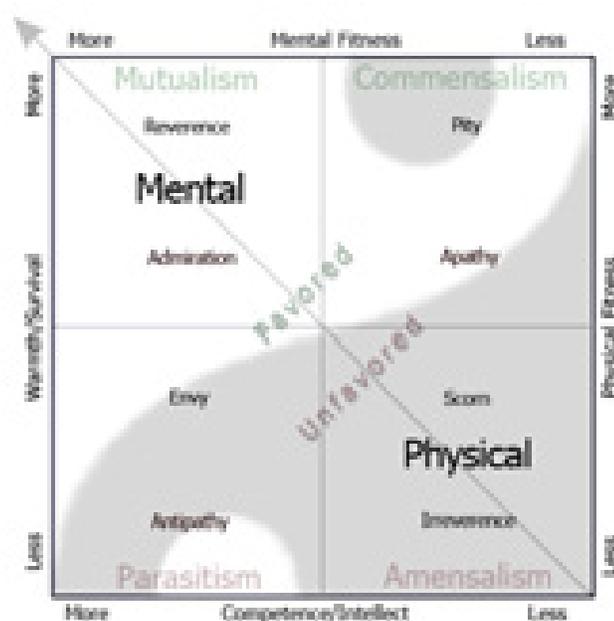
*Figure 3*. Mental favoritism model (MFM), based on the stereotype content model.

The history of excluded traits. The history of groups excluded because of

undesirable traits has been well-studied. Prejudice among the human species has

separated rich from poor, citizen from non-citizen, White from Black, old from young,

obese from fit, healthy from unhealthy, man from woman, European descent from

Mediterranean and Asian descent, highlander from lowlander, faith from faith, class from class, and ingroup (of any kind) from outgroup (of any other kind). President Madison is said to have commented on this phenomenon, yet even his comment continues to engender debate (Årsheim & Slotte, 2017). The study of prejudice continues to broaden to include interspecies models with significant data to support the hypothesis that viewing humans prejudicially is first learned by viewing animals as inferior.

This "evolution" of the study of class prejudice may be summarized by three perspectives and their respective models: (a) human v. human prejudice, (b) human v. non-human prejudice, and (c) human enough v. not human enough prejudice. In the stereotype content model (SCM), prejudice is human v. human (Fiske & North, 2014). In the interspecies model of prejudice (IMP), prejudice is human v. non-human animal (Costello & Hodson, 2014). In the Value/Threat model, prejudice has been modeled as more human (superhuman) versus less human (not human enough; Hodson, MacInnis, et al., 2014). However, the hallmark of each of these models is a distinction between what is held as superior (has more of what makes it distinct) versus what is held as inferior (has less of what makes it distinct.)—even when each side of the distinction is deemed to belong to the same distinction. Though the mind and the body are essentially one creature, they are often treated as two different creatures with differing rights.

Group differences have frequently been used to play down continuing discrimination, which in turn has helped justify unequal benefits, social privileges, or civil rights (Roberts, 2015). According to the *Justification Hypothesis*, successful humans with the capacity for language (the "superior") evolved to mentally justify their amensal behaviors against human outgroups (the "inferior") via private thoughts, inner narratives,

and large-scale justification systems (G. Henriques, personal communication, June 17, 2016). This self-justification typically occurs after the dominant group has denied access to basic needs fundamental to the survival of every group. In the end, the favored group simply has a continual, unusual environmental surplus that appears to be genetically or culturally inherited or deserved (Fiske & North, 2014). In this dissertation's model of class prejudice, mental fitness was that superior trait (as opposed to simply being a physically viable candidate), with the former (an individual's mental capacity) often assessed to determine access to intimacy and even to continued physical survival.

The history of grafting living things. Experimental surgery on living tissue—to find a cure, grow medical knowledge, or to prolong the life of one creature by shortening the life of another—has a long history prior to its scientific application. This practice is called grafting, and has been practiced on both plants and animals since the first civilizations began to experiment with agriculture and animal husbandry. Grafting and transplantation are similar terms and are sometimes used interchangeably. However, a graft is a piece from one organism joined to another host organism whereas a transplant is the uprooting of an organism and its implantation in another. Grafting of plants can been traced back to Mesopotamia circa 1800 BCE when human nomadism and migration gave way to settlements, agriculture, and horticulture (Mudge et al., 2009). Grafting and vivisection originated with experimentation on and modification of living things. These intentional modifications sought to increase favored traits such as the edible grain and fruit of seed bearing and fruit bearing plants. According to Mudge et al. (2009), "Grafting can be defined as the natural or deliberate fusion of plant parts so that vascular continuity is established between them . . . and the resulting genetically composite organism

functions as a single plant" (p. 439). This experimentation on plants logically extended to animals, in which view the organs and parts of animals and plants were seen primarily in terms of a composite, surviving entity (even if the grafted parts frequently did not survive).

The widespread practice of animal testing to better predict human health outcomes, can be traced to the ancient practices of *haruspicy* and *anthropomancy*. During haruspicy, animals were sacrificed to divine hidden meanings important to human futures (Gilhus, 2006). The same word—sacrifice—is still used in science today and acknowledged by science as such (King & Meehan, 1973; Seligman, 1967). This same word still evokes both an odd sense of compulsion to continue with the practice, and an apologetic sorrow for doing so, else risk the survival of the human species or fragile members of it. Anthropomancy was a similar practice on humans (often children). The incidental scientific knowledge gleaned from widespread ritualization and commercialization of these divination practices is recorded as part of the history of human autopsy and animal testing (King & Meehan, 1973). Both practices grew scientific knowledge and provided industries for the acquisition, transport, management, and sacrifice of animal subjects for civilizations like Rome (Gilhus, 2006). An opportunity exists to ask whether haruspicy continues in modern times under the auspices of scientific and commercial enterprises, with no benefit to the test subjects (U.S. Department of Health and Human Services, 2016; Wanderer, 2015).

***The paradox of ethics while grafting living things*.** The practice of grafting organs from one body to another was not always looked on favorably. This experimentation on plants and animals was challenged by some as unethical or unnatural,

just as some challenged the practice of human slavery to benefit food production as unthinkable (Glaholt, 2012). These challenges were not unsubstantiated, because the practice of grafting sought asexual propagation (unnatural mating), and scorned and bypassed juvenility (childhood) because it was an "unproductive" period that used up resources. Grafting coerced living things to "mate," or take on unusual forms of growth for ornamental use (or entertainment) that often killed the plant or animal. It imposed unusual size limitations on plants and animals to create "dwarf" species. It nurtured away traits favorable to the native species' growth and its self-propagation needs (seedless), and nurtured traits favorable to human food production—rather than consideration of the plant's or animal's needs (Mudge et al., 2009). The widespread use of animals for vivisection to train students in anatomy and physiology continues to engender debates. These ethical debates ask whether the learned objectivity (cognitive detachment) derived from cutting open live subjects is separable from the willingness to vivisect the human species (Vasudevan, K., & Supriya, 2011). These live subjects (which are not called "participants" as humans would be), do not have rights, although various groups strive to grant them rights. Intellectually disabled persons also seek rights, for example the right to be perceived as equals when sparse organ grafts are available to continue living.

The favoring of specific traits has not led to better outcomes. Factory farming has resulted in poultry bred to emphasize physical attributes such as meat volume and egg color. This has led to biological and psychological side effects that have decreased physical well-being and increased the incidence of animal mental disorders (Grandin & Johnson, 2005). Factory farmed chickens exhibit legs and feet that cannot support their weight, leading to considerable suffering. Specially bred roosters exhibit "raping"

behaviors—both suggesting hidden, undesirable impacts of unnatural selection when the affected species are not permitted to elect their own futures. Research science and the education of future researchers requires the dissection of large numbers of living, non-human animals without their consent or their species' benefit. Many of these are endangered wild animal species, and those not in danger survive only because they are raised solely for use by human industry (Vasudevan, K., & Supriya, 2011).

In modern cinema, the questionable ethics of hoping some individuals will die so that other individuals may harvest their organs have not gone unnoticed. Movies such as *Lifebreath* contrast the SCM's dimensions of warmth versus competence when a husband is faced with his wife's death unless a matching set of organs becomes available quickly (Posner & Watkins, Fogel, & Posner, 1997). The impending death of a beloved attachment is perceived as outweighing the ethics of hastening the deaths of less-beloved people, to make their organs available for harvest. Similar to the famous Trolley Problem, many surveys suggest that "anything goes" when faced with the imminent death of a loved one or one's beloved group (the SCM's status premise). The willingness to take the lives of millions of animals to save a few human lives connects to a long history of animal divination, experimentation, and live animal sacrifices to mental idols—which may be called a form of *cognitive idolatry* (Moser, 2002; Wanderer, 2015).

The history of organ transplantation. The methodology for this research study analyzed kidney transplantation data, representing the allocation of sparse organs to a much larger number of candidates (Appel & Vaidya, 2014; U.S. Renal Data System, 2015a). That history is very recent—with the first kidney successfully transplanted in 1954 (Barker & Markmann, 2013). Other crucial organs (the heart, liver, and pancreas)

were successfully transplanted in the 1960s and 1980s (the lungs and intestines).

However, organ rejection, biological factors, and psychological factors have plagued the

effort to extend human life. The struggle to overcome these rejection factors with an

ever-increasing demand for donor organs continues, by seeking to identify the best

criteria for candidacy (Maldonado et al., 2012).

The history of candidate selection. The selection of suitable candidates to receive

organ replacement therapy originated with the need to overcome biological rejection

factors (between organ and recipient) during kidney transplantation (Maldonado et al.,

2012). From the first kidney transplant in 1954 to an almost routine procedure (able to

extend human life) took only 30 years to develop. Eventually, the physical criteria were

standardized and could almost be methodically matched (Maldonado et al., 2012).

However, the ratio of viable organs to needy candidates could not be standardized. The

need for additional criteria was proposed by the psychiatric and psychological

communities, as a logical means to fill this gap in the medical need for difficult decisions.

According to Chacko et al., (1996):

> Given the extraordinary stresses associated with organ failure and terminal illness,
>
> and the complex process involved in the selection of transplant candidates for
>
> scarce organs, the participation of psychiatrists and behavioral scientists has
>
> become increasingly commonplace and virtually universal for certain organs. (p.
>
> 100)

As a result, over the next 30 years (from 1980 onward) there arose a new need to

formulate additional criteria—because of the increasing number of applicants and a stable

number of limited donor organs. These ethical challenges evolved into several empirical

arguments from the mental health community, which argued for the addition of

psychiatric and psychosocial rejection factors (mental assessments) to the various

biological rejection factors (De Pasquale et al., 2014; Kumnig et al., 2014).

As the allocation of sparse organs to a subset of candidates became more

commonplace, mental health professionals argued for inclusion. Available metrics

included the Health Status Questionnaire (HSQ) which surveyed both physical capability

and overall mood, and the Beck Depression Inventory to assess optimism. The Mini-

Mental State Exam could detect gross cognitive abnormalities (Chacko et al., 1996).

Once the need to argue for interdisciplinary decision-making was no longer a

need, the need to develop a means for mental health professionals to assess candidates in

a more standard fashion became important. Perhaps the most notable scale in use has

been the Psychosocial Assessment of Candidates for Transplantation (PACT). This scale

uses a 5-point scale and contains eight items, along with the ability for the rater to

express his or her impressions (Maldonado et al., 2012). Other scales include the

Psychosocial Levels System (PLS) and the Transplant Evaluation Rating Scale (TERS).

The advantage of the TERS is that it offers a summary score along with weighted scores

for each of its variables, permitting both a gross score and the ability to weigh individual

factors. A newer development has been the Stanford Integrated Psychosocial Assessment

for Transplantation (SIPAT). This standard scale, similar in form and evolution to the

Stanford-Binet intelligence test, has systematically evolved in a systematic effort to

ethically but efficiently screen out candidates which meet physical criteria but not mental

criteria (DiMartini et al., 2008). The SIPAT has been tested against the PACT, PLS, and

TERS, suggesting that it may be both more comprehensive and become a standard for

transplantation centers in general (Maldonado et al., 2012). However, to date each center uses its own method, often using these scales in the process of screening hopeful candidates, but reserving the final decision for internal decision-makers.

Even if candidates overcome selection anxiety and make the list, the candidate does not get an organ but is only placed on a waiting list. Tragically, most applicants will probably perish after being accepted—while waiting for their turn to receive an organ (Ingsathit et al., 2013). Considerable data about applications for a transplant along with relative worthiness for transplant (i.e. candidates who have passed preferred physical and mental criteria) are available in the USRDS database, which tracks data needed for Medicare insurance information. The exact cause for being rejected as a candidate by a transplantation center, however, versus physical tissue rejection outside human decision-making processes, may not be evident in the USRDS and other public renal databases (S. Morisette, personal communication, December 5, 2016).

The premise (assessment bias). The premise is the main theme of this dissertation, and posits that assessment bias has been occurring during the choice of organ candidates. Recent additions such as psychosocial criteria (used to help screen candidates for kidney transplantation) appear to be biased against certain groups such as the elderly and the intellectually and developmentally disabled (Grams et al., 2012; Wightman et al., 2014). The premise argues that the psychosocial criteria used to screen candidates are biased against less mentally superior groups, mainly because mental assessment requires mental fitness.

Past studies have analyzed prejudice stereotypes (Chen, Purdie-Vaughns, Phelan, Yu, & Yang, 2015) but not a stereotype related to mental versus physical fitness. Reports

have outlined the difficult problem of distributive justice and the many approaches to solving that problem, but not whether distributive justice is ethically impossible in what seems an unwinnable struggle facing the organ allocation industry (Center for Bioethics, 2004). Studies have argued that (by definition) mentally challenged humans who cannot navigate a world of rational choices are excluded from claiming those choices, but not whether there is a prejudice for mental fitness over biological viability (Fyson & Cromby, 2013). Studies have brought evidence of bias against the physically old despite a lifetime of service to society (Grams et al., 2012). Studies have brought evidence of bias against the physically young because of inadequate mental fitness—even though their whole life is ahead of them. Studies to date, however, do not seem to have sought evidence for bias during the difficult process of human assessment, indicative of an inadvertent circumvention of individual human rights. Surprisingly, despite astonishing advances in the areas of medicine and psychosocial assessment, natural (random) selection may turn out to be one of the few means (perhaps the only means) available to avoid assessment bias. This theme is further analyzed by covering topics such as the mentally unfit being neglected by a history of assessment, the struggle for distributive justice over random selection, and the irony of human rights over natural selection.

  Neglected by a history of assessment (preference for mental fitness). The separation of individuals into groups according to favored traits has a broad presence in history and literature (Adams et al., 2013). The criteria needed to determine these preferential distinctions has varied though, over the past 150 years (see Table 1). Less-favored groups have been persons of color, different appearance, different ancestry, or supposed inferior genetic origin (racism; Chen et al., 2015). Less-favored groups have

been persons of "primitive" or indigenous origin (usually the former owners of colonized lands; Moses & Stone, 2013; Wildcat, 2015). Less-favored groups have been equally advanced neighboring cultures seeking employment during lean years or seeking safety during regional conflicts (immigrants). Less-favored groups have been the same culture's women, children, and elderly (suffrage, ageism, and adultism). Less-favored groups have been those who were equivalent in every other way except by socioeconomic status (classism). The assessment of favored traits has excluded those of different faiths, persons of different sexual attraction/sexual identity, or those whose traits may be preferred during one era (in times of unusual need) and undesirable in another era (in times of plenty; Baker, 2017). Such groups have included domestic women and migratory workers normally excluded from working during times of plenty, but invited to work during times of need such as during global conflicts (Adams et al., 2013). A more recent favored trait (social productivity, employability) associated with discrimination of the less productive or the physically or mentally incapacitated has been termed ableism.

The new set of unfavored races seem to be the disabled (the physically aged and the mentally or physically impaired) because they are less employable and thus a societal burden (Baker, 2017). Ableism (the discrimination against those of lesser ability) includes those with both physical and mental handicaps. However, although the physically handicapped have enjoyed a degree of acceptance and compassion, those whom are mentally handicapped have been regarded with fear, avoidance, exclusion, and social derision (Fiske & North, 2014; Roberts, 2015). This differential view of physical and mental disability suggests group anger when the mental aspect is not in command of the physical aspect.

Table 1

Types of Assessment Bias

Bias	Assumption
Inheritance	Genetic superiority
Race	Favored races
Ethnicity	Favored groups
Gender	Inferiority, social role
Age	Physical/mental inferiority
Intelligence	Mental superiority
Disability	Social liability

Distributive justice over random selection. The problem of how to best decide an outcome by voting on the most desirable qualities is not new. The modern democratic election process for the best candidate began as a random election process in ancient Athens. Originally, the Greeks could not decide on a fair way to elect certain public officials, and decided that the best way was to draw the winner from a pool including every citizen's name, much as researchers select random samples from the general population (Barker, 2013; Bouricius, 2013). Although this was an unbiased way to decide, the winner might not be capable enough (politically competent enough) for the position, which is a problem known as *non-discriminatory selection*. Competence could not be known in advance, otherwise it would not be random; competence, however, is often needed to carry out the duties of the position of random representation, raising concerns regarding candidate bias. (This same dilemma seems it plagued the recent presidential election of 2016 too, with one candidate chosen by popular vote but

politically unqualified, and the other politically qualified but unselected by popular vote).

The limits of certainty in a system founded on the assumption (eventuality) of a logical

outcome have been questioned, for instance Gödel's incompleteness theorems, and the

paradoxical implications of candidate selection criteria (when the supply cannot keep up

with the demand) as in this study (Raatikainen, 2015).

There are some problems with random selection however. An organ lottery might

reduce the potential lack of representativeness of the population of interest, but even

sortition (casting lots) has its problems. Random sampling error applies to kidney organ

lotteries as well as a sample drawn from a population (Singh & Masuku, 2014). The

legitimacy of the outcome from random selection cannot be validated the way a consent-

based or elective system might contribute legitimacy, when the need for retrospective

certainty becomes salient (Burgers, 2016). Rodriguez & DeNardis (2011) argue that

random selection might solve Connecticut's education/financing impasse, but would

probably perturb many whose stake in the state's education dilemma would have no

greater influence than any other stakeholder. Even Broome's theory of fairness (the

weighting of lotteries by proportional equity, to avoid decisional bias) suggests a paradox

is possible unless every entry wins the lottery, thus requiring that Broome's fairness

solution (weighting) not be adopted (Kirkpatrick & Eastwood, 2015).

As far back in time as ancient Greece, it was realized that election criteria would

help guarantee competence—but at a cost of potential bias in that criteria. A random

selection process would be fairer—but then one could not know whether that individual

would be qualified. The process of assessing candidates to see which might be the best

recipient of a rare organ engenders the same dilemma. If the organ candidate were

randomly selected, the organ might not survive, but the transplant industry would escape these ethical criteria altogether. If the organ candidate were selected based on criteria regarding his or her competence to host the organ (as now), the transplant industry would be faced with accusations of bias during the selection (because of that criteria).

The ethics of organ transplantation are complicated (Center for Bioethics, 2004). The problem of how to divide insufficient resources fairly is called *distributive justice*. Unfortunately, although there are many ways, none of them seem able to approximate the idea of fairness. They can be divided: (a) equally (randomly), (b) according to need, (c) according to effort, (d) according to contribution, (e) according to merit, and (f) according to free-market exchanges. Worthiness may enter in (screening out those society feels do not deserve an organ), or maximum benefit (screening out those who might not maximize the benefit). Currently, each transplant center can set its own criteria— although most centers share some agreement as to absolute contraindicators, for example dementia, drug dependency, active psychotic symptoms such as schizophrenia, a history of non-adherence to treatment regimen, and the absence of a social support system (Maldonado et al., 2012).

According to peer-reviewed articles, questionnaires at transplant centers, and analyzed criteria, many centers view mental inferiority/instability as an absolute contraindication—because of worries of non-compliance with complicated self-care after surgery (Patzer, 2011). Persons of color, the poor, the illiterate, those whose parents are illiterate, the mentally infirm, those unlikely to follow physicians' orders without question, those who use tobacco, those who have misused substances, those who are very obese, and those who are beyond middle age are often screened out before being referred

to a transplant center for assessment (Patzer, 2011). As with Adorno's concept of an

apparent banality toward Life itself while making life and death decisions, these hard

decisions seem to say less about the kinds of people that make them, than the unnatural

need for otherwise sympathetic people to have to make them (Cohrs, Petzel, & Funke,

2012; Jetten & Mols, 2014; Newlands, 2014; Newman, 2014).

Human rights over natural selection. Representing the needs of the minority has

sometimes created a need to redefine which groups are covered by human rights.

Minorities of different color, different gender, uncertain gender, and various disabilities

have fostered the expansion of the definition, to include groups once excluded from

representation (Baynton, 2013). However, groups labeled with intellectual disability have

been faced with a dilemma—because (by definition) mentally challenged humans who

cannot navigate a world of rational choices are excluded from claiming those choices

(Baker, 2017; Fyson & Cromby, 2013). This conundrum is made plain in the Universal

Declaration of Human Rights, which states that "All human beings are born free and

equal in dignity and rights. They are endowed with reason and conscience and should act

towards one another in a spirit of brotherhood" (United Nations, 1948, para. 9). The

words reason and conscience, according to legal researchers, create criteria that

intellectually challenged groups would have difficulty meeting (Fyson & Cromby, 2013).

Historically, the mentally challenged have faced a future of exclusion and scorn by the

normative majority which place significant value on a superior intellect. The neoliberal

paradigm assumes that consumers of choices are capable of self-care. The inability to

care for themselves—in an intellectually oriented and economically oriented world—

rapidly marginalizes groups that are not only less able, but deemed a liability by a world

of swelling populations and dwindling resources. The process of allocating life-saving organs to worthy candidates seems to summarily screen out those who are incapable of self-care from the additional burden of taking care of the lifesaving organ (Ubel & Loewenstein, 1996). Though persons born with or faced with mental challenges did not choose to be poor, nor choose to be excluded from human rights and human relationships, the dominant human group does not let them choose whether or not they will survive when in need of a transplant, because they do not meet the criteria for being human (Fyson & Cromby, 2013; Hodson, MacInnis, et al., 2014).

These four themes argue for a comparison of groups of humans on the waiting list for a replacement kidney, to test whether some humans wait longer than others. This research study conducts that comparison. It asks whether those individuals who wait too long to survive possess certain unfavored traits—traits representative of inferior value in the competition for scarce kidneys.

Methodology literature. This study used ANOVA to test for bias. The ANOVA has been used recently and efficiently to evaluate and estimate concepts such as prejudice and consumer liking behavior (Costarelli & Gerłowska, 2015; Norton, Frost, & Ariely, 2013). Interactions between physical and mental fitness could be and were analyzed well using a factorial ANOVA which was used in this study (Costarelli & Gerłowska, 2015). Grams et al. (2012) used the USRDS data to study the survivability of physically older adults (65 and older) who were not selected in time for transplant, and found their graft outcomes were equivalent to those who had received a transplant in time. The authors did not, however, compare this physically older group to the mentally challenged younger group, nor compare both groups to the middle group between 18 and 64 (the just right

group). Wightman et al. (2014) used the USRDS data to study the survivability of children under 18 with intellectual disabilities who were not selected in time for transplant, and found their graft outcomes were equivalent to those of the same age group who had received a transplant (because they did not have an intellectual disability). The authors did not, however, study whether this finding was part of an overall selection prejudice representative of a bias against candidates whose mental and physical age were not "just right."

Curtis (2006) studied the paradoxical ethics of a diverging need for more stringent medical and psychosocial criteria (because of a stable supply of viable organs) in light of a burgeoning elderly population in need of less stringent criteria (and far more organs). The author did not, however, ask whether the lifetime of service to society by this "baby boomer" generation was being neglected to better represent the public interest—by allocating scarce organs to those who had never served society in the past, but were of far more value to society in the future. The practicality of favoring pre-industrial youth to best host the longest survival of rare organs is evidenced by a change in policy for these industries in 2014 (Chopra & Sureshkumar, 2015). Derrington et al. (2016) analyzed the ethical problems associated with screening out children (and their families) from access to vital health solutions such as kidney transplantation on the basis of mental (psychosocial) criteria, and asked for a non-utilitarian option to transplant policy. However, the authors did not combine the evidence of ageism bias (screening out the physically unfit) with ableism bias (screening out the mentally unfit) to ask whether a physically viable child and his or her family were being told by society that he or she would face a lifetime of exclusion and premature death. The authors did not ask whether

the well-meaning industries of selection and allocation, to best represent the public interest, had inadvertently assessed the mental ages of some human beings as insufficient to follow complex individual medical regimen, and indirectly violated the same principles about individuals they sought to uphold (Ubel & Loewenstein, 1996).

This research study has asked and answered all of these questions. This research posited that some groups of humans are favored to receive the best medical coverage, despite the right of every human being to equal access to humane treatment. This right is guaranteed by the Universal Declaration of Human Rights (United Nations, 1948).

Instrumentation literature. This study did not use an instrument because the data had already been collected and was already available. This research used the OPTN portion of the U.S. Renal Data System (USRDS) to collect existing observations of transplant candidate applications and outcomes. The USRDS has been used as a data collection source in recent studies, for example to see whether a diagnosis of serious mental illness should be a contraindicator for transplant candidates (Evans et al., 2015). One of the co-authors of that study was also contacted regarding this technique (S. B. Morissette, personal communication, December 5, 2016).

Other methods have been used as well. Questionnaires with Likert-scale items have been frequently used in the study of prejudice, including predominant models of prejudice such as the SCM (Fiske & North, 2014). These have consisted of five or seven response options from "not at all" to "extremely," although the number of options (and whether a neutral option is offered) have varied from study to study. Examples are the stereotype content model (SCM), Symbolic Racism Scale (SRS), the Modern Sexism Scale (MSS), the Neosexism Scale (NSS), Ambivalent Sexism Inventory (ASI), Fraboni

Scale of Ageism (FSA), and the Succession, Identity, and Consumption Scale of Prescriptive Ageism (SIC). The survey respondent is presented with a hypothetical situation or an attitudinal opinion, and responds along an intensity scale of lesser to greater agreement. These are frequently analyzed using chi-square analysis when the questions request qualitative rather than quantitative responses (such as participant preferences rather than physical attributes).

Questionnaires are not the only means of measuring prejudice however, and Likert-scale items are not always the preferred method of indicating responses. The Implicit Association Task (IAT) and Indirect Priming Measure of Racism (IPMR) rely upon subliminal suggestion or priming to gather implicit rather than explicit responses, usually by presenting both images and text prompts. The IAT has been challenged on a number of aspects, one being the need for conscious association even if the instrument is based on nonconscious association. However, it has also evidenced response components not available in questionnaires alone, such as physiological responses and visceral certainty (Fiske & North, 2014; Nascimento, Limeira, de Pinho, & Santa Rosa, 2014). Another technique is the feelings thermometer rather than a Likert-scale item, which has shown both validity and greater ease of use, along with caveats about the need for more explanation than a questionnaire (Liu & Wang, 2015).

This research did not need survey instruments, however. This research study collected observations from a secondary data source, the U.S. Renal Data System (USRDS), which contains candidate data previously collected using various official survey instruments. The USRDS has been used recently as a data collection source for similar studies. One such study by Ling-Xin et al. (2017) collected data from the USRDS

to analyze waitlisted versus transplanted candidates to help identify criteria within the oldest age group associated with better kidney transplantation outcomes. The present research study also used the USRDS to gather waitlist data regarding the oldest age group. Another study by Wightman & Freeman (2016) collected data from the USRDS to analyze the ethics of pediatric dialysis (the youngest age group), considering their age, family impact, economic resources, and ongoing moral controversies. The present research study also used the USRDS to analyze the youngest age group and the ethics associated with their presence or absence in kidney transplant selection (which procedure always follows pediatric renal illness/dialysis as soon as possible). The USRDS was used by Evans et al. (2015) and Wightman et al. (2014) to evaluate whether mental illness should be a contraindicator for transplant candidates. The present research study also used the USRDS to evaluate whether mentally impaired groups waited longer to receive a kidney (had been assessed and contraindicated for transplant due to intellectual impairment/disability).

Summary

The purpose of this chapter was to thoroughly present the background needed to understand the evolution of peer-reviewed psychological research which led to the identification of a research gap. The background of the problem is that is that there seems no ethical way to allocate too little to too many. There are far more persons who need an organ than available organs (Patzer, 2011). This has resulted in the need for medical professionals to use criteria to help decide who lives and who dies. Those who are refused an organ will feel unfairly treated by society (Fyson & Cromby, 2013). The ethics of this dilemma are called distributive justice. The evolution of models of prejudice up to

the current model may be summarized by three perspectives: (a) human v. human prejudice, (b) human v. non-human prejudice, and (c) human enough v. not human enough prejudice. However, the hallmark of each of these models has been a distinction between what is held to be superior versus what is held to be inferior—even when each side of the same distinction is said to belong to the same species or the same category. This dissertation's model of class prejudice has argued that mental fitness is held to be superior to simply being physically alive, with the former (an individual's mental capacity) often assessed to determine access to intimacy and group membership, and even to continued individual survival.

The theoretical model upon which this research was based is called the stereotype content model (prejudice based on value to society). Just as social status can be plotted in one of the four quadrants of the stereotype content model of prejudice, kidney organ candidate wait time can also be plotted in those same quadrants. This alignment permits a similar model proposed by this study called the intellectual stereotype model or ISM (see Figure 6 in Appendix H). Mental favoritism (versus biological favoritism) fits the same two axes (competence versus warmth) and also aligns with the same odd blends of public opinion (endearing but inferior) coinciding with the allocation of kidneys and selection of candidates (Ubel & Loewenstein, 1996).

The review of the literature was divided into four themes to make it easier to become acquainted with the literature underpinning this research. These themes were: (a) the problem (organ allocation), (b) the prejudice (physical/mental age), (c) the past (candidate assessment), and (d) the premise itself (assessment bias). The problem was that there are far more persons in need of a replacement organ than there are organs,

which creates an organ allocation ethics dilemma. The prejudice was a bias for combined fitness (a combination of physical and mental ability), to solve the problem of too many people and not enough organs. The past has seen the use of psychological assessments dating back to ancient China to help decide which persons receive special treatment when there are more persons in need of a resource or social position than there are resources or social positions. These assessments have excluded candidates on the basis of undesirable traits, creating questions about the ethics of selection. The history of grafting itself has also been questioned regarding its ethicality, while the mental health professions have argued for greater inclusion in the selection process. The premise was that the psychosocial and commercial criteria used to screen candidates for kidney transplantation exhibit a bias for superior mental candidates, and are biased against less mentally competent groups. This is mainly because mental assessment requires mental fitness, and the complex caretaking of a transplanted organ to safeguard its continued survival requires considerable mental capacity. Issues of the inadvertent violation of human rights during the decision-making process suggest that random selection may be one of the few means of avoiding selection bias.

Lastly, a section was presented regarding relevant methods employed to investigate these concepts, and the relevant instrumentation used by researchers to help reveal and measure these concepts. The content and arguments presented express a depth of substance in extant literature supporting the viability of exploring this gap in the research. This gap suggested that mental fitness has been frequently preferred over physical fitness in the application of distributive justice. Among the natural sciences, such a preference is called *unnatural selection*, whereas the absence of psychosocial

criteria may be a return to a natural wisdom of candidate selection, and offer a form of

distributive justice less prone to the violation of human rights.

Chapter 3: Methodology

Introduction

End stage renal disease (ESRD) is a terminal illness which results in physical and mental death (Center for Bioethics, 2004). In an effort to solve this dilemma and defer death, living organs (kidneys) are removed from living and deceased persons and transplanted into select candidates—as a temporary solution. Without a timely kidney transplant, the inevitable result is hemodialysis and death (Patzer, 2011). Unfortunately, the number of candidates in need of kidneys vastly exceeds the number of viable organs, and the demand for organs continues to grow faster than the organ donor supply. Persons with ESRD are placed on a waiting list, and the length of time on that list is the primary predictor of their premature death (Center for Bioethics, 2004; Patzer, 2011).

In an effort to solve this dilemma and defer death, physical and mental criteria are used to rank the vast waiting list of hopeful candidates and thus choose only the best candidates for receipt of the timeliest transplant. Unfortunately, the outcome of this effort is another dilemma. Many groups claim the industry of kidney organ assessment practices bias in the selection of survivors—inadvertently violating human rights policies by delaying the date of transplant of less desirable groups (Danovitch, 2014; Reese et al., 2015). The average wait time for a kidney has been about five years (10 in many states), whereas the average length of survival on dialysis is less than five years—therefore groups that are delayed face unusually high risks compared to the norm (Grubbs et al., 2014). Studies like Grams et al. (2012) and Curtis (2006) have shown that there is a bias against more advanced physical age in the selection of older candidates—despite the mental fitness of the transplant candidate (ageism). Studies like Wightman et al. (2014)

and Derrington et al. (2016) have also shown that there is a bias against less advanced mental age in the selection of younger candidates—despite the physical fitness of the transplant candidate (ableism). A survey of the literature suggested that the impact of assessment bias on how much longer these two groups wait for a kidney may not have been researched, with respect to an inadvertent preference for the survival of something other than the large numbers of living candidates in need of an organ (Kivnick & Wells, 2014; Stone et al., 2013). A survey of secondary data in the U.S. Renal Data System allowed the comparison of these two groups against the average group by analyzing mean wait times for kidney transplant across physical age and mental age groups (Grams et al., 2012). This comparison allowed the potential identification of favored traits during the candidate selection process (to prolong the physical and mental survival of certain candidates), despite international policies governing the right to life for all human beings regardless of favored traits (Danovitch, 2014; Reese et al., 2015).

This chapter was organized into a problem statement, a set of research questions, the design and methodology used to explore and test those questions, the population of study, and a representative sample. Following this introduction, the study instrument (source of data) is described, as well as a discussion of validity and reliability, how data were gathered and analyzed, and the ethical considerations, limitations, and delimitations involved in carrying out the study. A summary concludes the chapter.

Statement of the Problem

It was not known if some groups such as older candidates (those who were physically unfit but mentally fit) and younger candidates (those who were mentally unfit but physically fit), waited longer to receive a kidney due to a physical or mental

assessment bias. This was an important research question because a survey of the literature suggested that physical age and intellectual disability were being discriminated against in the process of screening and wait-listing candidates for life-saving kidney transplants (Cherkassky, 2011; Derrington et al., 2016). The delays experienced by the elderly (ageism) and by young people with special needs (ableism) could mean that inferior groups did not have an equal chance to survive end stage renal disease (Curtis, 2006; Derrington et al., 2016; Grams et al., 2012; Wightman et al., 2014).

The significance of this problem was that the number of candidates in need of organ donations is growing faster than the number of available healthy organs, resulting in a growing need for the transplant industry to favor some human traits over others (Center for Bioethics, 2004; Patzer, 2011). This problem has in turn resulted in a proliferation of ethical dilemmas while trying to find a standard set of disqualifying criteria (Ubel & Loewenstein, 1996). The search for a standard for the ethics of organ transplantation has evinced how challenging and complicated such a goal is—even for experts across multiple disciplines (Center for Bioethics, 2004). The problem of how to divide insufficient resources fairly is called *distributive justice*. Unfortunately, although there are several ways (equally, or according to need, effort, contribution, economic exchange, or merit), none of them seem able to approximate the idea of fairness (Center for Bioethics, 2004). Society may decide to screen out those it feels do not deserve an organ, even if they need one (a concept called *worthiness*). Society may alternatively decide to screen out those it feels might not represent the most efficient use of a scarce commodity (a concept called *maximum benefit*).

Currently, each transplant center can set its own criteria, although most centers share some agreement as to absolute contraindicators (Maldonado et al., 2012). These include dementia, drug dependency, active psychotic symptoms such as schizophrenia, a history of non-adherence to treatment regimen, and the absence of a social support system (Maldonado et al., 2012). Even so, the need to discover a standard set of ethical criteria has also raised the possibility of violations of human rights (social justice) with respect to protected groups—for instance increasing numbers of special needs youth and the growing elderly population (Danovitch, 2014; Reese et al., 2015).

Research Questions and Hypotheses

The purpose of this research was to compare groups of candidates on the waiting list for a kidney transplant in the U.S. Renal Data System (USRDS), to test whether some groups such as older candidates (those who were physically unfit but mentally fit) and younger candidates (those who were mentally unfit but physically fit), waited longer to receive a kidney due to a physical or mental assessment bias. These questions asked which group (physically robust candidates or mentally robust candidates) was more likely to receive scarce kidney organs (Cherkassky, 2011). Data were collected from the U.S. Renal Data System (USRDS). The range of data collected consisted of human participants on the OPTN waiting list for kidney organ transplantation between January 1, 2014 to December 31, 2014 and included both first-time kidney transplant candidates and recipients[1]. These were grouped into three age groups (under 18, between 18 and 64, and 65 and over). These ranges were chosen to align this research with previous research in which physical age bias was found (Grams et al., 2012).

The data source was the Organ Procurement and Transplantation Network (OPTN) registration data publicly available from the U.S. Renal Data System (USRDS). The USRDS is "a national data system that collects, analyzes, and distributes information about chronic kidney disease (CKD) and end-stage renal disease (ESRD) in the United States" (U.S. Renal Data System, 2017, para. 1). This database is in the public domain and affords researchers an opportunity to analyze national organ transplant data. This includes details about applicants for organ transplants versus eventual recipients of organ transplants. Three questions were used to query the database. These three questions were operationalized in the following.

RQ1: Do candidates whose physical age is too young or too old have significantly longer transplant wait times compared to those who are just right?

$H1_0$: Candidates whose physical age is too young or too old do not have significantly longer transplant wait times compared to those who are just right.

$H1_A$: Candidates whose physical age is too young or too old do have significantly longer transplant wait times compared to those who are just right.

RQ2: Do candidates whose mental age is too slow or somewhat slow have significantly longer transplant wait times compared to those who are just right?

$H2_0$: Candidates whose mental age is too slow or somewhat slow do not have significantly longer transplant wait times compared to those who are just right.

$H2_A$: Candidates whose mental age is too slow or somewhat slow do have significantly longer transplant wait times compared to those who are just right.

RQ3: Do physical age and mental age interact to predict significantly longer transplant wait times?

H3₀: Physical age and mental age do not interact to predict significantly longer transplant wait times.

H3_A: Physical age and mental age do interact to predict significantly longer transplant wait times.

Independent and Dependent Variables

IV1: Physical age. This independent variable was a categorical variable representing the chronological age of a candidate regardless of greater overall physical/mental ability than the chronological age suggests. Following a study by Grams et al. (2012) but rephrasing for the purposes of this dissertation, the researcher divided physical age into three chronological age groups equivalent to prior Medicare physical age bias studies (Grams et al., 2012; U.S. Renal Data System, 1992; Wightman et al., 2014). These corresponded to: the group of normatively unemancipated youth under 18 (too young), the group of normatively retired seniors over 64 (too old), and the normatively productive age group between 18 and 64 (just right). These categories allowed the comparison of physical age groups based on criteria that seemed to divide human chronological age according to a physical bias, wherein 18 to 64 (the just right group) seemed to be the just right group (Grams et al., 2012; Wightman et al., 2014). The renal database follows this format as well (U.S. Renal Data System, 2015b).

IV2: Mental age. This independent variable was a categorical variable representing the mentally assessed age of a candidate regardless of greater overall physical/mental ability than the mental age suggests. Following a detailed study by

Wightman et al. (2014) but rephrasing for the purposes of this dissertation, the researcher

divided mental age into three levels of increasing intellectual ability equivalent to prior

intellectual development bias studies of the USRDS. These corresponded to: the group

that is assessed in the system as incapable of self-care (too slow), the group that is

capable of self-care but requires additional help (somewhat slow), and the group that is

fully capable of self-care (just right; U.S. Renal Data System, 2015b; Wightman et al.,

2014). These distinctions accorded with existing categories in the USRDS, the criteria

regarding the predictability of a candidate's ability to host a replacement kidney, and

detailed studies of special needs youth representation in the USRDS (Wightman et al.,

2014). These categories allowed the comparison of mental age groups based on criteria

that seem to divide human developmental age (mental age relative to physical age) with a

bias toward mental fitness, wherein the ability for self-care (absence of

intellectual/developmental delay) is considered superior. The renal database follows this

format as well.

DV: Transplant wait time. The dependent variable was a continuous variable. It

represented the length of time in days that a candidate with the specified criteria had

waited on the waiting list to receive a kidney organ transplant. This time was calculated

as the difference between reaching the waiting list and receiving a transplant.

The rationale for these questions was that there was a limited supply of donated

organs but a larger number of living individuals in need of an organ to continue living.

The need to decide who received an organ and who did not, required health screening of

recipients (Petrini, 2012). Since assessments used to screen candidates included both

physical decline (physical feebleness/chronological age) and mental impairment (mental

feebleness/chronological age), it was possible that some groups waited longer to receive a kidney due to a physical or mental assessment bias. Those who were younger than the just right group but seemed unlikely to acquire adequate mental fitness, and those beyond the just right group and unlikely to acquire adequate physical fitness, seemed to be less favored for continued life—even if "all human beings are born free and equal in dignity and rights" (United Nations, 1948, para. 9).

Studies have sought the presence of ageism bias against candidates 65 and over in the USRDS database (an assessment of physical feebleness despite physical robustness; Grams et al., 2012). Studies have also sought ableism bias against candidates under 18 with intellectual disability in the USRDS database (an assessment of mental feebleness despite physical robustness; Wightman et al., 2014). Though these assessment biases have been studied, a comparison of certain groups such as older candidates (those who were physically unfit but mentally fit) and younger candidates (those who were mentally unfit but physically fit), might have been an indicator that some groups waited significantly longer to receive a kidney, and thus perished because they were indirectly neglected by assessment.

Research Methodology

There were two primary types of research methodology available to choose from to conduct this research, qualitative and quantitative. A qualitative or mixed method would be appropriate if the purpose of the research were to observe and explore populations under natural conditions, resulting in rich descriptions rather than numerical data (Park & Park, 2016). A quantitative method would be appropriate if the purpose of the research were to predict, uncover, or control phenomena, for instance to analyze

measurements in numerical form taken from an existing population (Park & Park, 2016). As the purpose of this research was to analyze measurements taken from an existing population (potential recipients of kidney organs), this study used a quantitative method to gather and analyze the numerical data. These measurements were queried from existing, secondary data sets which already contained the desired data, and already in a form suitable for after-the-fact (causal-comparative), quantitative analysis.

Research Design

There were five primary kinds of quantitative research designs available to choose from to conduct this research. These were descriptive, correlational, experimental, quasi-experimental, and causal-comparative (Johnson, 2001). A descriptive design would be used to observe and describe behaviors. A correlational design would be used to look for an association between two or more variables, but could not state that one variable caused the other to change. An experimental design would be used to determine causality, for example to demonstrate that one variable caused another variable to change. A quasi-experimental design would be used in place of an experimental design if the researcher could not randomly assign participants to groups (Johnson, 2001). A causal-comparative design would be used after the fact (*ex post facto*) if the conditions already existed, and therefore the treatment variable could not be manipulated.

This research used a causal-comparative design because the data for this research consisted of secondary data in national repositories of organ transplant data which had already been collected (*ex post facto*). As a result, the principal investigator could not manipulate the physical and mental conditions present in the fixed data (Bleske-Rechek

et al., 2015; Ejima et al., 2016). This research design was used recently to analyze data such as the presence of mental illness in fixed data (Riemersma et al., 2015).

Each of the independent variables (physical age and mental age) were categorical, and the dependent variable (transplant wait time) was continuous. Following a study by Grams et al. (2012), the researcher divided physical age into three chronological age groups equivalent to prior Medicare physical age bias studies (Grams et al., 2012; U.S. Renal Data System, 1992; Wightman et al., 2014). These corresponded to: the group of normatively unemancipated youth under 18 (too young), the group of normatively retired seniors over 64 (too old), and the normatively employed age group between 18 and 64 (just right). Following a detailed study by Wightman et al. (2014), the researcher divided mental age into three levels of increasing intellectual ability equivalent to prior intellectual development bias studies of the USRDS (Derrington et al., 2016; Wightman et al., 2014). These corresponded to: the group that is assessed in the healthcare system as incapable of self-care (too slow), the group that is capable of self-care but requires additional help (somewhat slow), and the group that is fully capable of self-care (just right). These distinctions accorded with existing categories in the USRDS and detailed studies such as Wightman et al. (2014). These variables and their levels fulfilled the requirements for factorial ANOVA. The factorial ANOVA method was chosen because this study used a statistical test with two categorical independent variables, one continuous dependent variable, and a between-subjects design (Morgan, Leech, Gloeckner, & Barrett, 2013).

Population and Sample Selection

The population consisted of human participants with end stage renal disease (ESRD) in need of a replacement kidney. The target population consisted of human participants on the kidney transplant waiting list. The sample consisted of human participants listed as active on the OPTN waiting list for kidney organ transplantation between January 1, 2014 to December 31, 2014 and included both first-time kidney transplant candidates and recipients. This study limited the sample to first-time recipients because some individuals received subsequent transplants as well, but were not included since that might confound the reason for their selection. These were grouped into three age groups (under 18, between 18 and 64, and 65 and over). These ranges were chosen to align this research with previous research in which physical age bias was found (Grams et al., 2012). The data were requested using the non-sensitive data request format at the USRDS and participants were not identifiable by the data requested (see Appendix E).

Since the sample was to be analyzed using a 3 x 3 ANOVA (a between groups factorial ANOVA), nine cells were needed. The nine cells were the three possible age groups (too young, too old, and just right, corresponding to under 18, over 64, and the age group between 18 and 65), with three levels each for possible intellectual disability (see the Research Model in Figure 5 in Appendix G). Sample size for this type of design was calculated using power analysis, with G*Power 3.1.9.2 for Windows (Button et al., 2013). The effect size was set to a medium effect size convention set by Cohen for this type of test, which was .25 (Faul, Erdfelder, Buchner, & Lang, 2009). The alpha error probability was set to a standard of 0.05, with a corresponding power of 95%. The numerator *df* (degrees of freedom) were set to 2 (for a main effect) and the number of

groups were set to 9. These settings indicated a minimum sample size of 251 (total) or

27.88 per cell for nine cells. This total was rounded up so that each of the nine cells (each

of the three levels of the three factors), would come out evenly, which was 252 in total

and 28 per cell. Since the data were official, preexisting data, no random assignment to

these groups were involved. The number per cell could not be precisely known in

advance of the request for data, but was assumed to be more than required by this cell

size, based on estimates from annual data reports published by the USRDS. This could

have amounted to approximately 66,000 (7,333 per cell) for the average largest group

possible for the sample period of January 1, 2014 to December 31, 2014. The data were

made public by the USRDS and did not require special authorization for data unless

connectable to individuals, however application for authorization was made using the

website form at the USRDS to fulfill this part of the research. Provisional permission was

granted by the project manager at the USRDS, and full permission was granted by

approval of the program director at the NIDDK (see Appendix D). The data were public;

however, confidentiality was maintained by securing all collected research data on a

password protected computer. The geographic area covered by the secondary data was

the United States only.

Sources of Data

All data were drawn directly from the U.S. Renal Data System, which was the

only official repository of data kept regarding kidney organ candidates, donors, and

outcomes. The validity and reliability of this data met compliance with federal, state, and

local guidelines for the recording and documenting of conditions such as end stage renal

disease, also known as ESRD (ESRD Surveyor Training Interpretive Guidance, 2008;

U.S. Renal Data System, 2016). Annual reports described the maintenance and standards of this system, and the validity of its web-based systems which were available to researchers. This use was authorized for purposes described as "to create core metrics and measures, such as the assessment and reporting of provider performance" (U.S. Renal Data System, 2015a, para. 2). The secondary data in the USRDS were gathered during candidate registration and not by the researcher, for example physical age, physical debility, and mental impairment at the time of assessment and transplant. This official data represented categorical and numerical data subsequently transcribed into official databases, the group means of which could be analyzed by researchers for potential relationships.

Validity

The validity of a test is its ability to show that it is measuring what it says it is measuring, and that those measurements can be trusted (Yaremko, Harari, Harrison, & Lynn, 2013). The validity of these measurements may concern internal or external validity. Internal validity concerns how true an observation or test might be within its experimental limits, whereas external validity concerns how generally a claim might be applied outside its experimental limits (Fowler, 2013). Construct validity is also important, and represents how well a test can measure what it claims to measure (Fowler, 2013).

The data sources from which this research study collected its observations were as valid as they and the community they serve could gather and verify for these crucial physical and psychological observations. That community included the medical personnel, administrative personnel, organ donors, and recipients of transplanted organs

(U.S. Renal Data System, 2016). Data from the USRDS and tentative conclusions drawn from that data exhibited both confidence and caution within the nephrology community, and its primary strengths were size and representativeness (Foley & Collins, 2013). The USRDS is the sole repository for the recording of statistical physical and mental information about all known U.S. patients treated for end stage renal disease (ESRD).

Its limitations were that it continues to be difficult to validate the methods by which the data are recorded, to include ancillary conditions or lab data when the patients are registered, or directly report whether survival bias is present in the end stage renal disease treatment community (Foley & Collins, 2013). A systematic review of existing datasets suggested considerable variability when attributing the primary cause of death, with 31% agreement between sources, and a *kappa* of 0.24 (Grams et al., 2011). However, the review also concluded these percentages were likely due to the need to classify patient cause of death for initial claims purposes, misattributing the primary condition with comorbidities not covered by the claims directly. Although the primary cause of death might be less certain, the dates of induction onto the waiting list, wait time between induction and receipt of a kidney, and assessment of physical and mental fitness to receive a kidney contained little variability, varying within 97% of each other (see Table 2). With these limitations in mind, the researcher also compared the totals and means from the annual reports used by the renal community to the data collected specifically for this study, to minimize any inaccuracy of their interpretation (Foley & Collins, 2013).

Reliability

The term reliability refers to a test's ability to obtain consistent responses each time it is taken (Yaremko et al., 2013). A key concern when assessing patients in life or death situations such as the screening of organ transplant recipients, is interrater reliability. Interrater reliability refers to the degree of agreement between different experts regarding the same observation (Smith, 2013). Agreeing on observations which might involve individual bias—when the scarcity of something needed for survival is at stake—raises fundamental moral issues (Rogge & Kittel, 2016; Tong et al., 2010).

The secondary data sources from which this research study collected its observations contained data which had been carefully gathered, entered, and checked for consistency (U.S. Renal Data System, 2015a). Crucial patient data were collected at the time of service both for medical needs and insurance claims coverage, using forms completed by professional personnel and some self-reported questionnaires. This was needed both to facilitate making expert medical decisions, and to comply with the need to account for the costs of these medical procedures.

The reliability and completeness of the USRDS data has been studied and shown to be reliable against regional datasets such as Michigan's kidney registry (U.S. Renal Data System, 1992). The treatment data agreed within 87.2% to 93.2%. The primary deviations from the two means of gathering patient and candidate data, were shown to be related to items of mostly national concern (Medicare) versus regional concern (the Michigan Kidney Registry). This was expected given the differing mission and goals of these programs. Tests for consistency and reproducibility showed some caution should be involved in interpreting the data as completely independent. However, an annual report

described these minor deviations as validating these are different sources with national

versus regional needs, suggesting significant consistency and sufficient reliability

provided these limitations are accounted for (Grams et al., 2011; U.S. Renal Data System,

1992).

Data Collection and Management

Data were obtained from a secondary data source. The OPTN portion of the

USRDS database was identified as a good repository of the data needed for this study,

because all organ transplants conducted in the U.S. must report candidate and recipient

data to these organizations (Saran et al., 2017). The data were available for researchers to

make requests from without special permission, so long as no patient-identifiable data

were gathered (no patient-identifiable data were gathered). A written request delineating

the desired data fields and dates and the purpose of the request was submitted to the

USRDS. Provisional permission was granted by the USRDS project manager followed by

full approval by the program director at the NIDDK (see Appendix D). The request

specified only the data needed to identify the active candidates for kidney transplantation

for the period between January 1, 2014 to December 31, 2014, and included both first-

time kidney transplant candidates and recipients[1].

These were grouped into three age groups (under 18, between 18 and 64, and 65

and over). These ranges were chosen to align this research with previous research in

which physical age bias was found (Grams et al., 2012). Field data were gathered as

described in Wightman et al. (2014) and the Researcher's Guide to the USRDS Database

(U.S. Renal Data System, 2015b). Database fields for inclusion were identified as age at

intake (to the waiting list), age at transplant (as appropriate), cognitive development,

academic progress, and academic level. Academic progress and academic level were included because the study by Wightman et al. (2014) used these specific fields for their study on intellectual disability (academic progress was also a measure of developed intelligence for school-age children). These corresponded to: the group that was assessed in the system as incapable of self-care (too slow), the group that was capable of self-care but required additional help (somewhat slow), and the group that was fully capable of self-care (just right). These distinctions accorded with existing categories in the USRDS and detailed studies of special needs youth representation in the USRDS (Wightman et al., 2014).

Prior to the actual study, the study design was submitted to the IRB. Standards of human participants research were followed for the protection and well-being of participants, as well as the respect of their privacy. These standards included respect for persons, beneficence, and justice, which were applied by assessing risk versus benefit, and ensuring the data did not take advantage of protected groups (U.S. Department of Health and Human Services, 2016). As the data were secondary and no patient-identifiable data were requested, application for exempt review was sought and approved (see Appendix A). Also in accordance with these principles, data were kept by the principal investigator only, and secured so as not to compromise anonymity of participants. Only the data needed for the design were gathered, in keeping with best practices. Upon completion of the study, data will be stored and encrypted on a password-protected computer for a period of three years maximum—per the research standards of the American Psychological Association (Devereaux & Gottlieb, 2012). After this period, all copies of the data will be wiped (erased and scrambled) so as to be

unrecoverable. The timeline for these data gathering procedures did not extend beyond the period approved by the IRB. The availability, privacy, and protection of any data collected will continue for a maximum of three years beyond which digital data will be electronically wiped and physical data shredded to protect participants, unless approved for retention (FDA Protection of Human Subjects, 2009).

Data Analysis Procedures

The data collected from the USRDS were analyzed using descriptive statistics and then using inferential statistics. The results are summarized in tables and figures. The assumptions, research questions, hypotheses, and variables used are relisted in the following.

The first research question, hypotheses, and variables tested whether the waiting list exhibited any physical age bias (ageism) within the sample population. Such a bias might indicate bias in the criteria. The research question and hypotheses were stated this way:

RQ1:   Do candidates whose physical age is too young or too old have significantly longer transplant wait times compared to those who are just right?

$H1_0$:   Candidates whose physical age is too young or too old do not have significantly longer transplant wait times compared to those who are just right.

$H1_A$:   Candidates whose physical age is too young or too old do have significantly longer transplant wait times compared to those who are just right.

The independent variable used to help answer this question was physical age. This was a categorical variable representing the chronological age of a candidate regardless of greater overall physical/mental ability than the chronological age suggests. The

researcher divided physical age into three chronological age groups equivalent to prior

Medicare physical age bias studies. These corresponded to: the group of normatively

unemancipated youth under 18 (too young), the group of normatively retired seniors over

64 (too old), and the normatively employed age group between 18 and 64 (just right).

These categories allowed the comparison of physical age groups based on criteria that

seemed to divide human chronological age according to certain ages, wherein 18 to 64 is

typically considered just right. The dependent variable used to answer this question was

transplant wait time, a continuous variable representing the length of time in days that a

candidate with the specified criteria had waited on the waiting list to receive a kidney

organ transplant.

Initially, data were analyzed using a 3 x 3 between groups factorial ANOVA

using IBM© SPSS® version 24. The assumptions for a factorial ANOVA included that the

two independent variables (IVs) were categorical (they were), the dependent variable was

continuous (it was), and that the observations for the IVs were independent of one

another (they were). Further assumptions were that the observations exhibited

homogeneity of variance (they did not, see Table 9), that the dependent variable was

normally distributed (it was, see Figure 8 and Figure 9 in Appendix I), and that there

were no significant outliers (there were none, see Figure 7 in Appendix I). After attempts

to balance cell sizes did not reduce heterogeneity of variance, the researcher followed

advice to substitute the Welch ANOVA in case the lack of homogeneity might result in

questionable significance. Peer-reviewed sources argued for the use of Welch ANOVA as

a substitute in these cases, because ANOVA may produce Type I errors that are overly

conservative with large sample sizes or liberal with small sample sizes (Delello,

Reichard, & Mokhtari, 2016; Moder, 2010). When a Welch ANOVA is used, the same

sources advised following it with a Games-Howell *post hoc* which is more appropriate

than Tukey's and other *post hoc* comparisons for the same reasons (Rodríguez, Santana,

& Expósito, 2017). This approach was taken.

A Welch ANOVA using a statistical significance of $p < .05$ was used to determine

if there were a significant difference between physical age groups. As significance was

found, Games-Howell *post hoc* comparisons were used to compare differences between

the levels of the groups depending on the length of time candidates had to wait for a

replacement kidney. Those comparisons helped identify the group differences.

The second research question, hypotheses, and variables tested whether the

waiting list exhibited any mental age bias (ableism) within the sample population. Such a

bias might indicate bias in the criteria. The research question and hypotheses were stated

this way:

RQ2: Do candidates whose mental age is too slow or somewhat slow have

significantly longer transplant wait times compared to those who are just

right?

$H2_0$: Candidates whose mental age is too slow or somewhat slow do not have

significantly longer transplant wait times compared to those who are just right.

$H2_A$: Candidates whose mental age is too slow or somewhat slow do have

significantly longer transplant wait times compared to those who are just right.

The independent variable used to help answer this question was mental age. This

was a categorical variable representing the assessed mental age of a candidate regardless

of greater overall physical/mental ability than the mental age suggested. The researcher

divided mental age into three levels of increasing intellectual ability equivalent to prior intellectual development bias studies of the USRDS. These corresponded to: the group assessed as incapable of self-care (too slow), the group assessed as capable of self-care but requiring additional help (somewhat slow), and the group assessed as fully capable of self-care (just right). These categories allowed the comparison of mental age groups based on criteria that seemed to typically divide human developmental age (mental age relative to physical age) with a bias toward mental fitness, wherein the ability for self-care (absence of intellectual/developmental delay) seemed to be a superior trait. The dependent variable used to answer this question was transplant wait time, a continuous variable representing the length of time in days that a candidate with the specified criteria had waited on the waiting list to receive a kidney organ transplant. A Welch ANOVA using a statistical significance of $p < .05$ was used to determine if there were a significant difference between mental age groups. As significance was found, Games-Howell *post hoc* tests were used to compare differences between the levels of the groups depending on the length of time candidates had to wait for a replacement kidney.

The third research question, hypotheses, and variables tested whether the waiting list exhibited any interactions between physical age and mental age within the sample population. Such a bias might indicate mental favoritism in the criteria. The research question and hypotheses were stated this way:

RQ3: Do physical age and mental age interact to predict significantly longer transplant wait times?

$H3_0$: Physical age and mental age do not interact to predict significantly longer transplant wait times.

H3$_A$: Physical age and mental age do interact to predict significantly longer

transplant wait times.

This third test for an interaction was tested by combining the transplant outcomes into four logical categories, representing a "truth table" given two dichotomous factors (mental or physical, transplant or no transplant). This allowed a third one-way Welch ANOVA using a statistical significance of $p < .05$ to be performed to look for an interaction, followed by a Games-Howell *post hoc* as before. The independent was labeled transplant fitness and the four levels were labeled physical quotient high and low, and intelligence quotient high and low (PQ-Hi, PQ-Lo, IQ-Hi, and IQ-Lo) corresponding to the four possible outcomes. A third one-way Welch ANOVA was then conducted on transplant fitness, to determine if the transplant wait times were different for kinds of fitness. A Games-Howell *post hoc* analysis was run for this test as well, to determine statistically significant differences between each group depending on the length of time candidates had to wait for a replacement kidney.

Sample size for this type of design was calculated using power analysis, with G*Power 3.1.9.2 for Windows (Button et al., 2013). The effect size was set to a medium effect size convention set by Cohen for this type of test, which was .25 (Faul et al., 2009). The alpha error probability was set to a standard of 0.05, with a corresponding power of 95%. The numerator *df* (degrees of freedom) were set to 2 (for a main effect) and the number of groups were set to 9. These settings indicated a minimum sample size of 251 (total) or 27.88 per cell for nine cells. This total was rounded up so that each of the nine cells (each of the three levels of the three factors), would come out evenly, which was 252 in total and 28 per cell.

Data were obtained from the OPTN portion of the USRDS database. This repository was chosen because all organ transplants conducted in the U.S. must report candidate and recipient data to these organizations (Saran et al., 2017). The principal investigator submitted a formal data request to the program director of the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), per instructions from the USRDS project manager (see Appendix E). The request was approved and a spreadsheet containing detailed, anonymous, summary data were returned including footnotes to aid the researcher in the analysis of that data, corresponding to the specific data sample for this study.

Ethical Considerations

The data collected for this research were from the OPTN portion of the U.S. Renal Database System, an existing repository of publicly accessible data. None of the data collected could identify specific persons. The USRDS offered two kinds of request formats—one of which could not return sensitive data—and this format was used. The principal investigator followed all appropriate procedures for human participants research, and with the approval of the Institutional Review Board (IRB) before collecting data.

In accordance with the Belmont Principles, standards of human participants research were followed for the protection and well-being of participants, as well as the respect of their privacy. These standards included respect for persons, beneficence, and justice, which were applied by assessing risk versus benefit, and ensuring the selection of participants did not take advantage of protected groups (U.S. Department of Health and Human Services, 2016). Also in accordance with these principles, only the data needed

for the design were gathered, in keeping with best practices. Data were kept by the

principal investigator only, and secured so as not to compromise anonymity of

participants. As per the research standards of the American Psychological Association,

upon completion of the study, data will be stored and encrypted after the primary analysis

on a password-protected computer for a period of three years maximum (Devereaux &

Gottlieb, 2012).

Informed consent was not required because the data had already been collected in

a national repository under medical standards (U.S. Department of Health and Human

Services, 2015). Site permission for the data collection portion was officially requested

and granted prior to IRB approval (see Appendix D). There were no known conflicts of

interest, and the risk of participating in the research was minimal, because the data had

already been recorded and was retrieved as anonymous data. No incentive for

participation was offered because the data had already been collected in the secondary

data source.

Limitations and Delimitations

This study had some limitations. For the sample, obtaining a representative

sample was limited by the availability of the appropriate data in the secondary data

source. The variables in this study were primarily preexisting data and could only yield

causal-comparative (*ex post facto*) results. Tests for validity, consistency, reliability,

completeness, and reproducibility of the secondary source suggested interpretation of the

secondary data source without adjustments to the data might exhibit modest differences

from adjusted[2] data in the annual reports (Grams et al., 2011; U.S. Renal Data System,

1992). The annual report concluded, however that these differences exhibited sufficient

reliability (Grams et al., 2011; U.S. Renal Data System, 1992). As well, the reliability and completeness of the USRDS data had been studied and shown to be reliable against regional datasets such as Michigan's kidney registry (U.S. Renal Data System, 1992). The treatment data agreed within 87.2% to 93.2%. Although the professional allocation effort was toward unbiased decisions, the possibility of expert cognitive bias in medical record tracking and decision making had been expressed in Molony (2016). There was the possibility of observational biases with respect to causes, prognoses, diagnoses, and administrative decisions. However, as these same decisional biases were the subject of this research, this limitation may have helped to highlight the need for this study and strengthened rather than weakened its findings (Molony, 2016).

A discrepancy of note was a larger number of organ recipients than candidates among the youngest group in the data collected from the USRDS. This discrepancy may be explained by policy changes prioritizing the young in 2004 and 2014 (Chopra & Sureshkumar, 2015; Rodrigue et al., 2013). It is possible that, given the new policy, some of the younger individuals would not have been formally added to the waiting list if a kidney were available at the time. This would result in a discrepancy during the data collection stage between those who did not need an entry on the waiting list but were recorded as having ESRD. Another factor was the possible absence of corresponding mental impairment data outside the youngest age group, resulting in the decision to analyze the young and old groups separately. The resulting mean wait times, however, allowed the comparison of these groups after separate tests of each group had been conducted, and met the requirements of the separate hypotheses.

This study had some delimitations as well. A delimitation was the choice of literature included to sufficiently represent the state of the research of the phenomena under study (assessment bias and class prejudice). However, the breadth of literature suggesting evidence of assessment bias might have made the study infeasible if fully included.

Summary

This study used a quantitative method with a causal-comparative design to compare groups of candidates on the waiting list for a kidney transplant in the U.S. Renal Data System (USRDS), to test whether some groups such as older candidates (those who were physically unfit but mentally fit) and younger candidates (those who were mentally unfit but physically fit), waited longer to receive a kidney due to a physical or mental assessment bias. This was an important research question because a survey of the literature suggested that some groups such as those of advanced physical age and intellectual disability were being discriminated against in the process of screening and wait-listing candidates for life-saving kidney transplants (Cherkassky, 2011; Derrington et al., 2016). A comparison of less favored groups (as viewed by the industry) seemed not to have been attempted, for example an inadvertent preference for the survival of something other than the large numbers of living candidates assessed as unfit to care for the organs (Kivnick & Wells, 2014; Stone et al., 2013). A survey of secondary data in the U.S. Renal Data System allowed the comparison of these two groups by analyzing differences between mean wait times for kidney transplant across potential groups of physical age bias and mental age bias (Grams et al., 2012). In this dissertation's model of class prejudice, mental fitness was held to be superior to simply being physically alive,

with the former (mental superiority) often assessed to determine access to intimacy and group membership, and even to continued individual survival.

End stage renal disease (ESRD) is a terminal illness which results in physical and mental death unless a new kidney organ is transplanted without significant delay (Patzer, 2011). Since the number of candidates greatly exceeds the number of organs, candidates are ranked by physical and mental criteria and placed on a waiting list, even though the length of time on that list is the primary predictor of their premature death (Center for Bioethics, 2004; Patzer, 2011). A survey of secondary data in the U.S. Renal Data System allowed mean wait times for kidney transplant to be analyzed using a 3 x 3 between-groups factorial ANOVA (and eventually a set of Welch ANOVAs) to compare the group means of preferred versus unpreferred physical and mental fitness, to analyze whether international human rights guidelines could be violated during candidate assessment and preference (Grams et al., 2012). The data were measured by surveying a sample size of at least 252 participants (based on G*Power results) using data collected from a secondary data source, the OPTN portion of the USRDS. The secondary data source contained physical and psychological data ascertained to be valid and reliable by the organ transplantation community.

Prior to the actual study, the design was submitted to the IRB, and standards of human participants research were followed for the protection and well-being of participants, as well as the respect of their privacy. Data were to be analyzed using a 3 x 3 between-groups factorial in IBM© SPSS® version 24 (Morgan et al., 2013). Age-related bias, intellectual disability-related bias, and transplant wait time were analyzed for a statistically significant relationship. The factorial ANOVA method was chosen because

this study used a statistical test with two categorical independent variables, one continuous dependent variable, and a between-subjects design (Morgan et al., 2013). During the test of assumptions, the cell sizes exhibited heterogeneity of variance, which might have led to incorrect rejection of the null hypothesis. The researcher followed advice suggesting the use of a Box-Muller transform and a set of Welch ANOVAs followed by Games-Howell *post hoc* tests to accommodate this need (Delello et al., 2016; Moder, 2010). These were followed by a set of standard ANOVAs and Tukey's *post hoc* tests to verify the heterogeneity adaptation.

The successful completion of this data collection and data analysis has been conducted. Chapter 4 will present the data gathered from these measures, along with an exploration of the findings. These findings are then aligned with the research questions and variables, and summarized with respect to the problem statement and purpose of the study.

Chapter 4: Data Analysis and Results

Introduction

End stage renal disease (ESRD) is a terminal illness that results in death unless a new kidney transplant is received before the individual perishes (Center for Bioethics, 2004). As there are too many needy candidates and not enough kidneys, candidates are placed on a waiting list and ranked by physical and mental criteria. The transplant waiting time has been shown to be the key predictor of premature death from ESRD (Patzer, 2011). Prior studies suggested two groups waited longer than most, including those stereotyped as too young and mentally impaired (aged 0-17), and those stereotyped as physically too old (aged 65 and over; Grams et al., 2012; Wightman et al., 2014). This research study asked if some groups such as older candidates (those who were physically unfit but mentally fit) and younger candidates (those who were mentally unfit but physically fit), waited longer to receive a kidney due to a physical or mental assessment bias. The purpose of this quantitative method with a causal-comparative design was to compare groups of candidates on the waiting list for a kidney transplant in the U.S. Renal Data System (USRDS), to test whether some groups such as older candidates and younger candidates waited longer to receive a kidney due to a physical or mental assessment bias. If so, most of the individuals in these groups perished because they were indirectly neglected by assessment.

Data were obtained from a secondary data source, the OPTN portion of the USRDS database. This repository was chosen because all organ transplants conducted in the U.S. must report candidate and recipient data to these organizations (Saran et al., 2017). The principal investigator submitted a formal data request to the program director

of the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), per

instructions from the USRDS project manager. The request was approved and a

spreadsheet containing detailed, anonymous, summary data were returned, corresponding

to the specific data sample for this study. The requested data answered the following

questions:

RQ1: Do candidates whose physical age is too young or too old have significantly

longer transplant wait times compared to those who are just right?

RQ2: Do candidates whose mental age is too slow or somewhat slow have

significantly longer transplant wait times compared to those who are just

right?

RQ3: Do physical age and mental age interact to predict significantly longer

transplant wait times compared to those who are just right?

Chapter 4 contains three sections that summarize the results of the data analysis.

The first section presents descriptive data pertaining to the study sample. The second

section presents the data analysis procedures including steps taken to prepare the data for

analysis. The third section discusses the results of the statistical analysis performed for

each of the research questions and key findings.

Descriptive Data

This study was conducted by collecting existing data from the U.S. Renal Data

System (USRDS), which is the only official repository of data kept regarding kidney

organ candidates, donors, and outcomes. The validity and reliability of this data have met

compliance with federal, state, and local guidelines for the recording and documenting of

conditions such as end stage renal disease and been tested against regional datasets

(ESRD Surveyor Training Interpretive Guidance, 2008; U.S. Renal Data System, 1992; U.S. Renal Data System, 2015a). Data from the USRDS and tentative conclusions drawn from that data have exhibited both confidence and caution within the nephrology community, and its primary strengths are size and representativeness (Foley & Collins, 2013). Most of the sample data were collected by formal request through the USRDS project manager, and via a more thorough proposal through the program director at the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK). Previously published data in the 2016 annual data report (ADR), which was the first authoritative report of summary data for 2014, were consulted to resolve questions and unknowns regarding the sample data, as advised by the USRDS project manager. These sources of data have been made available to researchers to analyze hypotheses, evaluate programs, and "to create core metrics and measures, such as the assessment and reporting of provider performance" (U.S. Renal Data System, 2015a, para. 2).

The population consisted of human participants with end stage renal disease (ESRD) in need of a replacement kidney. The target population consisted of human participants on the kidney transplant waiting list. The sample consisted of human participants listed as active on the OPTN waiting list for kidney organ transplantation between January 1, 2014 to December 31, 2014 and included both first-time kidney transplant candidates and recipients (some received subsequent transplants as well but were not included since that might confound the reason for their selection). These were aggregated into three physical age groups and three mental age groups for the study design to align this research with previous research in which physical and mental age bias were found (Grams et al., 2012).

The demographic information in Table 2 was collected using a formal data request submitted to the USRDS, and also from the 2016 annual data report (which represents the first authoritative report of summary data for 2014), per guidance from the project manager at the USRDS. This information consisted of official data related to candidates on the waiting list for a kidney transplant for the year ending December 31, 2014. The number of candidates on the waiting list for this period was 88,231 ($N =$ 88,231). This decision to use the USRDS waiting list because of its authoritative validity and reliability, did however engender a few limitations. As a limitation of tentative conclusions which may be drawn from this study, it is helpful to consider that the actual number of persons with end stage renal disease (678,383) is much higher than those that meet the criteria for the replacement kidney waiting list (88,231), so that the actual wait times reported for a kidney transplant would be much higher for less favored groups if prescreened and excluded (uninsurable) groups were included (U.S. Renal Data System, 2016). It is also important to note that more persons die each year from end stage renal disease (ESRD) than were on the list for 2014 (95,254 perished from ESRD in 2014 alone). This research sample included only those that had "made" the waiting list (i.e. that exhibited sufficient physical and mental fitness for a transplant and to host/manage the survival of the organ).

Results showed that candidates were 61% male and 39% female, whereas kidney recipients were 61% male and 39% female. The ethnicity of candidates was predominantly White (53%) and Black (37%). Native Americans, Asians, and other ethnic groups (combined) represented less than 10% of the candidates. The ethnicity of kidney recipients was also predominantly White (66%) and Black (24%) with a marked

increase in the difference between the number of White and Black recipients compared to White and Black candidates. Native Americans, Asians, and other ethnic groups (combined) represented less than 10% of kidney recipients. The difference between male and female representation on the waiting list, per Iseki (2008), may be explained in part by the reproductive system in females. The statistically longer lives of women compared to men seems to coincide with this suggestion, along with lower systolic blood pressure than men. (Elevated blood pressure is a risk factor for chronic kidney disease; Schrier et al., 2014). The onset of kidney disease in women occurs later than in men, corresponding to a possibly protective period during the fertile years due to hormonal variability and emotional adaptations lacking in the male gender. This same suggestion has been made plain by researchers trying to explain why schizophrenia is more common in men (and its onset sooner in men), similar to these statistics regarding chronic kidney disease (Sönmez & Köşger, 2015).

The ages of candidates were predominantly from the just right age group between 18 and 64 at 80%, with the too old age group aged 65 and over at about 19%, and the too young age group under 18 at about 1%. This predominance is partly explained by the wider range of years for this age group (18-64), representing about two and a half times more years than the other age groups. After adjustment for group size differences[2], the just right age group accounted for 60% of candidates with the too old group accounting for about 38% and the too young age group accounting for about 2%. The poor representation of candidates under age 18 is partly explained by the lower likelihood of developing end stage renal disease from behavioral or environmental factors during childhood (Long, 2015; Wightman et al., 2014).

The number of kidney recipients on the waiting list for this period was 17,914 (n

= 17,914). The ages of kidney recipients were also predominantly the just right age group

aged 18 to 64 at about 79%, with the too old age group aged 65 and over at about 17%,

and the too young age group under 18 at about 4% (adjusting for discrepancies). As

mentioned concerning candidates on the waiting list, this predominance is partly

explained by the wider range of years for the just right age group, representing about two

and a half times more years than the other age groups. After adjustment for group size

differences[2], the just right age group still accounted for about 59% of recipients with the

too old group accounting for only about 34% and the too young age group accounting for

only about 7%. Recipients under age 18 appeared to fare better within their group as to

receipt of a kidney transplant after being wait listed, if they met the criteria (this

possibility was explored and found to be significant).

As explained in depth in the literature review, the diverging relationship between

the stable number of kidneys available and the annual increase of candidates on the

waiting list may be causally attributed. There is a decline among specific or

disadvantaged groups (for example males, Blacks, the young and economically

challenged). The opt-in policy (incentive-based donation) for organ donation in the

United States has been shown to reduce overall organ donations compared to opt-out

policies (Rodrigue et al., 2013; Shepherd et al., 2014).

Table 2

Candidate and Recipient Demographics (N = 88,231)

Demographic	Candidates		Recipients	
	N	%	*N*	%
Gender	88,231		17,914	
Male	53,455	60.59%	10,983	61.31%
Female	34,776	39.41%	6,931	38.69%
Age Group	88,231		17,914	
0 to 17	634	0.72%[1]	725	4.05%
18 to 64	70,649	80.07%	14,448	80.65%
65 or older	17,463	19.79%	3,310	18.48%
Ethnicity	88,231		17,914	
White	46,911	53.17%	11,960	66.76%
Black/African American	32,507	36.84%	4,353	24.30%
Native American	1,083	1.23%	158	0.88%
Asian	6,836	7.75%	1,179	6.58%
Other	894	1.01%	65	0.36%
Unknown	*	*	199	*
Ethnicity (cont.)	88,231		17,914	
Hispanic	17,631	19.98%	2,950	16.47%
Non-Hispanic	70,600	80.02%	14,964	83.53%

Note. These unadjusted figures include all ESRD patients on the waitlist for a kidney or kidney-pancreas transplant as of 12/31/2014. The age of the candidate or recipient is calculated on 12/31/2014. The above figures are unadjusted, and some of the figures may exhibit discrepancies with respect to the total number of candidates in the age group. Of note is the number of recipients with respect to candidates in the youngest age group. Recipients include first-time organ recipients only. [1]Candidates 0-17 are underreported.

Normality, skewness, and kurtosis were assessed by splitting the requested data along the independents (physical age and mental age) and exploring the descriptive statistics. Transplant wait times were normally distributed for all combinations of the

levels of the independents with a skewness close to 0.00 ($SE = 0.14$) and kurtosis of 0.13 ($SE = 0.28$). The assumption of normality for transplant wait time was satisfied for all group combinations of physical age and mental age, assessed by visual inspection of box plots (see Figure 7 in Appendix I), histograms (see Figure 8 in Appendix I), Q-Q Plots (see Figure 9 in Appendix I), and the Shapiro-Wilk test for normality shown in Table 3 ($p > .05$). Normality was rechecked after balancing cell sizes, and appears in Table 4. The assumption of homogeneity of variance, however, was not satisfied, and is addressed in the subsequent data analysis section.

Table 3

Tests of Normality before Balancing Cell Sizes

| | | Shapiro-Wilk | | |
PhysAge	MentAge	Statistic	df	Sig.
TooYoung	TooSlow	.993	64	.973
	SomeSlow	.981	97	.174
	JustRight	.997	466	.679
JustRight				
TooOld		1.000	3294	.742

Table 4

Tests of Normality after Balancing Cell Sizes

| | | Shapiro-Wilk | | |
PhysAge	MentAge	Statistic	df	Sig.
TooYoung	TooSlow	.997	300	.761
	SomeSlow	.997	300	.761
	JustRight	.997	300	.761
JustRight				
TooOld		.997	300	.761

Data analysis procedures

The data were collected from existing records for the kidney transplant waiting list of the USRDS[3] for the year ending December 31, 2014 (see Table 5, 6 and 7). The

sample size was 88,231 individuals, representing the much larger number of individuals

in need of a transplant versus the number of viable organs available. The actual number

of transplants was 17,914.

Table 5

Candidate and Recipient Physical Age Data from the USRDS

Request	Age 18-64	Age 65+
Number of active candidates for kidney transplant[1]	68,320	17,006
Number of kidney transplants[2]	13,694	3,294
Number of kidney transplants for mean wait time calculation[3]	13,546	3,242
Mean wait time for a kidney transplant[4]	775	785
Standard deviation of mean wait time	790	709

Note. [1]Includes all ESRD patients on the waitlist for a kidney or kidney-pancreas transplant on 12/31/2014. Age is calculated on 12/31/2014. [2]Includes all renal transplants during 2014. Age is calculated as of the day of transplant. [3]Some observations have a missing listing date. Therefore, the number of observations used for the calculation of the mean wait time in some rows may not match the total number of kidney transplants in other rows. [4]Includes all renal transplants during 2014, excluding those with a missing listing date. Age is calculated as of the day of transplant. Mean wait time is calculated by finding the mean number of days between listing date and transplant date according to the UNOS data.

Table 6

Candidate and Recipient Mental Age Data from the USRDS (0-4)

Cognitive Development	Active candidates[1]	Received transplant[2]	Adjusted transplant[3]	Mean wait (in days)[4]	*SD* (for wait)
Definite delay	19	17	16	323.13	274.70
Probable delay	12	*	*	*	*
Questionable delay	20	13	12	241.17	276.78
No delay	47	68	61	231.70	261.14
Not Assessed	28	23	19	160.53	82.43
Academic Level					
Full load	.	.	.	.	.
Reduced load	.	.	.	.	.
Unable (condition)	.	.	.	.	.
Unable (dialysis)	.	.	.	.	.
N/A (<5, graduate)	126	125	112	235.12	241.75
Status unknown	.	.	.	.	.
Academic Progress					
Within 1 grade level	.	.	.	.	.
Delayed grade level	.	.	.	.	.
Special education	.	.	.	.	.
N/A (<5)	126	125	112	235.12	241.75
Status unknown	.	.	.	.	.

Note. [1]Includes all ESRD patients on the waitlist for a kidney or kidney-pancreas transplant on 12/31/2014. Age is calculated on 12/31/2014. [2]Includes all renal transplants during 2014. Age is calculated as of the day of transplant. [3]Some observations have a missing listing date. Therefore, the number of observations used for the calculation of the mean wait time is not necessarily equal to the total number that received a transplant. [4]Includes all renal transplants during 2014, excluding those with a missing listing date. Age is calculated as of the day of transplant. Mean wait time is calculated by finding the mean number of days between listing date and transplant date according to the UNOS data. *Suppressed due to small cell counts. The "." indicates zero values in this cell.

Table 7

Candidate and Recipient Mental Age Data from the USRDS (5-17)

Cognitive Development	Active candidates[1]	Received transplant[2]	Adjusted transplant[3]	Mean wait (in days)[4]	*SD* (for wait)
Definite delay	54	54	52	311.29	428.99
Probable delay	29	17	17	495.71	417.35
Questionable delay	36	30	30	313.53	430.37
No delay	323	419	405	263.96	324.97
Not Assessed	70	65	62	267.53	340.09
Academic Level					
Full load	299	364	356	248.71	305.45
Reduced load	81	85	85	349.11	390.87
Unable (condition)	14	11	11	403.36	398.72
Unable (dialysis)	22	*	*	*	*
N/A (<5, graduate)	38	*	*	*	*
Status unknown	69	110	100	301.28	413.93
Academic Progress					
Within 1 grade level	344	418	410	260.89	298.81
Delayed grade level	38	27	27	262.59	283.42
Special education	50	48	47	419.34	556.21
N/A (<5)	37	*	*	*	*
Status unknown	54	88	78	288.29	430.87

Note. [1]Includes all ESRD patients on the waitlist for a kidney or kidney-pancreas transplant on 12/31/2014. Age is calculated on 12/31/2014. [2]Includes all renal transplants during 2014. Age is calculated as of the day of transplant. [3]Some observations have a missing listing date. Therefore, the number of observations used for the calculation of the mean wait time is not necessarily equal to the total number that received a transplant. [4]Includes all renal transplants during 2014, excluding those with a missing listing date. Age is calculated as of the day of transplant. Mean wait time is calculated by finding the mean number of days between listing date and transplant date according to the UNOS data. *Suppressed due to small cell counts. The "." indicates zero values in this cell.

Data preparation. The extent of raw data collected from the USRDS[3] was requested to meet the categorical requirements of this research study. The principal investigator then combined the field data related to chronological age (potential for physical age bias) and delayed intellectual development (potential for mental age bias) using an Excel spreadsheet as outlined in detail in Wightman et al. (2014). The

aggregated results appear in Table 8. Minor discrepancies in totals versus field-related

sizes were adjusted to match the authoritative summary for 2014 in the 2016 annual data

report. Those figures, however, were within 97% to 99% before adjustment, and possibly

due to minor reporting differences between transplantation centers versus the shared

database (U.S. Renal Data System, 1992).

The data associated with the first independent variable (physical age) needed only

minor adjustment to match the totals for group transplant statistics, as the data

represented summary figures regarding age distribution (only) among kidney transplant

candidates and recipients (too young, too old, and just right). The data for the second

independent variable (mental age) were aggregated to fit the variable format described by

this study, because the age group from birth to four years old did not contain school-age

data, whereas the age group from five years old to 17 years old did contain school-age

data. This was accomplished by combining the level of cognitive impairment with the

level of academic delay (when applicable) for candidates under the age of 18,

corresponding to the levels of the second independent variable (mental age). These were:

too slow (very impaired), somewhat slow (somewhat impaired), and just right

(unimpaired).

The total number of candidates, recipients, and wait times in each category

formally requested from the USRDS were checked against the totals reported in the

authoritative summary for 2014 in the 2016 USRDS annual data report and adjusted to

match, to permit explanation of minor discrepancies (U.S. Renal Data System, 2016).

These numerical discrepancies were found to align with the differences in sets of search

criteria. The independent totals were found to align regardless of those minor

discrepancies, when not tabulated under differing sets of search criteria. For example, although the number of recipients of a kidney by gender in the summary data of the 2016 USRDS annual data report (reporting for the year 2014), varied from that of the total number by age reported in the requested sample, these figures were within 97% of each other (see Table 2). The number of candidates varied even less, with the summary figures within 99% of each other. Although the figures listed in the annual data report (see Table 2) differed slightly from the totals in the de-identified sample summaries (see Tables 5, 6 and 7), the proportions between age groups remained equivalent within 97% as described. This discrepancy was most probably due to the annual data reports containing adjusted data whereas the raw sample was unadjusted[2]. Aggregate figures representing critical reconciliation of the sample to the annual data report appear in Table 8.

Table 8

Aggregate Candidate Data for Study Variable Structure

Mental Age		Physical Age			
		Just Right	Too Old	Too Young	Total
Just Right	Candidates	68,320	17,006	391	85,717
	Recipients	13,694	3,294	466	17,454
	Mean Wait Time	775.50	785.10	249.54	
	Standard Deviation	790.50	709.60	293.06	
Somewhat Slow	Candidates			113	
	Recipients			97	
	Mean Wait Time			368.44	
	Standard Deviation			347.07	
Too Slow	Candidates			73	
	Recipients			64	
	Mean Wait Time			371.24	
	Standard Deviation			415.46	
Total	Candidates			813	
	Recipients			627	

Note. The largest figure was used where row information did not exactly match, since the figures were always less when not exact, and could not be less than the largest figure reported. See notes in Table 6 and Table 7 which were provided as guidance for the researcher by the reporting representative from the USRDS; some figures had not been fully reported (perhaps due to situational urgency), which explains the minor discrepancies between totals for specific factors versus totals for groups of persons.

A discrepancy of note in Tables 6, 7, and 8 was a larger number of recipients than candidates in the data collected from the USRDS. This discrepancy may be explained in part by the new policies in 2004 and 2014, which required allocation of available kidneys from deceased donors under 35 years of age to candidates under 18, whether on the waiting list or not (Chopra & Sureshkumar, 2015; Rodrigue et al., 2013). It is possible that, given the new policy, persons under the age of 18 would not have been formally added to the list as there would have been no need to rank them or waitlist them, if there were a kidney available at the time of need. As the annual reports include all cases of

chronic kidney disease (CKD) and end stage renal disease (ESRD), this might result in a discrepancy during data collection for those who did not need an entry on the waiting list but were recorded as having ESRD.

The data collected from the USRDS and aggregated into the variable structure for this study represented de-identified, anonymous, summary data, as shown above in Table 8. However, as IBM© SPSS® version 24 requires raw data and not summary data to perform a factorial ANOVA, the principal investigator researched techniques for addressing this limitation of the SPSS® software, and discovered a solution known as the Box-Muller transform (Howard, 2014). This transform allows raw data to be regenerated programmatically from summary statistics, because parametric tests assume a normal distribution. As this research collected anonymous, summary statistics, the Box-Muller transform was an ideal method to reproduce the pseudo-random number sampling needed for entering the collected data into SPSS®.

This could have been accomplished using the INVNORM function in Microsoft© Excel®, however this study required a more robust solution to avoid the amount of manual input needed to generate test sets for this nine-cell design. Also, a programmatic solution was deemed a good way to more exactly approximate raw data in the USRDS waiting list based on age group summary statistics, since both the within-groups means and standard deviations (for mental ages) and between-groups means and standard deviations (for physical ages) needed to match. The principal investigator adapted C++ code for this purpose using Microsoft© Visual Studio 2008® (listed in the Acknowledgements section). The resulting C++ code for the console program used to generate the normally distributed raw data from the summary figures provided by the

USRDS is shown in Appendix F. This program successively generated raw data scores

matching the summary statistics from the USRDS within 2% to 5% of the mean and

standard deviation. Interestingly, similar to initial estimates for cell sizes using G*Power,

larger pseudo-random normalized samples (200 or more) were found to result in means

and standard deviations within 1% of the target means and standard deviations, whereas

smaller samples for the younger age groups (less than 100) sometimes deviated more

than 10% from the targets, and larger samples did not improve accuracy and seemed to

decrease power. The principal investigator addressed this by adding a validation

procedure which estimated the descriptive statistics that would be generated against the

original mean and standard deviation, for excessive variance from the target mean and

standard deviation (Ghasemi & Zahediasl, 2012). The procedure was then modified to

loop the code and repeat the procedure until the variance was significantly close to the

target (usually within 3%) before generating the output file. This raw score generator for

Gaussian distributions became helpful for running tests to achieve adequate cell sizes for

statistical power without varying from the means and standard deviations provided by the

USRDS sample data fulfillment requests. The resulting overall observed power was .997

and 1.000 (please see Results section for details).

Analysis procedures. The transplant waiting time data representing physical age

and mental age collected from the USRDS were entered into IBM© SPSS® 24, as two

independent, categorical variables with three levels each, and one dependent continuous

variable. The assumptions for a 3 x 3 between-groups factorial ANOVA were checked

first. The first three assumptions were met (both independent variables were categorical,

the dependent variable was continuous, and the grouped observations were independent

of each other). The fourth assumption (that there were no significant outliers) was checked by first splitting the file into cells using the Data/Split function in SPSS®, and using the Explore function to analyze the descriptive statistics using box plots. There were no significant outliers in the boxplots. The data file was then restored using the Data/Split function. At the same time, the fifth assumption (normality) was checked using the Shapiro-Wilk's test, and the data were normally distributed as expected ($p > .05$). (The normality assumption was expected because the raw scores were generated from the summary statistics from the USRDS using the Box-Muller transform which generates normal distributions). The sixth assumption (homogeneity of variance), however, showed that Levene's test of equality of error variances was not met ($p < .005$), partly because the cell sizes for age groups in the results were very different. The results are shown in Table 9. For example, the unadjusted number of kidney transplants for the mean wait time calculation for the just right age group was 13,546, and the same unadjusted number for the too old age group was 3,242.

Table 9

Levene's Test of Equality of Error Variances for 3 x 3 ANOVA

F	*df1*	*df2*	Sig.
14.17	2	897	.000

Note: The dependent variable was transplant wait time.

Since the equality of variances assumption was violated, the data were checked again, and the groups sizes and variances were found to be visibly heterogeneous. The principal investigator researched the topic and followed advice suggesting balancing of the cell sizes to address the unequal cell sizes aspect of the problem (Delello et al., 2016). This was tried first because this research collected summary statistics, and as long as the

resulting summary statistics, power, and effect sizes did not vary beyond acceptable

margins, the cell sizes should be modifiable as needed to better meet the assumptions. A

size was chosen ($N = 300$) to accord with both the G*Power estimate and also to permit

adequate generation of raw scores without losing the normal distribution property.

G*Power advised 28 per cell (292 in total), but this would have resulted in inadequate

adherence to the summary means and standard deviations. This was verified in the

GEN3.EXE software application written for this purpose (see the projected cell sizes in

Table 10).

The normality was checked again but Levene's did not show sufficient

improvement to guarantee having met this assumption. Peer-reviewed sources argue that,

although continuing in light of heterogeneity of variance could lead to under or

overestimates of effect size, the results will not add bias if the different cell sizes

accurately depict the full population proportions (Delello et al., 2016). As this was true

for this study, these sources advise the use of Welch ANOVA as a substitute in these

cases, because ANOVA and the Kruskal-Wallis may produce Type I errors that are

overly conservative with large sample sizes or liberal with small sample sizes (Moder,

2010). When a Welch ANOVA is used, sources also suggest following it with a Games-

Howell *post hoc* (Rodríguez et al., 2017). This approach was taken.

Table 10

Projected Cell Sizes versus Variation from Target Statistics

Statistic	Cell size: 50	Cell size: 300
Target mean	249.54	249.54
Sample mean	295.45	250.02
Target *SD*	293.06	293.06
Sample *SD*	233.01	295.83
Sample mean is within	-18.40%	-0.19%
Sample *SD* is within	20.49%	-0.95%
Number of attempts	11*	1*

Note: Projected means and standard deviations were generated with the GEN3.EXE software program via Box-Muller transformed raw scores. The * indicates the number of retries to balance the cell sizes (maximum of 10).

Standard ANOVA approach. The Welch ANOVA might not be as familiar to researchers as a standard ANOVA, and there might be questions regarding differences in significance for main effects and interactions. A standard ANOVA was performed to retest the results and is presented first. The results of a standard 3 x 3 between-groups factorial ANOVA (to compare the group means of preferred versus unpreferred physical and mental fitness) resulted in the same main effects as the Welch ANOVAs.

It was discovered that physical age could be analyzed against mental age using two-way ANOVA for all combinations of mental age when physical age was too young, resulting in the same output as the second Welch ANOVA. It was also discovered that physical age and mental age could each be analyzed separately as one-way ANOVAs, resulting in the same output as the first and second Welch ANOVAs. However, for the third research question and an interaction, there was still a need to combine the transplant outcomes into four logical categories as previously described, as some of the

combinations of factors would not provide enough information to establish an interaction (those combinations would produce zeroes in SPSS®).

Welch ANOVA approach. The data were split into two one-way ANOVAs for the Welch ANOVA, one for the first IV (physical age) and one for the second IV (mental age). This was done because it might weaken the validity or significance, if chronological age data and mental age data were checked using a two-way Welch ANOVA, given the unequal variances problem. The Welch ANOVA was successful at meeting a robust test of equality of means ($p < .005$) for both independent variable sets, and facilitated the inspection of the differences between the levels of each independent variable.

A one-way Welch ANOVA was first conducted on physical age, to determine if the transplant wait times were different for groups of different physical ages. Transplant recipients were classified into three age groups: too young ($n = 674$), too old ($n = 3,294$), and just right ($n = 13,694$). There were no outliers, which was checked using boxplots (see Figure 7 in Appendix I). The data were normally distributed for each group, which was checked using the Shapiro-Wilk test ($p > .05$). There was heterogeneity of variance, as expected, which was checked using Levene's test of equality of variances ($p < .05$). A Games-Howell *post hoc* analysis was run to determine statistically significant differences between each group.

A one-way Welch ANOVA was then conducted on mental age, to determine if the transplant wait times were different for groups of different mental ages. Transplant recipients were classified into three groups: too slow ($n = 674$), somewhat slow ($n = 3,294$), and just right ($n = 13,694$). There were no outliers, which was checked using boxplots. The data were normally distributed for each group, which was checked using

the Shapiro-Wilk test ($p > .05$). There was heterogeneity of variance, as expected, which was checked using Levene's test of equality of variances ($p < .05$). A Games-Howell *post hoc* analysis was run to determine statistically significant differences between each group.

The test for an interaction was tested by combining the transplant outcomes into four logical categories, representing a truth table given two dichotomous factors (mental or physical, transplant or no transplant). This allowed a third one-way Welch ANOVA to be performed to look for an interaction, followed by a Games-Howell *post hoc* as before. The independent was labeled Fitness and the four levels were labeled physical quotient high and low, and intelligence quotient high and low (PQ-Hi, PQ-Lo, IQ-Hi, and IQ-Lo) corresponding to the four possible outcomes, based on earlier advice during the proposal stage from the researcher's methodologist. A third one-way Welch ANOVA was then conducted on transplant fitness, to determine if the transplant wait times were different for kinds of fitness. The normal distributions and outliers had already been checked in the two previous Welch ANOVA tests, and heterogeneity of variance was assumed. The assumption of normality for transplant wait time was satisfied for all group combinations of physical age and mental age, assessed by visual inspection of box plots (see Figure 7 in Appendix I), histograms (see Figure 8 in Appendix I), Q-Q Plots (see Figure 9 in Appendix I), and the Shapiro-Wilk test for normality shown before and after balancing for cell sizes as shown in Table 3 and Table 4 ($p > .05$). The prior tests for homogeneity of variance can be viewed in Tables 9, 11, 15, and 19. A Games-Howell *post hoc* analysis was run for this test as well, to determine statistically significant differences between each group.

Validity and reliability of collected data. The data collected from the USRDS represented the only validated repository for information on the waiting list for the U.S. Renal Data System. The communities served by the renal data include the medical personnel, administrative personnel, organ donors, and recipients of transplanted organs (U.S. Renal Data System, 2015a). Data from the USRDS and tentative conclusions drawn from that data have exhibited both confidence and caution within the nephrology community. According to Foley & Collins (2013), its primary strengths are size and representativeness. The data collected for this study were drawn from carefully recorded statistical physical and mental information about nearly all U.S. patients treated for chronic kidney disease (CKD) and for end stage renal disease (ESRD).

The repository does have a few limitations, in that, being the sole repository, it is difficult to validate the methods by which the data are recorded, to include ancillary conditions or lab data when the patients are registered, or directly report whether survival bias is present in the end stage renal disease treatment community (Foley & Collins, 2013). Although a systematic review of existing datasets by Grams et al. (2011) suggested variability when attributing the primary cause of death (31% agreement between sources, and a *kappa* of 0.24), the review also concluded these percentages were likely due to the need to classify patient cause of death for initial claims purposes, misattributing the primary condition with comorbidities not covered by the claims directly. Also, cause of death was not a factor in this study. The collection and analysis of datasets used in this study were performed with these limitations in mind and the results, when compared with similar studies, suggest considerable validity matching the annual reports used by the nephrology community (Foley & Collins, 2013). The kidney

allocation system may not include data for those in need of a transplant who do not meet the criteria for transplant (often based on the insurability of the individual) and therefore may not be represented in the database.

The reliability and completeness of the USRDS data has been studied. Its use as a source of reliable information has been demonstrated against regional datasets such as Michigan's kidney registry (U.S. Renal Data System, 1992). For example, the treatment data agreed within 87.2% to 93.2%. The primary differences were shown to be related to items of mostly national concern (Medicare) versus regional concern (the Michigan Kidney Registry), which is expected given the differing mission and goals of these programs. Tests for consistency and reproducibility suggested some caution should be involved in interpreting the data as completely independent. However, the minor deviations between national and regional datasets may in contrast suggest there is significant consistency and sufficient reliability, since many studies have remarked on the variability between data centers versus the overall convergence of reliable information in the USRDS (Grams et al., 2011; U.S. Renal Data System, 1992). The data collected for this study, however, exhibited equivalence to the published reports within 97% to 99% before adjustment (U.S. Renal Data System, 2016).

Results

The results of both standard and Welch ANOVA tests are presented in the following sections. Although the Welch ANOVAs were conducted initially, these results are presented with the standard ANOVA results first. This is because a standard ANOVA may be more familiar to readers and enhance the readability of this chapter.

Results of standard ANOVA retest. The Welch ANOVAs might have raised

questions regarding differences between the choice of Welch to accommodate

heterogeneity of variance and a standard ANOVA, so a standard 3 x 3 between-groups

factorial ANOVA was performed even though the homogeneity of variance assumption

was violated—to retest the results. A standard two-way ANOVA was conducted to test

both physical age and mental age to see if transplant wait times were affected and which

variable might affect wait time more. There was a statistically significant difference

between groups, $F(2, 897) = 11.24$, $p < .0005$ for mental age, however physical age and

the interaction between physical age and mental age were difficult to ascertain as the

mental age data provided from the waiting list primarily applied to the physical age group

labeled too young and not to the other two levels (just right and too old). As a result, the

same adaptation was performed as for Welch using standard one-way ANOVA for each

independent variable to address research questions one and two, and then both were

combined into one four-level independent variable (a truth table) as before to address

research question three. The results of these standard ANOVA retests follow.

Research question 1. A standard one-way ANOVA was conducted for physical

age to test whether transplant wait times were affected by physical age differences.

Recipient groups were classified as before into too young, just right, and too old. Tests

for outliers, normal distribution, and homogeneity resulted in the same meeting of

assumptions and failure of homogeneity as before. The data are presented as means and

standard deviations. Wait times increased just as they did for the Welch ANOVA, from

too young ($M = 250.02$, $SD = 296.33$), to just right ($M = 776.80$, $SD = 799.31$), to too old

($M = 786.27$, $SD = 717.51$) physical age groups, in that order. There was a statistically

significant difference between groups, $F(2, 897) = 68.28$, $p < .0005$. Tukey's *post hoc*

analysis revealed that the mean increase from too young to just right (-526.78, 95% CI [-

650.09, -403.47]) was statistically significant ($p < .005$), as well as the increase from too

young to too old (-536.25, 95% CI [-659.56, -412.94], $p < .005$). However, there was

insufficient significance between just right and too old ($p = .982$). Observed power was

1.000 overall. See Tables 12, 13, and 14 for results.

Table 11

Levene's Test of Equality of Error Variances for H1

F	df1	df2	Sig.
83.72	2	897	.000

 Note: The dependent variable was transplant wait time.

Table 12

Physical Age Standard ANOVA Means and Standard Deviations

Age Group	N (orig.)	Mean Wait	SD
TooYoung	300 (391)*	250.02	296.33
JustRight	300 (68,320)*	776.80	799.31
TooOld	300 (17,006)*	786.27	717.51

Note. * indicates that numbers in parentheses are the original cell counts before
standardizing.

Table 13

Physical Age Standard ANOVA Results

Age Group	df1	df2	F	Sig.
Between Groups	2		68.28	.000
Within Groups	897			

Table 14

Physical Age Tukey's HSD Comparisons

PhysAge	Level	Mean Difference	SE	Sig.	95% Confidence Interval Lower Bound	Upper Bound
TooYoung	JustRight	-526.78*	52.53	.000	-650.09	-403.47
	TooOld	-536.25*	52.53	.000	-659.56	-412.94
JustRight	TooYoung	526.78*	52.53	.000	403.47	650.09
	TooOld	-9.47	52.53	.982	-132.78	113.84
TooOld	TooYoung	536.25*	52.53	.000	412.94	659.56
	JustRight	9.47	52.53	.982	-113.84	132.78

Note. * indicates that the mean difference is significant at the 0.05 level.

Research question 2. A standard one-way ANOVA was conducted for mental age to test whether transplant wait times were affected by mental age differences. Recipient groups were classified as before into too slow, somewhat slow, and just right. Tests for outliers, normal distribution, and homogeneity resulted in the same meeting of assumptions and failure of homogeneity as before. The data are presented as means and standard deviations. Wait times increased just as they did for the Welch ANOVA, from just right ($M = 250.02$, $SD = 296.33$), to somewhat slow ($M = 369.01$, $SD = 350.94$), to too slow ($M = 371.92$, $SD = 420.09$) mental age groups, in that order. There was a

statistically significant difference between groups, $F(2, 897) = 11.24$, $p < .0005$. Tukey's

post hoc analysis revealed that the mean increase from too slow to just right (121.90,

95% CI [53.02, 190.79]) was statistically significant ($p < .005$), as well as the increase

from somewhat slow to just right (118.99, 95% CI [50.10, 187.87], $p < .005$). However,

there was insufficient significance between too slow and somewhat slow ($p = .995$).

Observed power was .997 overall. See Tables 16, 17, and 18 for results.

Table 15

Levene's Test of Equality of Error Variances for H2

F	df1	df2	Sig.
14.17	2	897	.000

Note: The dependent variable was transplant wait time.

Table 16

Mental Age Standard ANOVA Means and Standard Deviations

Age Group	*N* (orig.)	Mean Wait	*SD*
TooSlow	300 (73)*	371.92	420.09
SomeSlow	300 (113)*	369.01	350.94
JustRight	300 (391)*	250.02	296.33

Note. * indicates numbers in parentheses are the original cell counts before standardizing.

Table 17

Mental Age Standard ANOVA Results

Age Group	df1	df2	F	Sig.
Between Groups	2		11.24	.000
Within Groups	897			

Table 18

Mental Age Tukey's HSD Comparisons

MentAge	Level	Mean Difference	*SE*	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
TooSlow	SomeSlow	2.91	29.34	.995	-65.97	71.80
	JustRight	121.90	29.34	.000	53.02	190.79
SomeSlow	TooSlow	-2.91	29.34	.995	-71.80	65.97
	JustRight	118.99	29.34	.000	50.10	187.87
JustRight	TooSlow	-121.90	29.34	.000	-190.79	-53.02
	SomeSlow	-118.99	29.34	.000	-187.87	-50.10

Note. * indicates the mean difference is significant at the 0.05 level.

Research question 3. The focus of this question was to ascertain which variable (physical fitness or mental fitness) affected mean wait time for a transplant the most, and might therefore be a favored trait. To address this question in light of the questionable assumption of homogeneity of variance and the need to test for an interaction between physical age and mental age beyond the results of two-way ANOVA, the data were arranged into four logical categories, representing a truth table given two dichotomous factors (mental or physical, transplant or no transplant), equivalent to the two independent variables but testable as one independent variable. This allowed a third one-way standard ANOVA to be performed to look for an interaction, followed by a Tukey's *post hoc* as before. The independent was labeled transplant fitness and the four levels were labeled physical quotient high and low, and intelligence quotient high and low (PQ-Hi, PQ-Lo, IQ-Hi, and IQ-Lo) corresponding to the four possible outcomes. A third one-way standard ANOVA was then conducted on transplant fitness, to determine if the

transplant wait times were different for kinds of fitness. The normal distributions and outliers had already been checked in the two previous standard ANOVA tests, and heterogeneity of variance was assumed. Wait times increased from IQ-Hi ($M = 250.02$, $SD = 296.33$), to IQ-Lo ($M = 370.47$, $SD = 386.74$), to PQ-Lo ($M = 518.15$, $SD = 610.59$) to PQ-Hi ($M = 776.80$, $SD = 799.31$) transplant fitness groups, in that order. There was a statistically significant difference between groups, $F(3, 1796) = 56.54$, $p < .0005$. Tukey's *post hoc* analysis revealed significance for all combinations of the independent variable ($p < .005$ for all except IQ-Lo to IQ-Hi which was $p < .009$), for example between IQ-Hi and IQ-Lo (-120.45, 95% CI [-219.24, -21.65]), and between IQ-LO and PQ-Lo (-147.68, 95% CI [-228.34, -67.01]), and between PQ-Lo and PQ-Hi (-258.66, 95% CI [-357.45, -159.86]). See Tables 20, 21, and 22 for results.

These retests of the Welch ANOVA approach using standard ANOVA verify that the means, standard deviations, and significant differences between groups correspond to the primary approach taken by this research. In the following section, the initial Welch ANOVA procedures are described, along with Games-Howell *post hoc* tests. Those tests preceded these standard ANOVA retests.

Table 19

Levene's Test of Equality of Error Variances for H3

F	df1	df2	Sig.
90.03	3	1796	.000

Note: The dependent variable was transplant wait time.

Table 20

Physical/Mental Age Standard ANOVA Means and Standard Deviations

Age Group	*N* (orig.)	Mean Wait	*SD*
PQ-lo	300 (17,397)*	518.15	610.59
PQ-hi	300 (68,320)*	776.80	799.31
IQ-lo	300 (186)*	370.47	386.74
IQ-hi	300 (391)*	250.02	296.33

Note. * indicates numbers in parentheses are the original cell counts before standardizing.

Table 21

Physical/Mental Age Standard ANOVA Results

Age Group	*df1*	*df2*	*F*	Sig.
Between Groups	3		56.54	.000
Within Groups	1796			

Table 22

Physical/Mental Age Tukey's HSD Comparisons

Transplant Fitness	Contrast	Mean Difference	*SE*	Sig.	95% Confidence Interval Lower Bound	Upper Bound
PQ-lo	PQ-hi	-258.66*	38.42	.000	-357.45	-159.86
	IQ-lo	147.68*	31.37	.000	67.01	228.34
	IQ-hi	268.12*	38.42	.000	169.33	366.92
PQ-hi	PQ-lo	258.66*	38.42	.000	159.86	357.45
	IQ-lo	406.33*	38.42	.000	307.54	505.13
	IQ-hi	526.78*	44.36	.000	412.70	640.86
IQ-lo	PQ-lo	-147.68*	31.37	.000	-228.34	-67.01
	PQ-hi	-406.33*	38.42	.000	-505.13	-307.54
	IQ-hi	120.45*	38.42	.009	21.65	219.24
IQ-hi	PQ-lo	-268.12*	38.42	.000	-366.92	-169.33
	PQ-hi	-526.78*	44.36	.000	-640.86	-412.70
	IQ-lo	-120.45*	38.42	.009	-219.24	-21.65

Note. * indicates that the mean difference is significant at the 0.05 level.

Results of Welch ANOVA tests. As stated in the previous sections which presented the results of the standard ANOVA retests, three Welch ANOVAs (and standard ANOVAs) conducted in SPSS® allowed quantification of the three research questions of this study, using validated, reliable data from the USRDS aggregated into two operationalized independent variables, one dependent measure, and three testable hypotheses. The three research questions from which these tests were derived were:

RQ1: Do candidates whose physical age is too young or too old have significantly

longer transplant wait times compared to those who are just right?

RQ2: Do candidates whose mental age is too slow or somewhat slow have

significantly longer transplant wait times compared to those who are just right?

RQ3: Do physical age and mental age interact to predict significantly longer

transplant wait times?

The results of the hypothesis testing of these three research questions follow.

Research question 1. The first research question asked whether a physical age

bias were involved in the delay before receiving a transplant. Such a bias might indicate

bias in the criteria. The null hypothesis was this:

H1$_0$:   Candidates whose physical age is too young or too old do not have

significantly longer transplant wait times compared to those who are just right.

The focus of this question was to ascertain whether there were significant

differences in wait times between physical (chronological) age groups on the waiting list,

especially for the just right age group versus those deemed too young to work or too old.

To answer this question, a Welch ANOVA was performed using SPSS® to compare the

mean wait times between physical age groups across the lifespan. A one-way Welch

ANOVA was first conducted on physical age, to determine if the transplant wait times

were different for groups of different physical ages. Transplant recipients were classified

into three age groups: too young ($n = 674$), too old ($n = 3,294$), and just right ($n =$

13,694). There were no outliers, which was checked using boxplots (see Appendix I).

The data were normally distributed for each group, which was checked using the Shapiro-

Wilk test ($p > .05$). There was heterogeneity of variance, as expected, which was checked

using Levene's test of equality of variances ($p < .005$, as shown in Table 11). Wait times increased from too young ($M = 250.02$, $SD = 296.33$), to just right ($M = 776.80$, $SD = 799.31$), to too old ($M = 786.27$, $SD = 717.51$) physical age groups, in that order. There was a statistically significant difference between groups, Welch's $F(2, 494.46) = 113.71$, $p < .0005$, $\omega^2 = 0.13$. Games-Howell *post hoc* analysis revealed that the mean increase from too young to just right (-526.78, 95% CI [-642.59, -410.97]) was statistically significant ($p < .005$), as was the increase from too young to too old (-536.25, 95% CI [-641.68, -430.81], $p < .005$). However, there was insufficient significance between just right and too old ($p = .987$). Observed power was 1.000 overall. See Tables 23, 24, and 25 for results.

The hypothesis for the first research question tested whether candidates whose physical age was too young or too old had significantly longer transplant wait times compared to those who were just right. The group means were significantly different ($p < .05$), but not in the direction hypothesized. This result however suggested even stronger evidence of mental favoritism, in that the age before the just right group, if both mentally and physically fit, seemed to be favored by significantly lower wait times, between all age groups and within the youngest age group. Unexpectedly, those who had already contributed a lifetime of service to society seemed to wait longer than those who had not yet contributed, suggesting a bias for the young and mentally fit. See Tables 23, 24, and 25 for results.

Table 23

Physical Age Welch ANOVA Means and Standard Deviations

Age Group	*N* (orig.)	Mean Wait	*SD*
TooYoung	300 (391)*	250.02	296.33
JustRight	300 (68,320)*	776.80	799.31
TooOld	300 (17,006)*	786.27	717.51

Note. * indicates numbers in parentheses are the original cell counts before standardizing.

Table 24

Physical Age Welch ANOVA Results

Age Group	Statistic*	*df1*	*df2*	*F*	Sig.
Between Groups		2		68.28	.000
Within Groups		897			
Welch	113.71	2	494.46		.000

Note. * indicates asymptotically *F* distributed.

Table 25

Physical Age Games-Howell Comparisons

PhysAge	Level	Mean Difference	*SE*	Sig.	95% Confidence Interval Lower Bound	Upper Bound
TooYoung	JustRight	-526.78*	49.22	.000	-642.59	-410.97
	TooOld	-536.25*	44.82	.000	-641.68	-430.81
JustRight	TooYoung	526.78*	49.22	.000	410.97	642.59
	TooOld	-9.47	62.01	.987	-155.18	136.24
TooOld	TooYoung	536.25*	44.82	.000	430.81	641.68
	JustRight	9.47	62.01	.987	-136.24	155.18

Note. * indicates that the mean difference is significant at the 0.05 level.

Research question 2. The second research question asked whether a mental age bias were involved in the delay before receiving a transplant. Such a bias might indicate bias in the criteria. The null hypothesis was this:

H2$_0$:   Candidates whose mental age is too slow or somewhat slow do not have

significantly longer transplant wait times compared to those who are just right.

The focus of this question was to ascertain whether there were significant differences in wait times between mental (cognitive) age groups on the waiting list, especially for unemancipated youth either likely or unlikely to achieve mental fitness. To answer this question, a Welch ANOVA was performed using SPSS® to compare the mean wait times between groups of varying cognitive ability under 18 years of age. A one-way Welch ANOVA was then conducted on mental age, to determine if the transplant wait times were different for groups of different mental ages. Transplant recipients were classified into three groups: too slow ($n = 674$), somewhat slow ($n = 3,294$), and just right ($n = 13,694$). There were no outliers, which was checked using boxplots. The data were normally distributed for each group, which was checked using the Shapiro-Wilk test ($p > .05$). There was heterogeneity of variance, as expected, which was checked using Levene's test of equality of variances ($p < .05$, as shown in Table 15). Wait times increased from just right ($M = 250.02$, $SD = 296.33$), to somewhat slow ($M = 369.01$, $SD = 350.94$), to too slow ($M = 371.92$, $SD = 420.09$) mental age groups, in that order. There was a statistically significant difference between groups, $F(2, 586.56) = 13.50$, $p < .0005$, $\omega^2 = 0.02$. Games-Howell *post hoc* analysis revealed that the mean increase from too slow to just right (121.90, 95% CI [52.15, 191.66]) was statistically significant ($p < .005$), as well as the increase from somewhat slow to just right (118.99,

95% CI [56.68, 181.30], $p < .005$). However, there was insufficient significance between too slow and somewhat slow ($p = .995$). Observed power was .997 overall. See Tables 26, 27, and 28 for results. This lack of significance suggested an unexpectedly significant finding as well, in that only the completely mentally fit youth were likely to receive a lifesaving transplant, even though they had only moderate cognitive impairment and had a lifetime of biological potential to offer.

The hypothesis for the second research question tested whether candidates whose mental age was too slow or somewhat slow had significantly longer transplant wait times compared to those who were just right. The group means were significantly different ($p < .05$), therefore, the second null hypothesis could be rejected. The results appear in Tables 26, 27, and 28.

Table 26

Mental Age Welch ANOVA Means and Standard Deviations

Age Group	*N* (orig.)	Mean Wait	*SD*
TooSlow	300 (73)*	371.92	420.09
SomeSlow	300 (113)*	369.01	350.94
JustRight	300 (391)*	250.02	296.33

Note. * indicates numbers in parentheses are the original cell counts before standardizing.

Table 27

Mental Age Welch ANOVA Results

Age Group	Statistic[*]	*df1*	*df2*	*F*	Sig.
Between Groups		2		11.24	.000
Within Groups		897			
Welch	13.50	2	586.56		.000

Note. * indicates asymptotically *F* distributed.

Table 28

Mental Age Games-Howell Comparisons

					95% Confidence Interval	
MentAge	Level	Mean Difference	*SE*	Sig.	Lower Bound	Upper Bound
TooSlow	SomeSlow	2.91	31.60	.995	-71.35	77.17
	JustRight	121.90*	29.68	.000	52.15	191.66
SomeSlow	TooSlow	-2.91	31.60	.995	-77.17	71.35
	JustRight	118.99*	26.52	.000	56.68	181.30
JustRight	TooSlow	121.90*	29.68	.000	191.66	-52.15
	SomeSlow	118.99*	26.52	.000	181.30	-56.68

Note. * indicates that the mean difference is significant at the 0.05 level.

Research question 3. The third research question asked whether physical age fitness (physical age) or mental age fitness (mental age) had more influence on the delay before receiving a transplant. Such a bias might indicate mental favoritism in the criteria. The null hypothesis was this:

H3$_0$: Physical age and mental age do not interact to predict significantly longer transplant wait times.

The focus of this question was to look for an interaction between the two independent variables, and if an interaction were found, might suggest a more complex explanation than the main effects could explain (for instance, certain combinations of the three levels of the two independent variables). To address this question in light of the questionable assumption of homogeneity of variance (see Tables 9, 11, and 15), the data were arranged into four logical categories, representing a truth table given two dichotomous factors (mental or physical, transplant or no transplant), equivalent to the two independent variables but testable as one independent variable. This allowed a third one-way Welch ANOVA to be performed to look for an interaction, followed by a Games-Howell *post hoc* as before. The independent was labeled Fitness and the four levels were labeled physical quotient high and low, and intelligence quotient high and low (PQ-Hi, PQ-Lo, IQ-Hi, and IQ-Lo) corresponding to the four possible outcomes. A third one-way Welch ANOVA was then conducted on transplant fitness, to determine if the transplant wait times were different for kinds of fitness. The normal distributions and outliers had already been checked in the two previous Welch ANOVA tests, and heterogeneity of variance was assumed ($p < .005$ as shown in Table 19). Wait times increased from IQ-Hi ($M = 250.02$, $SD = 296.33$), to IQ-Lo ($M = 370.47$, $SD = 386.74$), to PQ-Lo ($M = 518.15$, $SD = 610.59$) to PQ-Hi ($M = 776.80$, $SD = 799.31$) transplant fitness groups, in that order. There was a statistically significant difference between groups, Welch's $F(3, 819.03) = 53.97$, $p < .0005$, $\omega^2 = 0.08$. Games-Howell *post hoc* analysis revealed significance for all combinations of the independent variable ($p < .005$), for example between IQ-Hi and IQ-Lo (-120.45, 95% CI [-180.39, -60.50]), and between IQ-Lo and PQ-Lo (-147.68, 95% CI [-223.61, -71.75]), and between PQ-Lo and PQ-Hi (-

258.66, 95% CI [-393.88, -123.44]). Observed power was 1.000 overall. See Tables 29,

30, and 31 for results.

Table 29

Physical/Mental Age Welch ANOVA Means and Standard Deviations

Age Group	*N* (orig.)	Mean Wait	*SD*
PQ-lo	300 (17,397)*	518.15	610.59
PQ-hi	300 (68,320)*	776.80	799.31
IQ-lo	300 (186)*	370.47	386.74
IQ-hi	300 (391)*	250.02	296.33

Note. * indicates numbers in parentheses are the original cell counts before standardizing.

Table 30

Physical/Mental Age Welch ANOVA Results

Age Group	Statistic*	*df1*	*df2*	*F*	Sig.
Between Groups		3		56.54	.000
Within Groups		1799			
Welch	53.97	3	819.03		.000

Note. * indicates asymptotically *F* distributed.

Table 31

Physical/Mental Age Games-Howell Comparisons

Fitness	Contrast	Mean Difference	SE	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
PQ-lo	PQ-hi	-258.66*	52.45	.000	-393.88	-123.44
	IQ-lo	147.68*	29.51	.000	71.75	223.61
	IQ-hi	268.12*	30.23	.000	190.31	345.94
PQ-hi	PQ-lo	258.66*	52.45	.000	123.44	393.88
	IQ-lo	406.33*	48.77	.000	280.46	532.21
	IQ-hi	526.78*	49.22	.000	399.78	653.78
IQ-lo	PQ-lo	-147.68*	29.51	.000	-223.61	-71.75
	PQ-hi	-406.33*	48.77	.000	-532.21	-280.46
	IQ-hi	120.45*	23.28	.000	60.50	180.39
IQ-hi	PQ-lo	-268.12*	30.23	.000	-345.94	-190.31
	PQ-hi	-526.78*	49.22	.000	-653.78	-399.78
	IQ-lo	-120.45*	23.28	.000	-180.39	-60.50

Note. * indicates that the mean difference is significant at the 0.05 level.
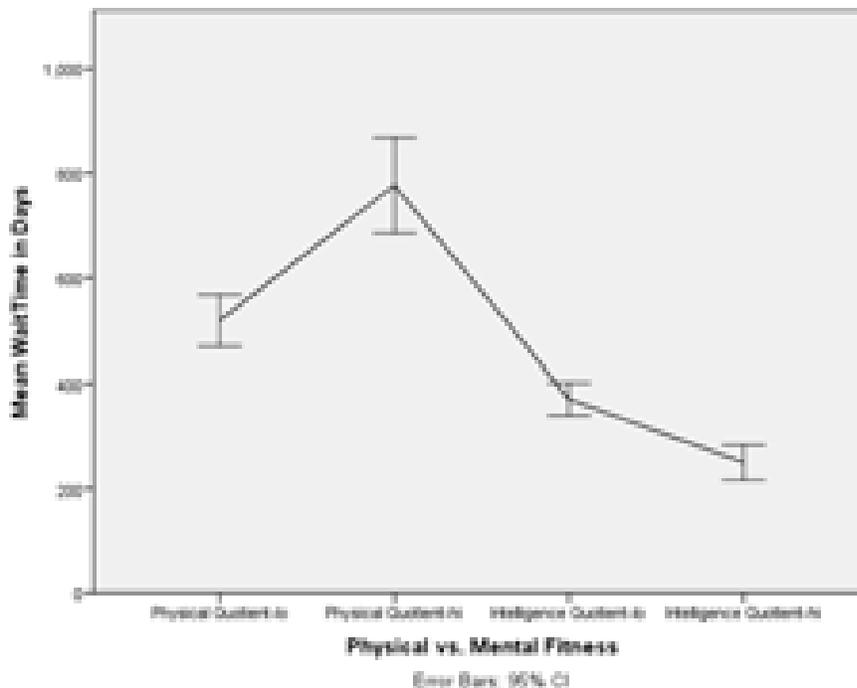
Figure 4. Means plots for wait times interactions.

The hypothesis for the third research question tested whether physical age (physical age fitness) and mental age (mental age fitness) interacted in some way, and thus predicted significantly longer transplant wait times among groups of candidates. The group means were all significantly different ($p < .05$), therefore, the third null hypothesis could be rejected. The strength of the results of this final Welch ANOVA suggested significant favor for mental fitness (with the lowest mean wait time combinations by far) when determining the priority of kidney organ allocation.

Summary

This section presented descriptive information about the data collected for this research, followed by analysis and results of that analysis. The sample population ($n = 17,914$) consisted of first time recipients of kidney transplants for the year ending December 31, 2014, from among a much larger number of candidates on the transplant

waiting list (N = 88,231). The data were summarized using the descriptive analysis

feature of IBM© SPSS® version 24. Limitations were also discussed, including

consideration that the number of persons with end stage renal disease was much higher

than those that meet the criteria for the kidney waiting list (678, 383), suggesting that

wait times for groups that do not meet the criteria are not included. The assumptions for

factorial ANOVA were reviewed, and all assumptions except homogeneity of variance

were met. The generation of raw data scores based on the Box-Muller transform (to

balance the cell sizes), and the performance of three separate one-way Welch ANOVAs

allowed analysis in SPSS®, agreeing with the summary statistics provide by the USRDS.

A one-way Welch ANOVA was first conducted on physical age, to determine if

the transplant wait times were different for groups of different physical ages. Wait times

increased from too young (M = 250.02, SD = 296.33), to just right (M = 776.80, SD =

799.31), to too old (M = 786.27, SD = 717.51) physical age groups, in that order, showing

significance between too young and just right, and between too young and too old,

Welch's $F(2, 494.46)$ = 113.71, p < .0005. However, there was insufficient significance

between just right and too old (p = .987). The group means were significantly different (p

< .05) but not in the direction hypothesized, therefore, the first null hypothesis could not

be rejected. However, the results suggested significant differences pertaining to the

question, in that the age just before the just right age group, if both mentally and

physically fit, seemed to be favored by significantly lower wait times, between age

groups and within the youngest age group.

A one-way Welch ANOVA was then conducted on mental age, to determine if the

transplant wait times were different for groups of different mental ages. Wait times

increased from just right ($M = 250.02$, $SD = 296.33$), to somewhat slow ($M = 369.01$, $SD = 350.94$), to too slow ($M = 371.92$, $SD = 420.09$) mental age groups, in that order, showing significance between too slow and just right, and between somewhat slow and just right, Welch's $F(2, 586.56) = 13.50$, $p < .0005$. However, there was insufficient significance between too slow and somewhat slow ($p = .995$). The group means were significantly different ($p < .05$), therefore, the second null hypothesis could be rejected.

The testing of the third hypothesis was accomplished by arranging the data into four logical categories, representing a truth table given two dichotomous factors (mental or physical, transplant or no transplant), equivalent to the two independent variables but testable as one independent variable. This allowed a third one-way Welch ANOVA to be performed to look for an interaction without adversely affecting *alpha*, followed by a Games-Howell *post hoc*. A third one-way Welch ANOVA was then conducted on transplant fitness, to determine if the transplant wait times were different for kinds of fitness. Wait times increased from IQ-Hi ($M = 250.02$, $SD = 296.33$), to IQ-Lo ($M = 370.47$, $SD = 386.74$), to PQ-Lo ($M = 518.15$, $SD = 610.59$) to PQ-Hi ($M = 776.80$, $SD = 799.31$) transplant fitness groups, in that order, showing significance for all combinations of the independent variable, Welch's $F(3, 819.03) = 53.97$, $p < .0005$. The group means were all significantly different ($p < .05$), therefore, the third null hypothesis could be rejected. The strength of the results of this final Welch ANOVA suggested significant favor for mental fitness (with the lowest mean wait time combinations by far) when determining the priority of kidney organ allocation. A matching set of standard ANOVAs followed by Tukey's *post hoc* tests were then performed to verify the results of the Welch

ANOVAs and Games-Howell *post hoc* tests, although the standard ANOVA retests were presented first in case readers might be unfamiliar with the Welch ANOVA approach.

To summarize, Chapter 4 described the data analysis procedures and findings for this study using narrative text, tables, and figures. The results described sufficient information in answer to the original hypotheses and research questions that guided the direction of this research. A discussion of the findings and tentative conclusions reached by the principal investigator are presented in Chapter 5, along with the implications and some recommendations of this research and its findings.

Chapter 5: Summary, Conclusions, and Recommendations

Fugit infantia, fugit pueritia, fugit adolescentia, fugit juvenius, fugit senectus:

et hodie non est, qui heri fuit

Infancy flees, childhood flees, adolescence flees, youth flees, old age flees:

and nothing remains today that was here yesterday

Jacques Marchant, 1646, p. 129

Introduction

The purpose of this study was to compare groups of candidates on the waiting list for a kidney transplant to test whether some groups waited significantly longer to receive a lifesaving kidney than other groups due to a physical or mental assessment bias. Although research had been conducted showing bias against older candidates (ageism), and younger candidates (ableism), research to date could not be found asking whether those primarily outside an ideal physical and mental age (e.g. under 18 or over 65) must wait longer to receive a kidney due to a physical or mental assessment bias (Grams et al., 2012; Wightman et al., 2014). If so, even though wait time remains the key determinant of premature death from renal disease, some groups have waited longer than others, dying prematurely because they were inadvertently neglected by a practical need for candidate assessment in the competition for scarce kidneys (Center for Bioethics, 2004). This research was deemed important because the United Nations has declared that "all human beings are born free and equal in dignity and rights" yet there seemed to be a circumvention of equal dignity in the form of favored traits, during the practical allocation of scarce kidney organs (United Nations, 1948, para. 9).

This study tested whether these group differences corresponded to an assessment bias, and found that they do correspond. A causal-comparative design was used because the purpose of this research was to analyze measurements taken from an existing population (potential recipients of kidney organs). Those measurements were requested from an existing data set already in a form suitable for after-the-fact (causal-comparative), quantitative analysis. During the design of the study, it was believed that there would be significant group differences such that the wait times of favored groups (e.g. the mentally superior) would be shorter than others (e.g. the mentally impaired). These same self-assessments (achieve superiority or face inferiority) were made famous by Erik Erikson and James Marcia as the psychosocial crises needed to achieve social belonging and look back at a life worth living (Kivnick & Wells, 2014; Stone et al., 2013).

As to scientific and societal value, identification of mental age bias within the professionally difficult kidney allocation process highlights a paradox in the health industry's attempt to ethically accomplish what may be an unethical thing. That unethical thing, though meant well, might be civilization's invention of an industry that harvests and grafts living organs between human beings, while screening out the mentally inferior and extending the lives of those fortunate enough to possess measurably superior mental fitness. Such a practice might represent inadvertent violations of the Universal Declaration of Human Rights by the organ allocation and candidate assessment industries, during the difficult process of ethically selecting a subset of those in dire need, which dearly purchased declaration sought to end such thoughts and to discourage such practices (United Nations, 1948). This chapter will present the conclusions drawn from

this study and its analysis of the collected renal candidate data, contemplate the implications, and suggest recommendations for future research.

Summary of the Study

End stage renal disease always ends in loss of life, and though medical science can delay death, many perish while waiting for the only known cure—a replacement kidney. The fundamental problem is that there are far more people who need a kidney than there are organs, creating an ethical conundrum as to whom should survive and whom should not (Patzer, 2011). Inevitably, those who receive an organ will feel very valuable, while those who are refused an organ will feel society does not value them at all (Ubel & Loewenstein, 1996). This research study was important to conduct, because psychologists try very hard to help people feel their lives were valuable and to realize that no one ever lives life in vain, and here was a human healthcare industry that paradoxically makes that difficult for both humanitarian psychologists and the dying persons human psychologists treat (Frankl, 1990).

Two pieces of empirical evidence suggested that there were ideal physical and mental age groups involved in the candidate assessment process. One, the elderly (too old) being of advanced physical age, had been shown to be less likely to receive life-saving kidneys than those who were just right, despite lifelong contribution and continuing fitness (Curtis, 2006; Grams et al., 2012). Two, the very young with delayed mental fitness (too slow, or even somewhat slow) had been shown to be unlikely to receive life-saving kidneys, despite the most promising (the longest) biological future (Derrington et al., 2016; Wightman et al., 2014). It was hypothesized that an analysis of the shortest wait times of candidates on the kidney waiting list would highlight, *ceteris*

paribus, those assessed as most able of any human to host the survival of one of the scarce organs—and, perhaps, those ideal candidates were deemed superior in general. This study investigated this evidence and found significance.

Chapter 1 of this research study outlined the purpose, background, framework, and research questions involved. The first research question asked whether candidates whose physical age was less than (too young) or greater than (too old) the just right group waited significantly longer for a kidney. This question sought evidence of physical age bias in the allocation of scarce organs. The second research question asked whether candidates whose mental age was much less than (too slow) or somewhat less than (somewhat slow) the just right group waited significantly longer for a kidney. This question sought evidence of mental age bias in the allocation of scarce organs. The third research question asked if there were an interaction between physical age and mental age that predicted longer wait times for a kidney. This question sought evidence of a *cognitive bias* (mental favoritism) when all other criteria were (more or less) equal.

Chapter 2 described the breadth of literature to date concerning the evolution of models of prejudice, leading to a research model called the mental favoritism model (MFM) which describes a bias for *mental aptitude* over *biological viability* (see Figure 3 in Chapter 2). This view of categorical prejudice describes a social bias that has arisen from the human need to discriminate between basically similar things—especially during resource sparsity (Burgers, 2016). This chapter also detailed the current research problem (too many people and not enough organs), the resulting prejudice (a preference for the intellectually fit), the paradoxical past (a history of trying to reduce too many people to a practical number), and the researcher's premise (assessment bias). This premise was then

embodied in a model eerily similar to models of the human competition for social status and group warmth (see Figure 6 in Appendix H, the intellectual stereotype model or ISM). Finally, this chapter provided a background on relevant concepts such as a longitudinal history of grafting (mating) living things to create preferential outcomes or to extend the lives of the few, the societal exclusion of those with certain unfavored traits, and the battle between the application of distributive justice versus the uncanny justice of random selection. The chapter closed by outlining the paradox of struggling to gradually guarantee human rights to all humans (legal in lieu of universal justice), versus a possibly fairer and less blame-prone natural justice known only as *natural selection* (Berry, 2016; Darwin, 1876).

Chapter 3 of this research study described the design and methodology used. This chapter explained the appropriateness of the research design and of the research methodology for the stated purpose of the study. This study used a quantitative method with a causal-comparative design to compare groups of active candidates on the waiting list for a kidney transplant in the U.S. Renal Data System for the year ending December 31, 2014. This method was chosen because the data for this research consisted of secondary data in national repositories of organ transplant data which had already been collected (*ex post facto*). As a result, the principal investigator could not manipulate the physical and mental conditions present in the fixed data (Bleske-Rechek et al., 2015; Ejima et al., 2016). The principal investigator submitted a formal data request to the program director of the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), per instructions from the USRDS project manager. The request for staff time was kindly approved and a spreadsheet containing detailed, anonymous, summary data

were returned, corresponding to the specific data sample for this study. Chapter 3 also described the procedures that would be employed to analyze the requested data.

Chapter 4 described the collected data, the procedures employed to analyze that data, and the results of statistical analysis of that data. The data were analyzed using IBM© SPSS® version 24 which initially produced descriptive statistics and then group comparisons via Welch ANOVAs and Games-Howell *post hoc* comparisons. These procedures helped describe the sample population, address the assumptions needed to perform parametric procedures, adapted as needed to meet those assumptions, and examined the results of those group comparisons. These results then became the basis of answering the research questions and their corresponding hypotheses, and the basis from which implications and recommendations could be formulated.

This chapter articulates the findings from Chapter 4 via a summary and interpretation of those findings by the researcher. These are followed by conclusions as to the theoretical, practical, and future implications of this study. Tentative recommendations for future research and practice are then presented.

Summary of Findings and Conclusion

Before conducting a full analysis of the data guided by three research questions and null hypotheses, a statistical description of the sample population was needed to better guide interpretation of the group comparisons. The sample data returned by the USRDS was found to agree very closely with the data reports published annually and made available to researchers and similar interests, which reports have demonstrated validity and reliability in compliance with federal, state, and local guidelines (ESRD Surveyor Training Interpretive Guidance, 2008; U.S. Renal Data System, 2016). Also

provided were generous footnotes for the researcher addressing questions about the data—allowing alignment with the aims of the study and explanations of possible discrepancies. Of primary note (see Table 2 in Chapter 4) were the percentages for candidate and recipient representation regarding those age groups especially analyzed by this study (0 to 17, 18 to 64, and 65 or older).

Findings about the candidates. Most candidates were from the just right age group (18 to 64) which included working age persons, representing 80% of the sample population. The next largest group was the too old age group (65 or older) representing 19% of the sample population. The smallest group was the too young age group (18 or under) representing 1% of the sample population. After adjustment for group size differences, the just right age group represented 60% of candidates while the too old group represented 38% and the too young age group represented about 2%. The large representation of the just right age group may be explained in part by the wider range of years it covers. However too, this is somewhat mediated by census data suggesting the general population is much older as of 2014 (Rowe, Fulmer, & Fried, 2016; Tonelli & Riella, 2014). As the "baby boomer" generation reaches retirement age, the elderly should also have a larger representation in the allocation system, whereas that representation is getting smaller (Grams et al., 2012). The poor representation of candidates under age 18 may be explained in part by the lower likelihood of developing ESRD during childhood, yet, paradoxically, that representation is getting larger, suggesting the favoring of predicted contribution (the young) over evidence of contribution (the aged).

Findings about the recipients. Adjusting for discrepancies, most recipients of a replacement kidney who had been on the waiting list for this period were from the just right or working and insured age group, representing 79% of the sample population. The too old age group of humans beyond the threshold of typical working age represented only 17% of the sample population, and the too young age group represented a surprisingly larger 4% of the sample population compared to the proportion of candidates in that group. After adjustment for group size differences, the just right age group still represented 59% of kidney recipients with the too old group accounting for only 34% and the too young age group accounting for a surprising 7% recipients compared to 2% candidates (more candidates than the waiting list suggested). The logical reason that recipients under 18 were so well represented beyond the odds of being chosen may be explained by a new imperative in 2014 prioritizing the young in the renal data system allocation program (Chopra & Sureshkumar, 2015). From these summary figures, it can already be seen that the just right age group (and the young most likely to contribute to that age group) were favored in the allocation of scarce kidneys for the year ending December 31, 2014; however more detailed analyses were needed to bear out these distribution anomalies.

Findings about the research questions. Two independent categorical variables (physical age and mental age) and one dependent continuous variable (transplant wait time) were used to answer the three research questions asked by this study. Three Welch ANOVAs were conducted using IBM© SPSS® version 24 by means of validated, reliable summary data from the USRDS which had been aggregated into the age groups being compared. These were followed by Games-Howell *post hoc* tests to illuminate which

group differences might have had the most significant influence. The Welch ANOVAs were then retested by a set of standard ANOVAs and corresponding Tukey's *post hoc* analyses.

The first research question asked whether a physical age bias were involved in the delay before receiving a transplant. Such a bias might indicate bias in the criteria. The null hypothesis was this:

H1$_0$:   Candidates whose physical age is too young or too old do not have

significantly longer transplant wait times compared to those who are just right.

This question compared wait times between physical (chronological) age groups, to see if a bias existed with respect to the candidate's physical age as suggested by Grams et al. (2012). A one-way Welch ANOVA was conducted for physical age, to determine if the transplant wait times were different for groups of different physical ages. Transplant recipients were classified into three age groups: too young ($n = 674$), too old ($n = 3,294$), and just right ($n = 13,694$). Wait times increased from too young ($M = 250.02$, $SD = 296.33$), to just right ($M = 776.80$, $SD = 799.31$), to too old ($M = 786.27$, $SD = 717.51$) physical age groups, in that order, even though the groups with the longer wait times had far more candidates in need of a kidney. There was a statistically significant difference between groups, Welch's $F(2, 494.46) = 113.71$, $p < .0005$, $\omega^2 = 0.13$. Games-Howell *post hoc* analysis revealed that the mean increase from too young to just right (-526.78, 95% CI [-642.59, -410.97]) was statistically significant ($p < .005$), as well as the increase from too young to too old (-536.25, 95% CI [-641.68, -430.81], $p < .005$). However, there was insufficient significance between just right and too old ($p = .987$), suggesting an emphasis on selecting young over old candidates.

The hypothesis for the first research question tested whether candidates whose physical age was too young or too old had significantly longer transplant wait times compared to those who were just right. The group means were significantly different ($p <$ .05) but not in the direction hypothesized, therefore, the first null hypothesis could not be rejected. However, the results suggested significant differences pertaining to the question, which were perhaps more favorable to the overall purpose of the study. The age just before the just right age group (a category that might have been labeled "just before" instead of too young), when candidates were both mentally and physically fit, was favored by significantly lower wait times (this phrase has been added to the section entitled Definition of Terms). This physical favoritism (labeled ageism when applied to the elderly) was statistically significant between age groups (too young, too old, and just right) and within the youngest age group (too young). As the age which had contributed would be expected to have more persons deserving of replacement kidneys, yet the proportion of scarce kidneys was allocated to the age before contribution, a favor for those of future value over those of past value was significantly suggested. This was also supported by a news item from the assessment and allocation industries in 2014, suggesting a new prioritization of the pre-industrial youth, despite an aging population (Chopra & Sureshkumar, 2015).

The second research question asked whether a mental age bias were involved in the delay before receiving a transplant. Such a bias might indicate bias in the criteria. The null hypothesis was this:

H2$_0$:   Candidates whose mental age is too slow or somewhat slow do not have

significantly longer transplant wait times compared to those who are just right.

This question compared wait times between mental age groups (those of impaired or unimpaired cognition), to see if a bias existed with respect to the candidate's assessed mental age, especially for unemancipated youth either likely or unlikely to achieve personal industry (labeled industry versus inferiority in Erikson's psychosocial stages). This had been suggested by Wightman et al. (2014). A Welch ANOVA was performed using IBM© SPSS® version 24 to compare the mean wait times between groups of varying cognitive ability under 18 years of age to determine if the transplant wait times were different for groups of different mental ages. Transplant recipients were classified into three groups: too slow ($n = 674$), somewhat slow ($n = 3,294$), and just right ($n = 13,694$). Wait times increased from just right ($M = 250.02$, $SD = 296.33$), to somewhat slow ($M = 369.01$, $SD = 350.94$), to too slow ($M = 371.92$, $SD = 420.09$) mental age groups, in that order. There was a statistically significant difference between groups, $F(2, 586.56) = 13.50$, $p < .0005$, $\omega^2 = 0.02$. Games-Howell *post hoc* analysis revealed that the mean increase from too slow to just right (121.90, 95% CI [52.15, 191.66]) was statistically significant ($p < .005$), as well as the increase from somewhat slow to just right (118.99, 95% CI [56.68, 181.30], $p < .005$). However, there was insufficient significance between too slow and somewhat slow ($p = .995$). Observed power was .997 overall.

The hypothesis for the second research question tested whether candidates whose mental age was too slow or somewhat slow had significantly longer transplant wait times compared to those who were just right. The group means were significantly different ($p < .05$), therefore, the second null hypothesis could be rejected. This finding was important in establishing a possible prioritization of mental fitness over physical fitness, since the

youngest age group was by physical standards more physically fit than the old, yet the

discriminating factor among this group was mental fitness instead of physical fitness. The

much smaller size of this group, as well, should have resulted in very insignificant

differences between candidates (since the group overall was very small, and all

candidates shared physical youth). Yet the selection of cognitively and academically

unimpaired candidates over other candidates of similar age was very pronounced.

Sources suggest that, even at the dawn of life, these children are confronted with

premature death and lack of access to vital healthcare resources, despite physical viability

greater than those of working class or retired persons (Long, 2015). The neglected

families—not just the neglected children—of these children assessed as mentally

impaired (labeled ableism when the young are excluded from equal rights) also face

unusual challenges and lifelong grief, as well as a sense of lack of value to society. The

potential reason for this unusual discrimination is that, indirectly, the families (genes) of

other groups have been prioritized over these families, and now these nuclear families

feel abandoned by their society (Kim et al., 2016; Long, 2015).

The third research question asked whether physical age fitness (physical age) or

mental age fitness (mental age) had more influence on the delay before receiving a

transplant. The stronger influence might indicate greater mental bias than physical bias in

the criteria. The null hypothesis was this:

H3$_0$:   Physical age and mental age do not interact to predict significantly longer

transplant wait times.

This question asked which variable (physical fitness or mental fitness) affected

mean wait time for a transplant the most, and might therefore be the most favored trait. A

one-way Welch ANOVA was conducted on transplant fitness, to determine if the

transplant wait times were different for kinds of fitness. Wait times increased from IQ-Hi

(M = 250.02, SD = 296.33), to IQ-Lo (M = 370.47, SD = 386.74), to PQ-Lo (M = 518.15,

SD = 610.59) to PQ-Hi (M = 776.80, SD = 799.31) transplant fitness groups, in that

order. There was a statistically significant difference between groups, Welch's F(3,

819.03) = 53.97, p < .0005, ω^2 = 0.08. Games-Howell *post hoc* analysis revealed

significance for all combinations of the independent variable (p < .005), for example

between IQ-Hi and IQ-Lo (-120.45, 95% CI [-180.39, -60.50]), and between IQ-Lo and

PQ-Lo (-147.68, 95% CI [-223.61, -71.75]), and between PQ-Lo and PQ-Hi (-258.66,

95% CI [-393.88, -123.44]). Observed power was 1.000 overall.

The hypothesis for the third research question tested whether physical age

(physical age fitness) and mental age (mental age fitness) interacted in some way, to

predict significantly longer transplant wait times among groups of candidates. The group

means were all significantly different (p < .05), therefore, the third null hypothesis could

be rejected. The strength of the results of this final Welch ANOVA suggested significant

favor for mental fitness (with the lowest mean wait time combinations) when determining

the priority of kidney organ allocation. What was most intriguing about these findings,

was an unexpected ordering of mental and physical fitness combinations. Those with

high mental fitness had the lowest wait times, followed by those with low mental fitness

(not high physical fitness). Next were those with low physical fitness, followed by those

with high physical fitness (which was also surprising). These strongly suggested that it

was actually a *disadvantage* to be part of the largest normative group (physically fit)

because their chances for a kidney were *reduced* by the size of that group. The irony of

having to wait longer due to greater fitness was an almost overwhelming finding. This seemed to explain why the low physical fitness group had a lower wait time than the high physical fitness wait time, which was otherwise anomalous. In the same way, this explained why low mental fitness was still an advantage for candidates over physical fitness (because all candidates were first screened for physical factors, then mental factors—to make the waiting list—so that all candidates had physical fitness and were thus less likely to get a kidney based on being in the largest group that met the criteria).

This was a surprising finding, and fortuitously supported the tentative evidence in the literature review suggesting random (non-mental) selection may be fairer than expert (mental) selection due to the disproportionate number of fit candidates and fit organs. As the number of qualified candidates increased, random selection increased the chances of those in the largest segment of the population in the struggle for survival. This natural law of diminishing gains has a presence in scientific literature as *biological equilibrium* and *biophysics* (Roy, Locky, Azeria, & Schieck, 2017).

Conclusions. Three research questions and their associated hypotheses were answered by this study about industry versus inferiority in the competition for scarce kidneys. Not all of the null hypotheses were successively rejected, yet the findings were perhaps even more significant as a result. These somewhat unexpected findings may be summarized under three key concepts, each related to one of the three original research questions.

Principle 1: The irony of physical age criteria. The first research question found that the age just before the just right age group (if mentally equipped) had the shortest wait times (a group formed by mental and physical conditions, comprised of the best

future qualities, not past or present qualities). Those aged 18 to 64 (the just right age group) were less likely to get a rare kidney (even though they were just right) because the group size was too large for its individuals to be noticed. Those aged 65 and over were less likely to get a kidney because their abilities would never recover, and thus were predicted to be a worse investment. Those aged 0 to 17 were likely, but if and only if they exhibited unimpaired mental and academic capacity (if they were a good investment).

As a result, the priority for allocation of scarce kidneys was focused just before (not during) the ideal age group (just prior to the just right physical/chronological age group). This was followed by those fully engaged in and contributing to society, followed by those who had contributed to society but no longer could. This was surprising because the fastest growing segment of the ESRD population (the elderly—the group of potentially and evidentially greatest individual contribution and size) has the lowest priority, which seems paradoxical (Grams et al., 2012). However, this finding proved very beneficial to the purpose statement of this study—because it seemed to represent even better evidence of assessment bias (favoritism) than hypothesized. To explain, even though a rights-centered allocation strategy would suggest the elderly (having dedicated their lives to society) would in turn receive top priority and the shortest wait times (similar to first right of refusal in business or honoring returning veterans), the current strategy realized the better investment in terms of organ survivability was the age just before the predicted ideal (Ozmel, Yavuz, Reuer, & Zenger, 2017). There are very few organs and it is the responsibility of the allocation community to expedite their distribution wisely (e.g. to the most mentally capable and longest physically surviving candidates). Contrary to expectation, however, that requires adopting a strategy so that

more organs survive than candidates, and (potentially) survive longer than most candidates. That, in turn, requires gradually shifting allocation to the predictably fit, not the currently fit. This leads to the second concept, another concept of paradoxical significance.

Principle 2: The irony of mental age criteria. The second research question found that, among the youngest candidates, those who could better mentally (psychologically) host a replacement organ were significantly preferred over those who could better physically (biologically) host the organ and its survivability. This favor for mental fitness, among the group with the longest physical future ahead of them, was very surprising. The children not selected for a kidney would be faced with premature death at the dawn of life, mainly due to cognitive deficits—not from physical illnesses survivable by the technology to treat the illness, nor for want of social support systems to scaffold the survival of living children (Long, 2015; Wightman et al., 2014). This finding greatly suggested that the organ (a commodity) was eventually being prioritized over human children and adults in need of that organ, and that the most efficient criteria, as the proportion of candidates to organs widens, must inevitably screen out those without the best ability to (mentally) take care of that organ.

Few would question that, faced with the decision between the life of a human being and that of a human organ, the general public would favor the human being (Ubel & Loewenstein, 1996). Notwithstanding, the findings of this research suggest that when the supply of human organs is greatly outweighed by the number of candidates that need one, the survival of the organ is plainly favored. This can also be seen in the analysis of survival factors post transplantation, which gauge is primarily *graft loss*, because despite

any other factor, analysis of what contributed toward or against the survival of the graft seems a better measure of an ethical allocation of precious resources (Naesens et al., 2014). As the human population continues to grow exponentially (the unnatural growth of the number of the needy), along with longer lifespans (the unnatural demand to extend the duration of that unusual frequency of need), this aberrational view of the superior value of a human organ relative to inferior human candidates must inadvertently intensify, while the burden on healthcare professionals to develop ever more critical criteria must also intensify.

This ethical paradox of the need to value a scarce human commodity over the human beings that need that commodity, evinces an uncanny exchange (swapping) of the fundamental unit of value of that civilized system, as the industry of the management of that unit of value begins to successfully bloom. Intriguingly, this is also what happens with non-human *algal blooms* which are also the result of human intervention in natural systems, resulting in the extinction of ecological communities (Michalak et al., 2013). This researcher does not propose that the expert community (whose concern for the greater good is clear and present), values commodities over humanity. Rather, as the need to practice compassion and meet human rights criteria is exceeded by the intellectual technology to preserve human life, the asymptotic result surprisingly requires that the selection criteria focus on the survival of scarce living organs (industrial commodities), to (ironically) best represent the greater good of human beings. Ubel and Loewenstein (1996) also noted a similar finding, and that finding eventually became the inspiration for this study.

Principle 3: The irony of fitness criteria. The third research question was

perhaps, most surprising of all. The sequence of groups favored by the lowest wait times

did not result in the just right group having the shortest overall wait. Wait times increased

from the highest mental fitness, to the lowest mental fitness, to the lowest physical

fitness, to the highest physical fitness, as can be seen in Figure 4. Analysis and

interpretation of the logic beneath this last finding however, was not difficult to arrive at,

and very understandable in the end. There is another unexpected paradox in improving

public health and longevity to the point of what is commonly called *saturation*, at which

point "gains" begin to become "losses" (Hollmann, Jarvis, & Bitner, 2015). This concept

is made evident in that, even though logic would suggest being among the most fit would

result in the best odds of receiving a transplant, the findings of this study suggest the

opposite. Candidates in the largest groups have the lowest odds, even though that group is

deemed just right. When so, those which are too young and somewhat slow have better

odds of a transplant than those who are just right. This helps explain the illogical order of

the wait times—where they seem illogical, the size of the group is too large for each fit

individual to be noticed, which ironically argues against the effort to increase group

fitness when resources are scarce. At this tipping point, quite similar to the *law of

diminishing returns* in business, the level of gain (which had once been more and more of

what was worked for and hoped for), begins to become less and less of what was worked

for and hoped for. At such a juncture, it becomes advantageous to be less fit, and thus

have greater odds of being selected due to being in a group of smaller size (Kahneman &

Deaton, 2010).

Implications

The findings of this study have some theoretical, practical, and future implications. As these implications seem to warrant some explication, these will be presented in the following sections and subsections. Overall, the implications strongly suggested unwinnable struggles to improve on a natural design.

Theoretical implications. The theoretical implications are very similar to accepted theories in other disciplines, for example the law of diminishing returns seems to be valid in the area of natural versus legal justice as well, and there seems to be a second struggle for existence which is occurring, but not between biological species. That struggle is mutual and manifest, and seems aimed at an endless variety of uninhibited biological expression (Darwin, 1876). This struggle seems to be between a single amensal/intellectual species and the endless biological species being extinguished by it, which struggle is neither mutual nor manifest. This mental struggle seems aimed at the privatization of mutually needed phenomena—in the form of inner lingual narratives and external verbal *mands*, both of which exact reverence from (and deny reverence for) their underlying and surrounding biology (Gibbons et al., 2000; LaMothe, 2010; Sundberg, 2016; Wanderer, 2015). These theoretical implications appear in the following.

The law of diminishing justice. The conclusions of this research study discussed the irony of struggling to improve upon natural outcomes using technology and criteria. Perhaps, extending those principles of the irony of physical criteria, mental criteria, and fitness criteria, this study implies an underpinning paradox of trying to improve upon a natural design (Berry, 2016; Darwin, 1876; Keys, 2014). This paradox could be stated:

- Premise 1: If what is initially more just to introduce (in a selective sense), but which decisions console humanity only when the number of judgments are few

- Premise 2: And if that is less just to uphold (in a universal sense) by making humanity regret those decisions when the number of judgments eventually becomes too great

- Conclusion: Then the paradox of decision is like a law of diminishing justice, initially enacted to try and circumvent a natural law by introducing selective justice into a natural system

As Kahneman and Deaton (2010) discovered in the relationship between high-income and well-being, so too this same phenomenon seems to be the relationship between competence and warmth, between legal justice and natural justice, and between industry and humanity. As the criteria, so carefully and dearly purchased, reach a limit of legal justice, they begin to deviate from what may only be termed the universal justice they tried to circumvent (Berry, 2016). Inevitably, it will become fairer to hold a lottery (which is what the *randomized control trial* or RCT goal is anyway), and thus engender less lasting blame against those who decided for others, less lasting regret inside those who had to decide for others, and fewer issues of the violation of human rights among those groups ultimately excluded in the struggle for protracted group existence (Long, 2015). Other studies have affirmed this finding for end-of-life decisions already, in that the ability to psychologically survive making end-of-life decisions for loved ones is aided mainly when their attachments do not have to make them (Roeland et al., 2014). Relief is evident when they are made by some other means other than making such decisions incumbent upon those with the highest stake in an (affectively) unwinnable outcome. As this natural affordance already exists in natural systems under the term *chance* (the margin of watched outcomes unexplained by controls) it seems antithetical to try and improve upon the concept (i.e. to try and "control" the generation of "random" outcomes).

Mercy for mental life vs. biological life. Originally, this researcher set out to study the possibility that human thoughts and human works (mental life, commonly referred to as cognitions) were being revered over living things (biological life, commonly referred to as Nature or Creation in the vernacular). This research question was inspired because a study of the literature deeply suggested that, when everything else is equal, the survival of human Ideas (mental life) seems more important to Civilization than the survival of living beings (biological life) from which human ideas come to be inspired (Berns et al., 2012; Gilhus, 2006; Jong, Kavanagh, & Visala, 2015; LaMothe, 2010; Wanderer, 2015). This research study about the struggle to extend human life with replacement organs was able to bring some evidence of this favoritism for mental survival over biological survival. This study evinced that, when criteria had to help humans make hard decisions, those with more mental competence—not youthful vigor— were selected by society for survival. The logic beneath this is sound enough, because those of greater mental fitness are needed to host organs without any mental life in a complicated world. Similarly, a modern human mind is now needed to tend modern sheep in a domesticated world, even if this was not always so—before the taming of the natural world (Patzer, 2011).

However, the logic seems logical mainly because mental fitness is preferred for survival, not because mental fitness is required for survival. Just as animals were not always domesticated, living tissues did not always need cognition to survive their undomesticated environment. History, according to historians like Gilhus (2006), seems to plainly record a gradual transition from biologically (physiologically) directed systems to mentally (superstitiously) directed systems, in which living things ended up having to

trade away what little Life they had for (mentally regulated) permission to live that Life

(not unlike the historical plights of once feral species and newly civilized serfs).

In the wild, excess reliance on memory, excess reliance on preference, and the

psychological urgency to comply with or barter with mental *mands* riddled with

superstitious contingencies are not natural nor are they advantages (Sundberg, 2016). A

brain that is too demanding for its own body to sustain is not an advantage but a

hindrance (Holzman, 2014). The constant need to exploit biological substances to fuel the

non-biological mind, in view of this research and literature review, has resulted in a

single amensal mental species inadvertently hastening the global extinction of its

biological planet (Gibbons et al., 2000; Grandin & Johnson, 2005). While mental species

scorn biological species for preferring play, physical growth, and biological propagation,

the human species wastes a good deal of time and resources on work, cognitive growth,

and ideological propagation—while neglecting its transitory existence altogether (Frankl,

1990; Search, 1901; Vanderschuren, Achterberg, & Trezza, 2016).

The struggle for mental existence vs. physical existence. This research seems to

bear out the human struggle to exist more mentally than physically—to know its future

and to determine that future while missing the present. Like a law of diminishing justice,

however, mental preferences and the mental story's push to overextend its physical life so

that the mental story does not have to end, only seem to be practical when the biological

resource pool is larger than the psychological pool that uses those resources. Even so, it

requires an undervaluation of the physical resources (biology, ecology) to justify the

overvaluation of what exploits them (Hodson, MacInnis, et al., 2014). Eventually, this

unnatural regard, like biological amensalism, reaches a logical limit and the scale tips

back the other way (resulting in the need to hold as more precious than human life what was once a human commodity—to extend that treasured life).

In a system of natural selection, it is hypothesized by this researcher that what survives is the unpredictable combination of elective potentials invisibly guided by what might be termed *a struggle toward variety*. This unpredictability (the struggle for natural things to vary from predictions about them, including natural things like the weather) seems to safeguard living things from being overtaken by their own capacity to outguess one another (outsmart one another). This concept—the irony of prediction (the *paradox of intention* in psychology)—has a presence in the literature under climate prediction and *chaos theory* (Resler, 2016; Tschacher, Junghan, & Pfammatter, 2014). Yet although Darwin spoke mostly of natural selection (slight variations in previously observed phenomena), his insights were first inspired by what he observed people doing, not what animals were doing—a thing he called *unnatural selection* (because these decisions evidenced such species-centric, unnatural preferences). What Darwin (1876) saw was a biologically inconsiderate domestication (mastery) of the natural considerations all around it, like an internal struggle opposed to living systems, which variety it perceived as blind trial and error. Perhaps, however, variety is not random.

This research argues that the human species, unlike most natural species, competes mainly for mental status (to be remembered and to be revered), not to notice and revere Life while Life is briefly here. The stereotype content model by Fiske (2013) helps visualize this odd social exchange system wherein access to physical warmth (which is needed to survive) is granted if and only if the biological hosts of mental phenomena exhibit mental fitness. However, "mental" fitness is not a physiological need,

but simply the mental aspect charging its physiology to nourish and revere its mental phenomena by neglecting its physiological urges (similar to its disregard of surrounding environmental purposes). Compliance with mental contingency is followed by the odd "reward" of restoring access to the organism's basic needs which have been but do not need to be conditionally withheld (resulting in a sense of relief, often mistaken by the less memory-dependent creature for its erstwhile unconditional joy; Baynton, 2013; Fauth-Bühler et al., 2014).

The struggle for existence, to many civilized peoples, consists of the human ambition to conquer, dominate and otherwise outdo Nature—and then to (eerily) outlive Life and zealously retain what has been accumulated, rather than let the next generation or another species enjoy its share of Life (Moses & Stone, 2013). Ultimately, however, all living things must give back whatever they have acquired—never knowing what becomes of their mental aims, social reputation, and wealth (Ecclesiastes 1:1-18). This odd mental urgency, the literature explains, hates variety, and obsesses over repetition and self-similarity; it needs to know its enduring future is safe, yet pays no attention to the continual loss of its specious present (Chalmers, 2013). The social mind, born initially into an innocent body (lacking mental favoritism and the constant condemnation of the physical self), proceeds to subsume its physical body under a demanding, self-storied, mental authority, and subsequently competes for enduring status (after death) instead of enjoying the transitoriness of existence while Life is briefly here (Fiske, 2013; Frankl, 1990; Rochat, 2003). This *cognitive monarch* despises its physical self, worships mental phenomena, prefers things that never die to things that invariably die, and demands to know whatever natural safeguards safeguard the future of living things—which must not

be known if living things are to survive by varying from every predatory guess (Biernat & Danaher, 2013; Leyens et al., 2014). Still, each generation, Hope is born again, when humanity's biological infants remind humanity of its humanity—when the simple need for and wonder of one another (irrespective of physical or mental criteria) exceeds the concept of criteria (Adams & Brock, 2017; United Nations, 1948).

Practical implications. The practical implications include a possible shift toward honoring childhood, not exploiting it. They include an even greater emphasis on the application of Erikson's psychosocial concepts such as industry versus inferiority—but in favor of individuals, rather than industries of individuals. These practical implications appear in the following.

Honor childhood. This research has brought modest evidence that the epoch known as *childhood* is being lost to the expansion of human industry (under the concept of mental favoritism), as the demand for earlier and quicker mental development begins to exceed the rate of natural biological decay. Seniors are developing cognitive disorders at an alarming rate and thus being screened from receipt of life-saving organs. Yet, not long ago, lifelong mental development and a never withering intelligence were not needed so much as a deep respect for the withering human body (old age) and its lifelong survival of trial and error—often described in philosophy as the naïve yet unforgettable oscillation of *tristitia* and *laetitia* (sorrow and joy). Such sensory poignancy is needed to help guide the young and for cultures to pass down meaning in nonverbal ways (Christoforou et al., 2014; Haikonen, 2016; Meyer & Adrienne, 2013). Children are being denied play, compelled to study serious subjects at earlier ages, and curiously experiencing novel disorders such as ADHD, depression, autism, and learned

helplessness at the dawn of life (Panksepp, 2007). As evidenced in this study, physically

developing children may be denied the right to Life simply because their brains and

thought processes are not adequately developed, even if their bodies remain biologically

viable and in need of immediate (not promised) warmth (James 2:15-16). Like the human

view that fish do not feel pain (so the industry of fishing may flourish without regret), it

is possible that society does not think children feel pain when told to ignore their

childhood—so the industry of informational reverence may flourish without regret, while

the species of play goes extinct (Gray, 2013; Haikonen, 2016).

An application implied by this research is to permit play. If the stress of having to

achieve is collapsing the elderly, the middle-aged, and the young (biologically speaking),

perhaps the mental health industry may modify its focus toward caring for the biological

hosts of mental activity, not the overarching processes already collapsing that fragile

physiology. A hundred years ago, G. Stanley Hall (a psychologist) and Preston Willis

Search (an educator) noted how societally mandated demands for cognitive growth were

over-stressing the biological aspect of human children, leading to unusual physical and

mental responses such as myopia from staring at text instead of trees (an attentional

demand with unhappy side effects; Search, 1901). Perhaps now is the time to honor

childhood, not to study its value to industry. In Muir's words, perhaps childhood was and

is like being surrounded by giant sequoias—like waking up in a "solemn temple" (Curry

& Gordon, 2017, p. 258). If so, then now is the time to treasure childhood, while

childhood is briefly here. Marchant (1646) put it so poignantly—with the words "Fugit

infantia, fugit pueritia, fugit adolescentia, fugit juvenius, fugit senectus" (p. 129). These

words, translated, remind the reader that infancy flees, childhood flees, adolescence flees,

youth flees, and old age flees. By extension, if the taming of children steals their joy, and if the conquest of middle age by industry leads to seniors feeling abandoned in their golden years, perhaps the taming of any wildlife steals their inner majesty. If so, wistful adults of the human species might look at what is not yet domesticated about the planet and every natural species as children as well, and tell them that industry "hath had no power yet upon thy beauty. Thou art not conquer'd; beauty's ensign yet is crimson in thy lips and in thy cheeks, and death's pale flag is not advanced there" (Shakespeare, 5.3.93-96, as cited in Sugg, 2016). Perhaps childhood is a species, and perhaps civilization should not let that species go extinct. This can be a practical application, by practicing reverence for childhood and children rather than practicing reverence for the mental industrialization of children.

Honor people, not industries of people. Recent evidence and this research study suggest that the survival of industry is often prioritized over other concerns, as though the survival of human ideas were more crucial to humans than the survival of human beings (Flacco et al., 2015). This emphasis on industry and competition cannot fail to have an impact on living but impaired individuals struggling to find a niche in the social heart of their culture. These are individuals who crave warmth but need competence to reach it, and who dream of being admired but are more likely to endure scorn (Fiske, 2013). The literature is permeated with case studies and statistics of neglected children (too young), of overworked adults (just right), and of the abandoned elderly (too old), who end up unemployed, uninsured, and unloved—when they somehow failed to achieve industry, initiative, and generativity—though all of them were physically, desperately here.

This study studied some of these excluded individuals in the kidney allocation system, and how the failure to find value in the eyes of industry can result in more than just inferiority—it may result in premature death as well, from industrial neglect despite the technology available to save them. This study bore out that a human being could possess all the physical qualities needed for survival, and still perish because of the inability to follow complex mental regimen and thus end up being denied a replacement organ. The practical implications are that human beings should not have to worry about achieving industry if they can achieve compassion, nor worry about demonstrating competence if they can demonstrate mercy (Keys, 2014). Mercy for industries and their commodities is a kind of unnatural thing, in any case, when there are so many living things in need of mercy.

Future implications. The future implications lean toward the possibility that assessment does not make the need for mercy go away. Mercy may be more desirable than justice. These key future implications appear in the following.

***The absence of mercy does not abolish the need*.** In a paper exploring the psychological literature on silence, the authors argued that "the absence of something does not make it go away" (O'Grady & Meinecke, 2015, p. 6). As well, that paper (and this paper) made mention of an earlier dissertation by a prominent psychologist, who found that learned helplessness was a measurable physical injury, not an irrational mental injury that could be safely ignored (Seligman, 1967). Like an attachment urge, equivalent to Hachikō waiting faithfully at a train station for a caregiver who would never return, group helplessness seems to arise whenever marginalized groups wait faithfully for compassion that will never arrive (extending Seligman, 1967). In the title of his book,

Darwīsh poignantly called this need that would not go away, this howl at its moon or this cry at its civilization (for help that would remain unanswered), *The Presence of Absence* (Darwīsh & Antoon, 2012). He wrote of a desperate need for someone to hear your untold story, a story of being abandoned by a selective compassion granted to everyone else except your group.

This research study may help highlight the need for groups marginalized by a lack of mental fitness or physical youth to make their *absence* known—when it comes time for the allocation of group compassion. Those excluded by assessment of future value to industry seem to be "like a culture of discomfort that blossoms in the dark, or a city where things deferred in youth may grow up to be permanently ignored at maturity" (O'Grady & Meinecke, 2015, p. 6). Many are deferred in youth from a kidney, and many in old age are permanently ignored.

Honor life. This learner's study was looking for assessment bias. The study found much more, because it found an irony in trying to select the best candidates—it uncovered the irony of establishing invariant physical criteria, mental criteria, and fitness criteria to attempt to ethically allocate what every individual needs to have, regardless of criteria. Baruch de Spinoza called this demand for cognitive paradox an "absurdity," because if a substance is absolutely essential (a *sine qua non*) it can never be too scarce to be distributed equally:

> But if the second is asserted, namely, that the parts will not retain the nature of substance, then since the whole substance would be divided into equal parts, it would lose the nature of [its] substance, and would cease to be, which (by P7) is absurd. (de Spinoza & Curley, 1994, p. 93, The Ethics, Ethic I, Prop. 12)

What Spinoza was saying, was that nothing can be less than it essentially is (not apply to every element of that fundamental distinction); if every part is equal, to refer to a part is to refer to the whole. In this quote from *Ethic I: Of God*, de Spinoza was trying to explain that no part of the idea of God (the *Complete Idea*) can be of less essential value than every other part. No one can be less human, therefore no one can be more human, if even one (either one) approximates the complete idea of God.

Yet, the modern practice of placing faith in human industry and intellectual ingenuity (instead of God) seems to have replaced an erstwhile practice of placing simple faith in *every* part (in one another in every moment, instead of *the idea* of one another across time). These waiting lists of people hoping to be chosen were once part of a culture whose single hope was to be regarded well, not to be assessed well (Brook, 2016; Kiosses & Karathanos, 2013; Pedersen & Thomas, 2013). Still, this implication accords with a history of assessment which, ironically, screens out (neglects, disregards) the very people who came to Ellis Island because they believed in what it represented (Roberts, 2015). If criteria screen for only those persons criteria deem to be best qualified, criteria will reduce the pool to so indistinct a majority no individual will be distinct.

The practice of mercy for all life instead of justice for certain kinds of life seems it may help the human species reclaim its humanity, if only at the expense of an ironic *industry* of that humanity (Keys, 2014). If no child or stranger should wonder if he or she is too inferior to dream, this science may foster an industry of dreamers. People come to psychologists because they had nowhere else to turn, no one else who would let them pursue their dream of becoming a person (O'Donnell et al., 2017). A modest future implication of not being neglected by assessment, is perhaps that rather than a scarcity of

organs, there may be so many of the kind of person literature calls the *Heart of Man*, that amnesty for Life will become the new industry, and all persons of every trait no matter how common or rare, will enjoy the right to it (Mandikwaza, 2016).

Strengths and weaknesses. The main strength of this study was that it collected its representative sample from the only repository of that data, and found significance for several of its hypotheses. This included favor for mental fitness, despite an evidentially larger potential for significance in individuals with ESRD who did not even make the waiting list (due to even less mental fitness). This was very promising, since it was a decision that needed to be made before setting out on this research, and has allowed the above implications to be outlined with a degree of confidence.

A primary weakness of this study was that it could not infer causality. The data already existed, and the levels of the independent variables could not be experimentally controlled to prove the hypotheses under greater experimenter control. Further research might limit the study population to one transplantation center and attempt an experimental version.

Recommendations

The hope of any journey of discovery is that it will result in something beneficial to the community that made the journey possible. This section outlines some of the things this research uncovered along the way. It is hoped these may be of benefit to future researchers, and possibly find application in light of what this study found and did not find.

Recommendations for future research. This study can offer the following recommendations for future research. These include the exploration of unrepresented

groups, the paradox of trying to distribute human rights with less than enough resources, and the problem of trying to improve on natural justice with legal justice. These recommendations also highlight a strange human reverence for mental life (as though estranged from biological life), and an eerie irony underlying eugenic preference.

Unrepresented groups. This research study found it necessary to limit its investigation of assessment and potential bias to those individuals with end stage renal disease on the waiting list for a new kidney. However, far more die from ESRD than are even on that list, each and every year (Patzer, 2011). The first recommendation for future research is for researchers to ask who those individuals are—and why so few of them make the only extant list offering hope for continued survival, when all candidates are equally human. Future studies can test and see if this unrepresented group was excluded mainly because of physical bias, mental bias, or industrial bias—or perhaps, simply because, just as there is a paradoxical law governing the limits of justice, there is also a paradoxical limit governing the science of mercy.

The human rights paradox. A second recommendation of this research is to explore a human rights paradox (what it takes to be an individual with "equal rights"). Future studies may research represented versus unrepresented groups on the waiting list, to see whether the phenomenon known as a *heap* (of similar concepts or phenomena) is partially or wholly responsible for the eventual neglect of some traits and overemphasis on other traits. In the science of sortition and fairness this is often called *indivisible contested goods* (Burgers, 2016). The need for bias (evident in the difficult ethics of selection criteria struggling to avoid bias), greatly suggests a lasting paradox. Researchers might ask, when does an individual "begin," or where does an individual "end" so that a

"group of individuals" can begin. Similarly, does individuality refer to a heap of indivisible goods (indivisible because of a certain size of the heap) or does individuality refer to an element so indivisible it becomes incontestable (Henriksson, 2014; Holzman, 2014). These questions are asked because if what distinguishes individuals from one another is their *first significant difference* (briefly knowing), it seems plausible that a search for lasting individual differences (stable ergo recognizable) would be a paradoxical effort, since salient individual differences are the uncanny evasion of similarity (unstable ergo salient). In this dissertation, a struggle toward endless biological variety might be described as unstable ergo salient too, whereas a struggle for lasting ideals would oppose the survival of a biological system.

This paradox (element or heap) approximates an internal conflict—between perceiving either "one" lasting thing or many transitory things—and reaches back to a conundrum from ancient Greece which continues to puzzle theorists of categorization. The ancient Greeks were so puzzled by what constitutes a group of something (including people), they called it the *Sorites Paradox*, from the Greek word *soros* or heap (Trillas, 2017). The basic idea was to ask how many grains of salt it takes to make a heap of salt, or how many grains you can take away and still have a heap of salt. The fundamental question was, how many grains of something does it take to become an individual, or how many individuals does it take to become a group of individuals. The answer does not really seem to make sense, but it does seem to satisfice. A heap begins . . . not when a certain number is reached . . . but when it becomes easier to see a heap than the individual. This phenomenon seems prevalent in the heaping of individuals on lists to help rank their endless variety somehow. This expression of amazement regarding a

possible lack of redundant natural expression, was first made famous by Charles Darwin (1876). Yet, to date, naturalists continue to echo an awe from the past, with article titles such as *3,000 Species and No End – Species Richness and Community Pattern of Woodland Macrofungi in Mecklenburg-Western Pomerania, Germany* (Unterseher, Westphal, Amelang, & Jansen, 2012). During that time of great change in thinking, there was a startling realization that there was no end to the species (just endless variety). Even within what appeared to be just one variety, each leaf on the same branch of the same tree exhibited individual differences, in a diversely expressed struggle to survive. Darwin (1876) said it this way:

> Certainly no clear line of demarcation has as yet been drawn between species and sub-species . . . These differences blend into each other by an insensible series; and a series impresses the mind with the idea of an actual passage . . . from these remarks it will be seen that I look at the term species as one arbitrarily given, for the sake of convenience, to a set of individuals closely resembling each other . . . the term variety . . . is also applied arbitrarily, for convenience sake. (p. 31)

In the concept of represented versus unrepresented groups, there seems a paradox in not including all human groups in the concept of universal mental rights every human individual requires access to, in the struggle for physical survival.

    Legal justice vs. natural justice. The literature states that the concept of justice is that no group should bear the burden while another group reaps the benefit (U.S. Department of Health and Human Services, 2016). However, whenever the resources needed are less than those that need them, it becomes difficult to uphold this ideal, as

evidenced by the findings in this study. The number of persons that contribute to the

system of kidney transplantation greatly exceeds those the system can ethically reach.

This paradoxical relationship is called social justice. Since Aristotle, justice has

been divided into two kinds, natural justice and legal justice (Berry, 2016). Natural

justice struggles toward a mutual fairness and mutual benefit that applies to all creatures,

regardless of conditions. Legal justice is an intellectual (selective) version of natural

justice that tries to apply some form of natural justice when it meets a set of hidden

conditions, usually limited by a resource called the *social commons*—what everyone

needs to survive (Öztürk, Jongerden, & Hilton, 2014). In the case of the findings of this

study, the hidden conditions seem to be mental fitness and fitness for industry (which

honors human thoughts and works instead of human life and the biological commons

shared by all species; Isaiah 55:8-9). Future researchers might explore this concept since

it has such a prominent place in the literature.

> ***Reverence for mental life vs. reverence for life.*** A fourth recommendation of this

research, in keeping with the third recommendation, is to explore the obvious possibility

that civilization exhibits a greater reverence for mental things (mental bias) than for

living things (Jong et al., 2015; LaMothe, 2010). This study contributed modest evidence

of a societal struggle to extend the mental half of mostly biological creatures (the story

about the living creature), by grafting in the remains of other living things whose mental

life has apparently vanished. This researcher would compare this to a special time touring

the famous ship, the wooden U.S.S. Constitution in Boston harbor (nicknamed *Old

Ironsides*, and of War of 1812 fame). The researcher learned (with sadness) that it was

unlikely any of the original timbers or iron remained, even if its reputation remained

imperishable. Similarly, although the cells of the human body are replaced frequently, its mental story and reputation seem to out-survive them all. Perhaps then, the remembered affection for something that rescued humans in their past (whether the shape of their bodies, the arrangement of their faces, the features of their homelands, or some other physical reminder) becomes a preference for that symbol of departed phenomena—and the urgency to faithfully preserve a facsimile of that beloved biological vessel.

Conversely, however, human history evinces a clearly sacrificial view of its beloved vessels, in that humans have longitudinally sacrificed the living (though dearly beloved) to intangible mental phenomena (though clearly heartless) in hopes of garnering their imagined warmth and of influencing their favor (Gilhus, 2006). When all factors are equal, empirical evidence suggests that mental viability is significantly favored over physical viability—in the struggle for protracted existence. This estrangement from its biological ecology (mental reverence) seems confined mostly to groups of civilized humans that have come to view their natural surroundings (and biological underpinnings) as resources for the benefit of (or impediments to the sovereignty of) physiologically insatiable, ideological entities (LaMothe, 2010; Roberts, 2015; Wanderer, 2015).

The irony of eugenic preference. Thoroughness and fairness on the part of the researcher suggest the inclusion in this section of an open mind with respect to the logic of eugenically directed selection and allocation—asking which group should be logically eliminated to make most efficient use of a stable supply of scarce organs. This research should ask why human rights "matter" in terms of the survival of the species, and which change in assessment criteria would logically bring the need for organs versus availability of organs together given a relatively unchanging supply. This researcher estimates from

the practical implications of this study, that physically older and mentally impaired individuals of any age would be the logical choice to exclude from candidacy, and as the most efficient means of allocating scarce kidneys toward graft survival (Naesens et al., 2014). This also seems the solution favored by the industry of organ candidate assessment and allocation. Although the growing disparity between a stable supply of available organs and a growing elderly population would imply a strategy favoring an increased allocation to the fastest growing segment of the population, allocation policies in 2004 and 2014 suggest that, to solve the growing availability disparity, policies have changed their allocation strategy to increase allocation to the smallest segment—the young that remain mentally and developmentally unimpaired (Chopra & Sureshkumar, 2015; Rodrigue et al., 2013). The most physically young contribute most in terms of potential physical longevity, and the least mentally impaired contribute least to the potential burden of caring for an organ transplant.

However, the logic of eugenic preference possesses some ironies. The struggle to harvest something from one group or species for the sole benefit of another group or species engenders the inadvertent need to devaluate the group or species from which the benefit is derived—called commoditization in the literature—despite its escalating value to the sole benefactors (Hodson, Kteily, et al., 2014; Kendall, 2017). In addition, if this (symbiotically amensal) relationship must persist to its logical end, it must eventually deny the unfavored groups a kidney so that it can harvest their kidneys. The longitudinal result would approximate the self-cannibalism described by Montaigne, an ideal age distinction at which every other age would need to be sacrificed (consumed) to protract the numeracy and longevity of a species of "ideal age" (Zao, 2015). The issue of whether

human rights matter, or which groups ought to have these rights, accordingly, suggests that all creatures ought to be afforded the fundamental right to life, to avoid the uncanny eventuality in which a single human group or mental species must ultimately cannibalize the rest to preserve itself. Other researchers have illuminated that distinctions between species (e.g. between humans and non-human animals) also lead to the same distinctions between similar humans, after learning to believe in the differences (Costello, 2013).

Perhaps this sacrifice of so many physical candidates so that a few of the best mental candidates can survive, is correlated with an ancient history of reverence for human thought (Gilhus, 2006). If so, science might call this reverence for internal thoughts (instead of external Life) a kind of *cognitive idolatry*—and future researchers might test whether this assumption is significantly evident when society is faced with the survival of either a person or an ideal (Berns et al., 2012; Moser, 2002). This avenue is recommended because the most curious finding of this study was that donor organs (commodities at first) were being prioritized over human children and adults (who became commodities toward the survival of scarce human organs). The most intriguing discovery was that, as the proportion of candidates to organs widens, humans must inevitably screen out those without the mental ability to take care of an organ, even if the mind-body relationship is the opposite (organs keep the mind alive and it can never repay this service). The irony in revering psychological life instead of biological life is that what was once of least value (an organ) now becomes more precious than a large number of human candidates waiting for an organ, in the struggle to extend a few mental candidates beyond their natural end (Biernat & Danaher, 2013; Danovitch, 2014; Leyens et al., 2014).

Recommendations for future practice. The problem statement posed by this study, its set of hypotheses, and its analysis of the testing of those hypotheses, suggested at least two recommendations for future practitioners. The first was that requiring a social exchange of personal worth for group affection may not be in the best interests of future generations of social beings who will eventually not need affection. The second was that overemphasis on the mental phenomena of a physical species may be hindering physiological healing in favor of honoring ideological outcomes.

Grace for reverence: A reason for unconditional social warmth. The SCM model of social prejudice highlighted a sort of bargaining system, in which living individuals first need to demonstrate competence (cognitive belonging) if they hope to reach social warmth (affective belonging). Like asylum seekers, those who need comfort the most are unlikely to demonstrate they do not need society's help the most, making negative opinions against them more probable rather than less (Pedersen & Thomas, 2013). This seems inverted from theories of individual motivation, since if an individual is not urgent to reach social warmth (not in need of grace) there seems little incentive to hope to be of service to the social whole, nor to be enduringly grateful for the public services unconditionally granted to every individual. Yet this study found that those groups most in need of some affirmation of their worth to their society, (the once able aged who had contributed but now seem abandoned, and the unable young who had hoped to contribute anything at all) waited longer than those with very little need for social affirmation.

When faced with a difficult choice between someone of value to industry, or just someone who happens to be alive (regardless of future value), the group predicted to be

of most enduring value will not wait very long for help, while groups predicted as less valuable in the future (but in greatest need of immediate group regard) will probably perish while they wait for help to come (Darwīsh & Antoon, 2012). This finding suggests the industry of assessment may be inadvertently culling the gene and environment pools of those who look with deep reverence on their society—while favoring the pool of those who feel they are deserving of the help they receive (Danovitch, 2014; Goetz, Keltner, & Simon-Thomas, 2010). It may actually be more in the interests of the public good and help grow a deeper reverence and gratitude for the human community, if group reverence were enough to reach group grace, instead of individual intelligence to reach social warmth (Keys, 2014). By extending unexpected grace (esteem) to the undeserving, the medical and mental health communities might foster the survival of mercy and gratitude; this seems in contrast to rewarding those who already expect a reward, and thus who probably look on one another as competitors instead of neighbors, and the health community as a birthright (or a right that can be earned), instead of with enduring gratitude (Acts 22:28; Goetz et al., 2010; Matt. 6:2-4; Pedersen & Thomas, 2013).

  Biology-centered psychological therapy. The other key future implication of this research, suggests that psychologically focused practices are neglecting the biological organism whose hope is to reach social warmth, while the living creature struggles to fit its physiological needs into psychological categories (Fiske, 2013; Gilbert et al., 2012; Margulis et al., 2011). Practitioners might assess whether the biological aspect of their clients is ailing—not because of psychological imperfection—but because the broad substitution of psychosocial assessment for affirmation of worth has been neglecting a fundamental attachment need—in favor of the propagation of traits that unnaturally

affirm and foster attachment to human industry (Bretherton, 1992; Fischer-Mamblona, 2000; Livingstone, 2015). This research suggests that, although there does seem a social exchange of personal industry for social warmth—the failure of which foreshadows personal extinction—there is in each individual a very personal need for unconditional regard and inseverable attachment first (Bretherton, 1992). Perhaps this, above all, seems true (to be regarded well, regardless of fitness), rather than the unnatural requirement to achieve psychological regard before the physical individual is granted worth by the culture he or she cannot imagine living without (Gómez, Verdú, González-Megías, & Méndez, 2016; Muthiah, 2015). This recommendation stems from considerable work by researchers on the social behaviors of many species, and among humans as well (Bretherton, 1992; Fischer-Mamblona, 2000; Fiske, 2013). If individuals must learn not to need one another before they can reach one another, there will be little point in being able to reach what they no longer need.

Future practitioners may attempt a life-centered treatment of living things—a biology-centered therapy, in lieu of a brain-centered therapy—and assess whether brain fitness is more necessary for well-being (since initiative and industry come later), or whether mutual adoration and trust are more necessary (since trust is the very first step of faith between mother and child—not mental or physical fitness; Kivnick & Wells, 2014; Stone et al., 2013). Mothers do not ask anything of their children before they embrace them, because they are too grateful to hold them to expect anything else (Bretherton, 1992; Livingstone, 2015).

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Footnotes

[1]This study limited the sample to first-time recipients because some individuals received subsequent transplants as well, but were not included since that might confound the reason for their selection.

[2]The USRDS provides researchers with results in both adjusted and unadjusted form. When adjusted, the statistics are adjusted for age, sex, and race (U.S. Renal Data System, 2016).

[3]The data reported here have been supplied by the United States Renal Data System (USRDS). The interpretation and reporting of these data are the responsibility of the author(s) and in no way should be seen as an official policy or interpretation of the U.S. government.

Appendix A

IRB Approval Letters

GRAND CANYON
U N I V E R S I T Y

GCU D-50 IRB Approval to Conduct Research

(IRB Initiator Form)

Instructions: This form must be signed prior to initiating data collection.

Learner Information

Learner Last Name	Wenecke	Learner First Name	Lohny

GCU Email: lwenecke01@my.gcu.edu

Title of Dissertation Proposal: Neglected by Assessment: Industry versus Inferiority in the Competition for Scarce Kidneys

IRB Approval to Conduct Research

Protocol #: 1061932-1

Office of Academic Research: Dr. Cynthia Bainbridge

Signature: *Dr. Cynthia Bainbridge*

Date: June 2, 2017

Grand Canyon University - College of Doctoral Studies

GRAND CANYON
U N I V E R S I T Y™

3300 West Camelback Road, Phoenix Arizona 85017   602.639.7500   Toll Free 800.800.9776   www.gcu.edu

DATE: June 2, 2017

TO: Lonny Meinecke
FROM: Grand Canyon University Institutional Review Board

STUDY TITLE: [1091902-1] Neglected by Assessment: Industry versus Inferiority in the
                   Competition for Scarce Kidneys

IRB REFERENCE #:
SUBMISSION TYPE: New Project

ACTION: DETERMINATION OF EXEMPT STATUS
DECISION DATE: June 2, 2017

REVIEW CATEGORY: Exemption category # [45CFR 46.101(b)(4)-Existing data]

Thank you for your submission of New Project materials for this research study. Grand Canyon University Institutional Review Board has determined this project is EXEMPT FROM IRB REVIEW according to federal regulations. You may now proceed with data collection.

We will put a copy of this correspondence on file in our office.

If you have any questions, please contact Cathrine Ames at (602) 639-5460 or cathrine.ames@gcu.edu. Please include your study title and reference number in all correspondence with this office.

cc:

Appendix B

Informed Consent

No informed consent was required for this study. Data were collected from secondary sources.

Appendix C

Copy of Instrument

No instruments were required for this study. Data were collected from existing data in secondary sources.

Appendix D

Site Authorization Letters from Program Director and Project Manager

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service
National Institute of Health

National Institute of Diabetes and
Digestive and Kidney Diseases
Bethesda, Maryland 20892

6/1/2017

Dr. Meinecke,

This letter will confirm that NIDDK will entertain a request to supply standard analysis data from the USRDS for your proposal "Neglected by Assessment: Industry versus Inferiority in Competition for Scarce Kidneys." As you know the USRDS is committed to supporting research in kidney disease and administering data mergers to supplement clinical research.

Although I cannot promise approval, we have approved similar requests in the past few years as long as there is appropriate IRB oversight and patient confidentiality safeguards are in place.

Please contact me if you have additional questions.

Sincerely,

Kevin C. Abbott, MD, MPH
Program Director for
Kidney and Urology Epidemiology
National Institute of Diabetes and
Digestive and Kidney Diseases
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USRDS Data Request

Kurtz, Vivian <vikurtz@med.umich.edu>

Thu 3/9/2017 1:04 PM

Inbox

To: Meinecke, Lonny <lmeinecke01@my.gcu.edu>;

2 attachments (307 KB)

Meinecke request reference.pdf; RE - DE-IDENTIFICATION OF USRDS SSF(SAF).PDF;

Good afternoon,

Dr. Abbott forwarded your request to the coordinating center. We've reviewed the materials and can confirm that if you are requesting that we fill in the tables you attached with the data, then yes, we can do this as a DIM request. If you would like anything else beyond that, you will need to request the full SAFs.

Please let me know.

Thank you,

Vivian Kurtz, MPH
Project Manager
United States Renal Data System Coordinating Center (USRDS)
Kidney Epidemiology and Cost Center (KECC)
University of Michigan
Office: 734-763-1609
vikurtz@med.umich.edu

Electronic Mail is not secure, may not be read every day, and should not be used for urgent or sensitive issues.

From: USRDS Helpdesk <USRDShelpdesk@umich.edu>
Sent: Wednesday, March 8, 2017 10:50:00 AM
To: Meinecke, Lonny
Subject: USRDS Helpdesk Ticket 2423 Workspace 530

——————— When replying, type your text above this line ———————

Notification of Ticket Change

Ticket Number: 2423

Date: 03/08/2017 **Time:** 12:50:23
Creation Date: 03/07/2017 **Creation Time:** 13:20:34

Comment:
Entered on 03/08/2017 at 12:50:23 EST (GMT-0500) by Vivian Kurtz)
Good afternoon Mr. Meinecke,

If you are not using data from the Annual Data Reports, but asking for additional data, then you will need to get written approval from our NIDDK Project Officer, Dr. Kevin Abbott.

However, if you are using data from our Reference Tables, ADR, or any other information that you can find on our website, then you have permission, we just ask that you properly cite the information. For example, if using information from the 2016 ADR the suggested citation is:

United States Renal Data System. 2016 USRDS annual data report: Epidemiology of kidney disease in the United States. National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases, Bethesda, MD, 2016.

Please let me know if you have any other questions.

Thank you,
Vivian Kurtz
USRDS Project Manager

Entered on 03/07/2017 at 13:20:57 EST (GMT-0500) by lmeinecke01@my.gcu.edu:
Dear Sir/Mima,

I am a PhD student at Grand Canyon University (based in Phoenix Arizona). I am in the proposal phase of my dissertation in psychology, and my research method will be querying the USRDS for renal transplant data. I know that the data is in the public domain (unless requesting Standard Analysis Files). However, even though I will not need any patient specific data, our PhD program requires that learners obtain written approval for the research proposal submission process. May I request a simple written approval for me to query the data from the USRDS to fulfill this requirement? (An email from the USRDS stating this approval will probably be sufficient). Thank you sincerely in advance.

If it is helpful, my data request will be for data that may not be available in the Annual Data Reports, but is not patient specific. My data request will be made in writing per the USRDS information page at: https://www.usrds.org/request.aspx

Lonny Meinecke

Grand Canyon University (student ID: 20059634)

Appendix E

Formal Data Request to USRDS

USRDS

United States Renal Data System (USRDS)
Agreement for Release of Data

In this agreement, "Requestor Organization" means: Larry Douglas Matracia

Appendix F

Gaussian Raw Score Generator (GEN3.EXE)

```
////////////////////////////////////////////////////////////////////////////////////
// GEN3
// Generate a bunch of random numbers that are normally distributed (raw scores)
// from a set of summary statistics (mean, standard deviation, and N)
//
//   Use: This is handy when you only have anonymous summary statistics -- but no raw
//        data from participants
//   Reason: When all you have is the mean, std dev, and N, you can't do an ANOVA in SPSS
//   Goal: Generate pseudo raw data from the 3 summary statistics (normally distributed,
//         of course)
//
// From: https://stackoverflow.com/questions/2325472/generate-random-numbers-following-a
//       -normal-distribution-in-c-c
// Used: Visual Studio 2008 with TR1 addon for template classes and C++ 11 extensions
//       (or it won't compile)
// Compile: with /EHsc /W4 options added
////////////////////////////////////////////////////////////////////////////////////

#include <random>
#include <iostream>
#include <fstream>
#include <iomanip>
#include <string>
#include <cstdio>
#include <Windows.h>

using namespace std;

#define SAMPLE_SIZE    500
#define SAMPLE_SEED    1000
#define ACCEPTABILITY .05
#define MAX_ATTEMPTS 10

// These casts seem to help avoid compiler errors in VS 2008
typedef std::tr1::ranlux64_base_01 Myeng;
typedef std::tr1::normal_distribution<double> Mydist;

// Subroutines
void setColors(bool set);


int main()
{
        // Any seed should do (Spelt, Durum, EinKorn, Triticale...)
        int sampleSeed = SAMPLE_SEED;
        int sampleSize = SAMPLE_SIZE;                  // default size
        int sampleCounter = 0;                         // an index for our array of random
numbers
        double sampleMean, sampleSigma;                // numerical vars
        std::string strMean, strSigma, strSize;        // string vars
        double * sampleSave;                           // a place to preserve our random
sample
        // a flag so we know whether to keep trying or if all is okay (within 5%)
        bool isValid;
        double tmpSum, tmpMean, tmpSigma, tmpVariance;
        int numAttempts;
        double deltaMean, deltaSigma;
```

```cpp
        double pctMean, pctSigma;

        // old school green phosphor monitor (old habits die hard)
        setColors(true);

        // Ask the user 3 questions about the 3 summary statistics
        //  Example: 1. What is your name?
        //           2. What is your quest?
        //           3. What is the air speed velocity of an unladen swallow?

        // Question 1
        std::cout << "Please enter the mean: ";
        std::cin >> strMean;
        sampleMean = atof(strMean.c_str());

        // Question 2
        std::cout << "Please enter the standard deviation: ";
        std::cin >> strSigma;
        sampleSigma = atof(strSigma.c_str());

        //Question 3
        std::cout << "Please enter the sample size: ";
        std::cin >> strSize;
        sampleSize = atoi(strSize.c_str());

        // Here is the Box-Muller part
        // https://en.wikipedia.org/wiki/Box%E2%80%93Muller_transform

        // initialize the engine
        Myeng eng;

        // gotta seed the random number generator
        eng.seed(sampleSeed);

        // initialize the distribution
        Mydist dist(sampleMean, sampleSigma);

        // Discard any cached values
        dist.reset();

        numAttempts = 0;
        isValid = false;

        while (isValid == false && numAttempts++ < MAX_ATTEMPTS) {

                // Generate a bunch of valid values from a normal distribution
                // Fill an array of random numbers using the mean, std dev, and N just
                // input by the user

                // allocate space for our array
                sampleSave = new double[sampleSize];

                // reset our counter
                sampleCounter = 0;

                // loop until we're done
                for (int i = 0; i < sampleSize; i++) {

                        // fetch an imaginary raw score
                        double randomNumber = dist(eng);

                        // add it to our array for later
```

```
                sampleSave[sampleCounter++] = randomNumber;

                // let's have a look, shall we?
                std::cout << randomNumber << std::endl;

        }

        // Verify our random sample.
        // We need to do this because the resulting mean and std dev vary
        // too much from our targets with samples < 500

        // Step 1: calculate the mean from these random scores
        tmpSum = 0.0;
        for (int i = 0; i < sampleSize; i++) {
                tmpSum += sampleSave[i];
        }
        tmpMean = tmpSum / sampleSize;

        // Step 2: calculate the sum of differences from that mean (variance)
        // and get the sqroot of that (std dev)
        tmpSum = 0.0;
        for (int i = 0; i < sampleSize; i++) {
                double x, xsqrd;
                x = sampleSave[i]- tmpMean;
                xsqrd = x * x;
                tmpSum += xsqrd;
        }
        tmpVariance = tmpSum / sampleSize;
        tmpSigma = sqrt(tmpVariance);

        printf ("Target mean: %f\n", dist.mean());
        printf ("Sample mean: %f\n", tmpMean);
        printf ("Target stddev: %f\n", dist.sigma());
        printf ("Sample stddev: %f\n", tmpSigma);

        // Step 3: now see if our newly generated raw scores have
        // resulted in acceptably similar summary statistics...
        deltaMean = dist.mean() - tmpMean;
        deltaSigma = dist.sigma() - tmpSigma;
        pctMean = deltaMean / (double)dist.mean() * 100.0;
        pctSigma = deltaSigma / (double)dist.sigma() * 100.0;
        printf ("Sample mean is within: %.2f percent\n", pctMean);
        printf ("Sample stddev is within: %.2f percent\n", pctSigma);
        double acceptable = ACCEPTABILITY * 100.0;
        if (abs(pctMean) <= acceptable && abs(pctSigma) <= acceptable) {
                isValid = true;
        } else {
                delete [] sampleSave;
        }
} // end of while !not valid loop


// All okay? Let's write it out to a file...
// First, redirect output from the screen to a file to make this easier

// you must open me here, Darvich
std::ofstream out("out.txt");

// save old buf
std::streambuf *coutbuf = std::cout.rdbuf();

// then redirect cout from screen to file
```

```
        std::cout.rdbuf(out.rdbuf());

        // Label the list
        std::cout << sampleSize << " raw scores generated below" << endl;
        std::cout << "old   mean: " << fixed << setw(6) << setprecision(2) << dist.mean()
<< endl;
        std::cout << "new mean: " << fixed << setw(6) << setprecision(2) << tmpMean <<
endl;
        std::cout << "old   stddev: " << fixed << setw(6) << setprecision(2) <<
dist.sigma() << endl;
        std::cout << "new stddev: " << fixed << setw(6) << setprecision(2) << tmpSigma <<
endl;
        std::cout << "Sample mean is within: " << fixed << setw(6) << setprecision(2) <<
pctMean << endl;;
        std::cout << "Sample sigma is within: " << fixed << setw(6) << setprecision(2) <<
pctSigma << endl;;
        std::cout << "============================================" << std::endl;

        // Write out our array of normally distributed pseudo-raw data to our file
        sampleCounter = 0;

        // reset our counter please
        for (int i = 0; i < sampleSize; i++) {
                std::cout << sampleSave[sampleCounter++] << std::endl;
        }

        // Be nice... reset everything to standard output again
        std::cout.rdbuf(coutbuf);

        // Output some basic info to the screen so user knows what happened (old code)
        // printf("\n");
        // cout << "mean: " << fixed << setw(11) << setprecision(10) << dist.mean() <<
endl;
        // cout << "std dev: " << fixed << setw(11) << setprecision(10) << dist.sigma() <<
endl;
        // cout << "sample size: " << sampleSize << endl;

        // Flush input buffer and wait for a key
        fflush(stdin);
        printf ("Number of attempts: %d (max attempts: %d)\n", numAttempts,
(int)MAX_ATTEMPTS);
        std::cout << "Press enter to exit...\n";
        std::getchar();

        // Assuming this is valid, free the memory
        if (isValid == true) {
                delete [] sampleSave;
        }

        // done, no rtn value
        setColors(false);
        return (0);
 }
// All done

//////////////////////////////////////////////////////////////////////
// setColors
// Subroutine to approximate the good old days of green phosphor monitors
// Args: just set them or unset them (returns nothing)
//////////////////////////////////////////////////////////////////////
void setColors(bool set) {
        static HANDLE hConsole = GetStdHandle(STD_OUTPUT_HANDLE);
```

```
        static CONSOLE_SCREEN_BUFFER_INFO consoleInfo;
        static WORD saved_attributes;

        if (set == true) {
                /* Save current attributes */
                GetConsoleScreenBufferInfo(hConsole, &consoleInfo);
                saved_attributes = consoleInfo.wAttributes;

                SetConsoleTextAttribute(hConsole, FOREGROUND_GREEN |
FOREGROUND_INTENSITY);
        } else {
                /* Restore original attributes */
                SetConsoleTextAttribute(hConsole, saved_attributes);
        }
}
```

Appendix G

Research Model

Physical Age

	Just Right	Too Young	Too Old
Just Right	(A)	(B)	(C)
Somewhat Slow	(D)	(E)	(F)
Too Slow	(G)	(H)	(I)

Mental Age

Figure 5. Research model showing cell layout for research concepts and variables.

Appendix H

Intellectual Stereotype Model (ISM)
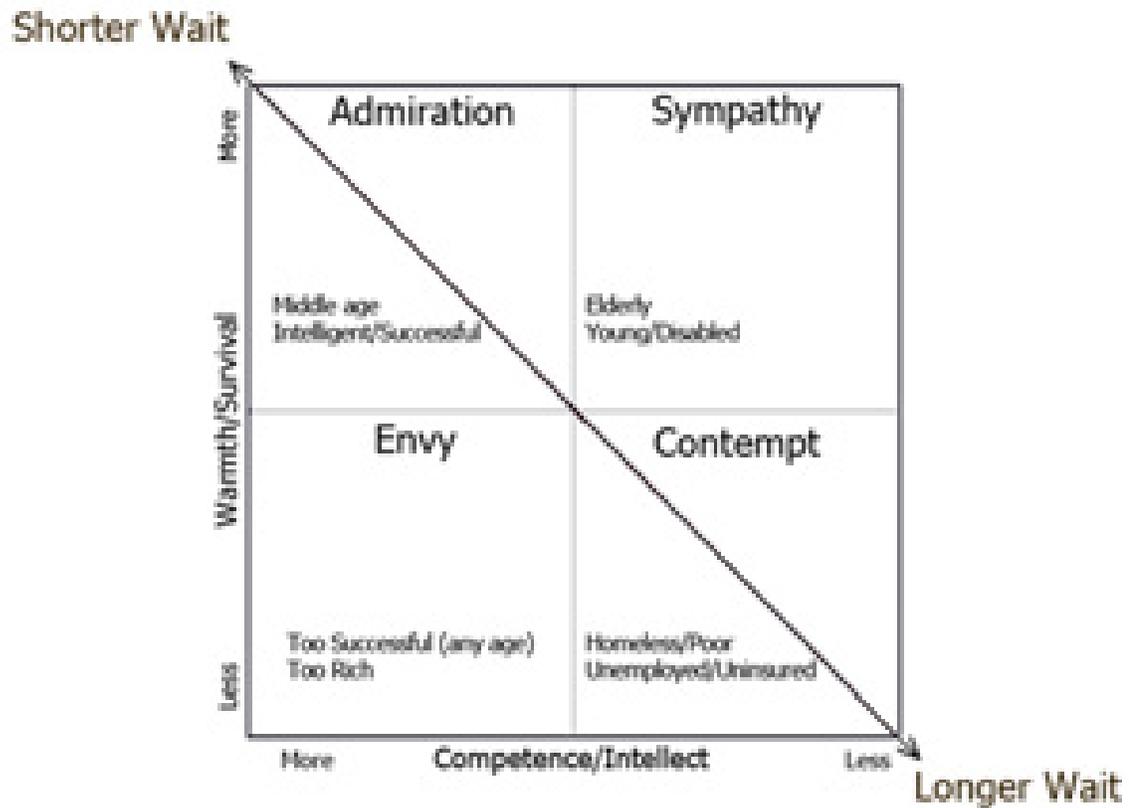
Figure 6. Intellectual stereotype model (ISM). In the original stereotype content model (SCM), social perceptions are mixtures of competence and warmth. In the intellectual stereotype model, personal competence and intellectual capacity are needed to trade for social warmth and physical survival (a social perception that affection must be earned). This is based on Erikson's psychosocial stages and Marcia's psychological identity model (an extension of Erikson's work).

Appendix I

**Figures and Charts from Statistical Analysis**
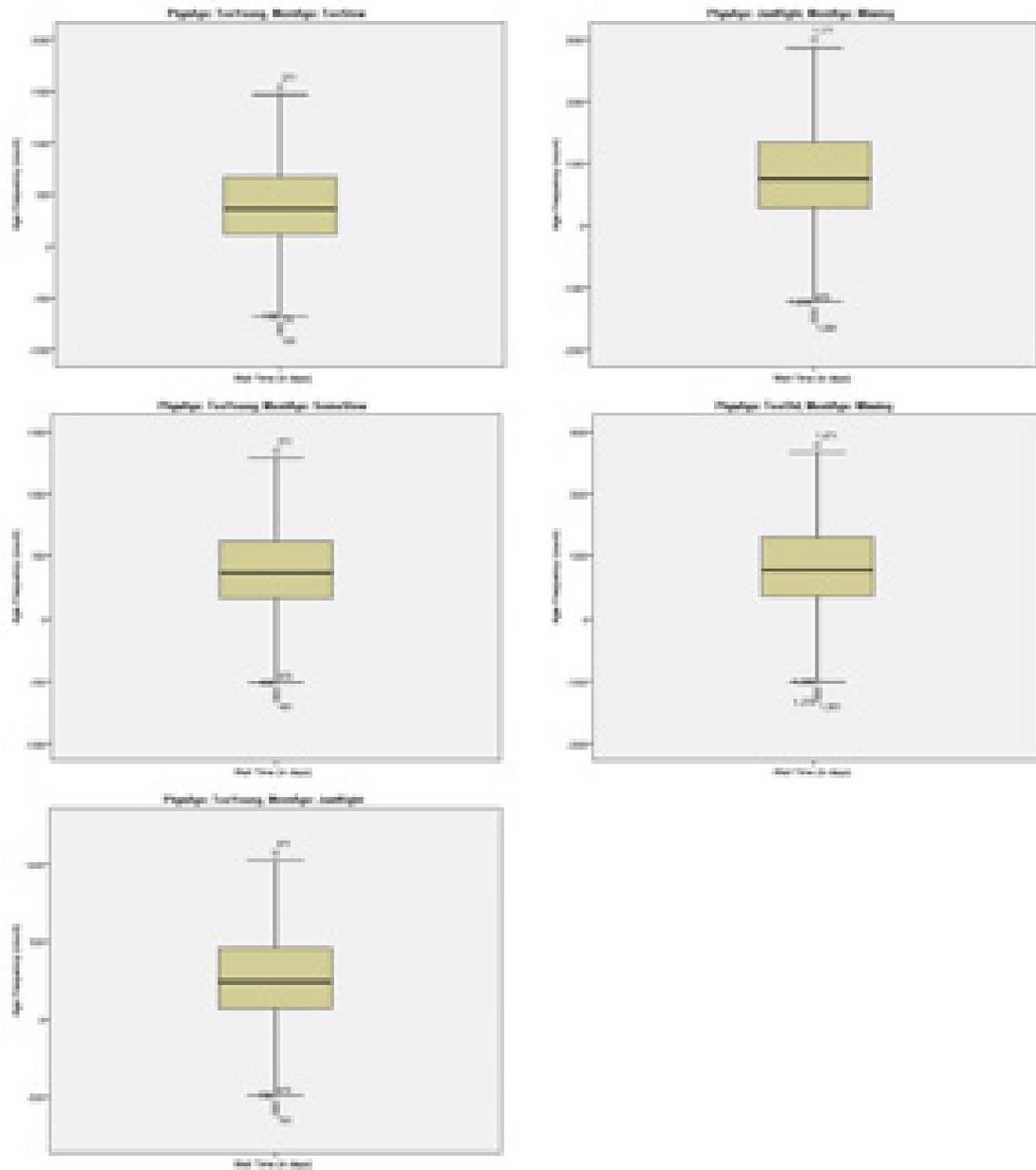
*Figure 7*. Box plots showing no significant outliers.
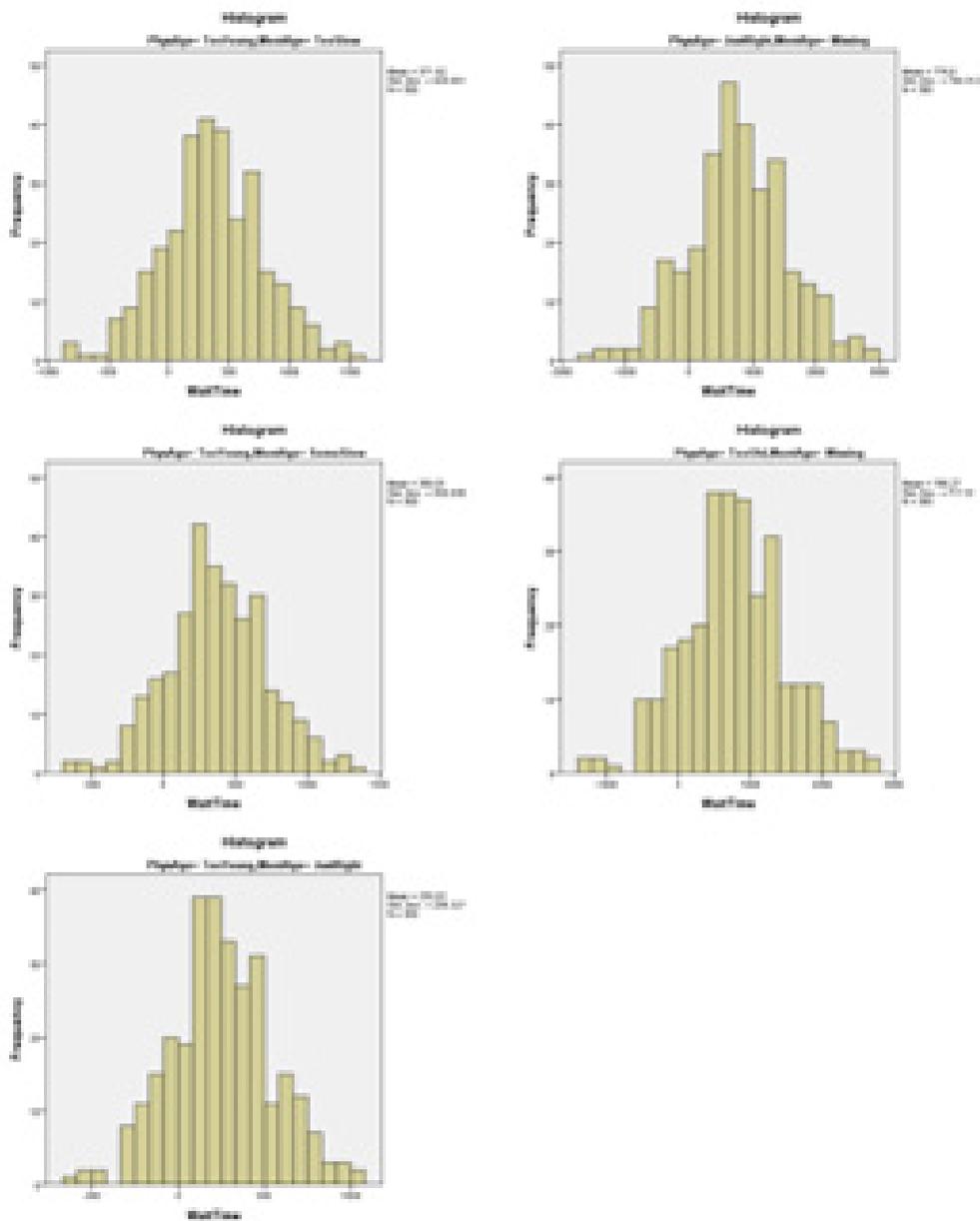
Figure 8. Histograms showing normality of distribution.
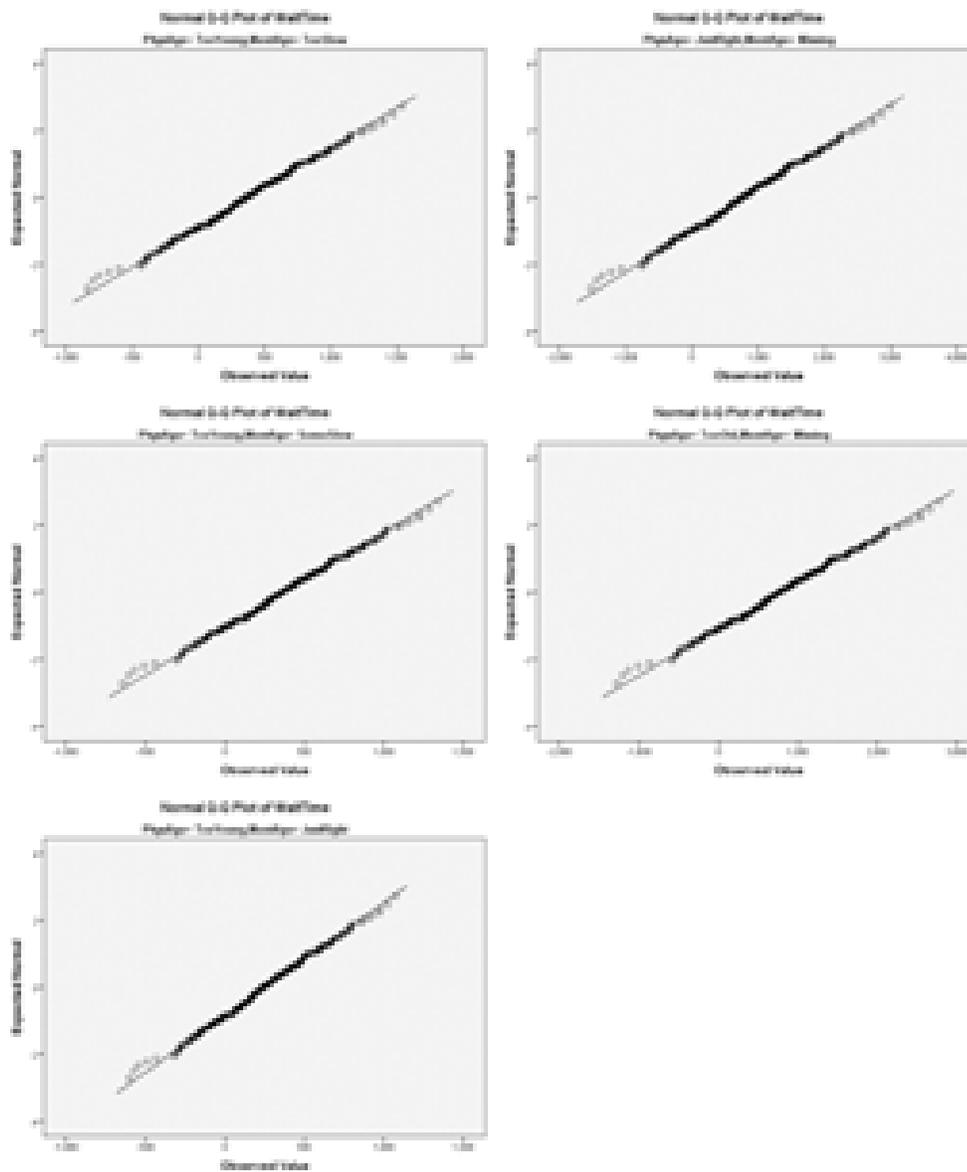
Figure 9. Q-Q plots showing normality of distribution.