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Child care stability affects child and family outcomes. Stability reflects the time dimension of a child care arrangement. Although stability does not guarantee positive outcomes, instability appears to decrease the likelihood of achieving them. Some level of stability is a necessary, although not sufficient, characteristic of care that meets children's needs. Child care stability is of special concern for children in low income families because child care impacts are greatest for these children, and current welfare policies result in more low-income children in nonparental care.

This study increases understanding of child care stability through (a) an analysis of findings from stability studies over 30 years, (b) an examination of relationships of the four major stability measures, and (c) presentation of results from an analysis of the stability of subsidized child care arrangements in Oregon.

The analysis of stability studies documented lack of consistency in conceptualization, measures, and methodology. These inconsistencies limit comparisons of reported stability findings and confidence in estimates of child care

stability that have been reported.

Examination of the four stability measures found that the three child-level measures appear to describe the same construct as they are highly correlated. The fourth stability measure is at the level of the arrangement and captures a distinctly different aspect of stability.

Stability levels of subsidized arrangements in Oregon appear lower than those found in nationally representative samples but similar to levels found in populations participating in public assistance programs. About a third of children had very stable care but others had high levels of instability. Fifty percent of arrangement spells ended by 3 months, even when children were observed for 36 months.

The study concludes with recommendations for future research.

Measurement of Child Care Arrangement Stability: A Review and Case Study Using Oregon Child Care Subsidy Data

by

Roberta B. Weber

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I understand that my dissertation will become part of the permanent collection of Oregon State University libraries. My signature below authorizes release of my dissertation to any reader upon request.

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Roberta B. Weber, Author

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Chapter 1

Introduction

Stability connotes strength and ability to endure. When applied to child care, people intuitively sense that stable child care is better for children than its alternative and research supports this belief. For over 30 years, researchers have studied child care stability as a predictor of other outcomes, or as the outcome of interest. Researchers have attempted to determine if child care stability predicts child and family outcomes or to measure child care stability and the factors associated with it. Although researchers have documented child care stability effects, our understanding of the phenomenon itself, and of its impacts, remains limited. We lack consensus on what child care stability is, or how to measure it. These differences result in mixed findings about the amount of stability children experience. Weaknesses in some measures undoubtedly limit our ability to assess its effects, and differences in conceptualizations, definitions, and measures confound our ability to compare findings of how stable children's care experience is.

This study aims to increase understanding of child care stability through (a) an analysis of findings from stability studies over 30 years, (b) an examination of relationships of the four major stability measures, and (c) presentation of results from an analysis of the stability of subsidized child care arrangements in Oregon. I explore measurement and meaning of child care stability by using multiple measures on the same data set, four years of data on families participating in the Oregon child care

subsidy program.

This study meets three research needs. First, we lack a description of the stability research carried out over the last 30 years, and hence don't know what levels of stability have been found. Second, researchers use different conceptualizations and measures of stability and we don't know the extent to which stability measures describe the same construct, thus limiting comparison of findings and ability to measure stability effects on child and family outcomes. Finally, the United States is making a significant investment in child care for low-income children and little is known about the care being purchased. Understanding the stability of the child care arrangements public funds support for children from low-income families is important to assessing the impact of this investment.

Specific research questions follow:

1. What is known about child care arrangement stability?
2. To what extent do the four child care stability measures that have emerged in the literature describe the same phenomenon?
3. How stable are the subsidized child care arrangements of preschool children in female-headed households in Oregon?

Communication about child care stability requires careful use of language. Throughout this paper, the term caregiver refers to an individual, provider refers to a facility such as a center or the home of a related or nonrelated caregiver, and child care arrangement refers to the combination of an individual child and an individual provider. Ninety-five percent of the providers in this data set are home-based providers (relatives, family child care providers, and in-home providers) and 83% of

arrangements (an individual child and an individual provider) take place in a home. There are more arrangements than providers because both providers and children can be involved in multiple arrangements; a provider can care for multiple children and children can have multiple providers.

In home-based child care, there typically is only one caregiver so the provider and the caregiver are synonymous. In cases in which a center is the provider, caregiver is not synonymous with provider as centers include multiple caregivers. Appendix A contains a glossary with definitions of these and other terms used throughout this study.

Child Care and Low-Income Families

Child care stability is of special concern for children in low-income families because child care impacts are greater for these children (Caughy, DiPietro, & Strobino, 1994; National Research Council and Institute of Medicine, 2000) and government policy encourages parental employment and hence , increased use of nonparental care. Since 1988 and the passage of the Family Support Act, government policies have increased pressure on heads of low-income families, either current or potential welfare participants, to become employed.

Parental employment policies have been accompanied by major investments in child care for welfare recipients and other low-income working families. The federal Child Care and Development Fund, the major source of child care funding, are sent to states, territories, and tribes. Most child care policies are set at the state level and most funds are spent through vouchers to providers the parents have selected. Since 1990 federal and state funding for child care subsidies has increased from an estimated $2

billion to over four times that amount (Adams, Snyder, & Sandfort, 2002). An estimated 1.9 million children in the United States (Adams et al.), including approximately 25,000 in Oregon (Oregon Child Care Division, personal communication, October 31, 2003), participate in subsidized child care each month. Little is known of the quality of these publicly subsidized child care arrangements. Measuring stability, a correlate of quality, of subsidized arrangements will increase understanding of the effectiveness of the public investment in child care.

Effects of Child Care Stability on Children

Stability in child care arrangements is a necessary, although not sufficient, characteristic of care that meets children's developmental needs. Children can create attached relationships with caregivers that, although differing from attachment to mothers (Hamilton & Howes, 1992), do affect developmental outcomes (Howes & Hamilton, 1992a; Howes & Matheson, 1992b; Pianta, 1992; Van IJzendoorn et al., 1992). The stability of the child-caregiver relationship is positively and significantly related to more positive infant caregiving behaviors (Rubenstein & Pedersen, 1977) and security of attachment (Barnas & Cummings, 1994; Cummings, 1980; Raikes, 1993). The attachment level of the child-caregiver relationship is independent of the level of mother/child attachment (Howes & Oldham, 2001). Attachment with both mother and caregiver best supports development.

Child care stability affects developmental outcomes and these effects appear to be long-term. The number of arrangements in the early years appears to be related to social competence at 54 months (NICHD Early Child Care Research Network, 2003), and has a strong and consistent positive impact on child outcomes (Loeb, Fuller.

Kagan, & Carrol, 2004). Children who experience unstable child care tend to have more behavioral problems than do those with more stable child care (Huston, Chang, & Gennetian, 2002). With family characteristics held constant, stability of child care in the preschool years predicts better school adjustment in first grade (Howes, 1988). The number of nonmaternal arrangements affects the social behavior of third- and fourth-grade children by mediating the negative effects of maternal employment on behavior (Youngblade, 2003). The child-caregiver relationship is central to child care outcomes and stability appears to be key to this relationship.

Effects of Child Care Stability on Parents and Families

Child care stability affects outcomes for the family as well as the child. Child care stability is associated with maternal employment (Blau & Robbins, 1991a, 1991b, 1998; Floge, 1985; Hofferth & Collins, 2000, Miller, 2003), although the nature of the relationship is not clear. Researchers are not certain of the extent to which child care instability drives employment instability, and the extent to which employment instability drives child care instability. Child care stability is also associated with family well-being (Lowe & Weisner, 2004; Scott, Hurst, & London, 2003). Child care stability is important to the well-being of children, mothers, and whole families, yet little is known about the level of stability children experience.

Theoretical Perspective

Child care stability can best be understood in relationship to other parts of the child's environment, such as the family and parental employment. Ecological theory provides a framework for viewing the factors that affect child care stability. Urie Bronfenbrenner's ecological theory of development supports the study of naturally

occurring phenomena and the focus on interactions among theoretically and empirically relevant variables. In addition, Bronfenbrenner's (1994) proposition of a child's requirement for reciprocal relations with attached adults provides a theoretical basis for the importance of child care stability.

Bronfenbrenner (1977, 1986) conceptualizes three environmental structures as interdependent and nested, each contained within the next. At the innermost level are those settings in which the developing person lives and grows, such as the family household and the child care facility; Bronfenbrenner calls these microsystems. More than two thirds of young children spend significant periods of their preschool years in nonparental care arrangements (Tout, Zaslow, Papillo, & Vandivere., 2001). Thus, nonparental care is an important microsystem. Child care and home have become the primary microsystems in which most preschool-age children develop. What happens in one setting impacts the other. Parental and household characteristics affect stability and other aspects of care. Stability of care affects the child's development and other aspects of family well-being. Bronfenbrenner calls the system of interacting microsystems the mesosystem.

Exosystems are social realities that impact the immediate systems in which the person lives. However, typically the developing child is not present in these exosystems. For example, relevant exosystems for children include mother's employment, schooling, or job training as well as participation in the Temporary Assistance to Needy Families (TANF) or child care subsidy programs. I use only mother because this study is limited to children in female-headed households. These affect both home life and child care experiences. The availability and affordability of

the community's child care supply affects all-income families with young children. These exosystem elements shape the child's routines and the resources available to the family.

The final system, the macrosystem, does not refer to specific settings or contexts. Rather, the macrosystem is made up of larger realities such as ideologies, policies, or widely-held beliefs that shape and permeate the immediate settings. Child care subsidy and TANF policies send impacts throughout micro-, exo-, and macrosystems. These policies shape the world of low-income families.

Ecological theory provides a model for observing relationships among environments that affect development. By recognizing interdependence within systems it provides a framework for studying interactions among system elements. What happens in one setting influences other settings. Figure 1 graphically represents the ecology of child care and sets the framework for this study.

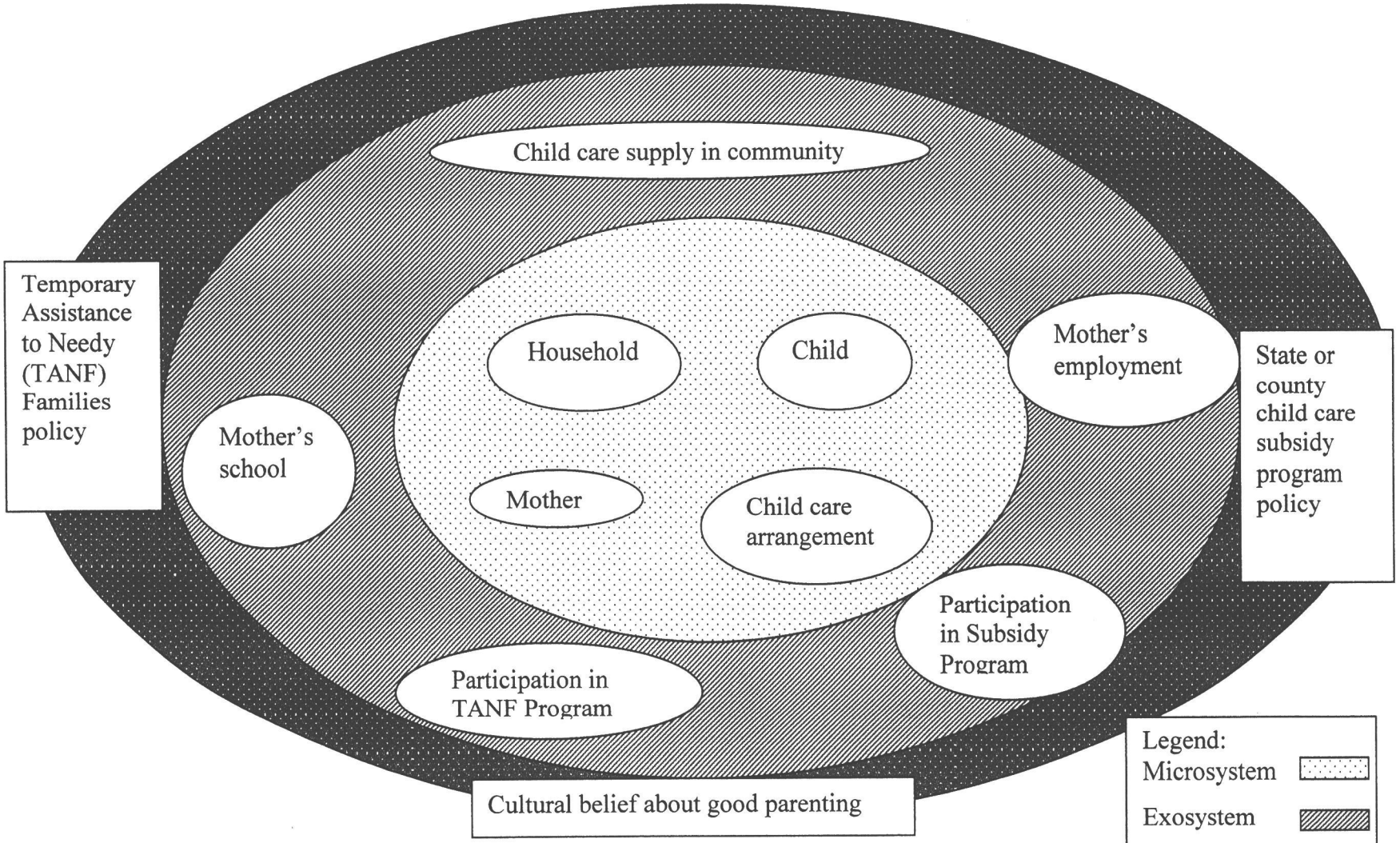

Figure 1. An Ecological View of Child Care

Chapter 2

Literature Review

Although many researchers find stability an important characteristic of child care arrangements, they differ on why it is important, what it is, what to measure, and how to measure it. Understanding these differences is central to understanding findings from studies of child care stability.

Why Researchers Study Child Care Stability

Researchers study child care stability for two primary reasons: either to understand how child care stability affects child or family outcomes, or to assess the stability of child care arrangements and the factors that affect arrangement stability. The first group studies the effects of child care stability on developmental outcomes (DeSchipper, Tavecchio, Van Ijzendoorn & Van Zeujl, 2004, Loeb et al., 2004; NICHD Early Child Care Research Network, 1997, 1999, 2001, 2003; Raikes, 1993, Youngblade, 2003), maternal employment (Blau & Robins, 1991a, 1991b, 1998; Hofferth & Collins, 2000; Miller, 2003), and child and family well-being (Emlen, Koren, Schultze, 2000; Lowe, Weisner, & Geis, 2004; Scott et al., 2003).

In the second group of studies, researchers examine child care stability in order to better understand child care dynamics. These researchers examine how long child care arrangements last or how many changes in providers children experience (Emlen, Donoghue, & Clarkson, 1972; Hofferth, Brayfield, Deich, & Holcomb, 1991; Meyers, 1997; Moss & Brannen, 1987; Singer, Fosburg, Goodson, & Smith., 1980; Wolf & Sonenstein, 1991). Most research in this second group focuses on how mother's employment and other factors affect child care arrangement stability.

What Child Care Stability Is

Most simply, stability describes the time dimension of the child's relationship with a child care provider. Precisely conceptualizing child care stability, however, is challenging. No consensus on the definition has emerged. The absence of definitional agreement is due, at least in part, to the complexity of the phenomenon in terms of what it is and how it affects a child.

Change Versus Stability

Lowe et al., (2003) argue that the level of predictability of change is key to defining stability. Based on their in-depth engagement with families, they differentiate between predictable changes (connected with school year changes or child maturation) and instability (connected with sudden loss of income or decision of provider to no longer care for the child). Marina, a mother who participated in Lowe & Weisner's (2004, 22) ethnographic study of welfare families' child care, put child care stability in context. "Stability' meant providing a good home and having the same group of people as a support network for her children. She believed her children needed 'a circle of people who will always be there for them." From this perspective, stable child care arrangements and constancy in care routines are essential components of a supportive network.

In their definition, Emlen and colleagues (1972, 4) capture the elusiveness that confounds researchers who attempt to study child care stability.

> . . . we define stability of the arrangement as a quality of robustness, of being well-made, held together by internal social bonds, and capable of permanence. It is important to note that stability is not equated with one of its empirical indicators, that of duration, but rather is defined in terms of having the

> capability of lasting a long time or at least not breaking up before it has served its purpose.

Purposes vary, and, in turn, the ideal length of a child care arrangement will vary.

Researchers vary in what they treat as a child care arrangement. Some, such as the NICHD Early Child Care Research Network (1997, 1999, 2001, 2003), define any type of nonmaternal arrangement as child care, including paternal care. Others define child care as nonparental arrangements.

Threshold Level and Age

The length of child care arrangements or number of different providers children experience are important, but may not capture what stability means for a child. Longer arrangements or fewer arrangements are not always better. Some changes improve child or family life, such as instances in which an arrangement is not safe or does not match the parent's standards and values. Sometimes parents, especially first-time users of child care, make multiple short arrangements as they learn how to use child care. Parents sometimes report their child outgrowing a current arrangement. In other instances, a sibling is born and the parent moves the child to an arrangement that includes the baby. Other changes are linked to yearly rhythms such as the beginning of summer. It is likely that the above changes benefit the child. Other changes threaten a child's well-being. The child's age will affect how many relationships are supportive. We lack an empirical basis for determining how much of what type of change threatens development at various ages.

Use of Multiple Arrangements

Nothing more seriously confounds the definition of stability than does family use of multiple arrangements, that is, the simultaneous use of more than one arrangement. Because the number of caregivers and arrangements is greater when using multiple arrangements, children may experience less continuous or attached relationships with their caregiver. On the other hand, it may be that families maintain a stable relationship with one provider while, at the same time, creating patchworks of arrangements that balance child and family scheduling demands. A review of what is known about the use of multiple arrangements informs this discussion.

We know that many families use more than one arrangement at the same time (Blau & Robins, 1998; Crockenberg & Litman, 1991; Floge, 1985; Folk & Yi, 1994; Moss & Brannen, 1987; Presser, 2003; Scott et al., 2003). Researchers in three studies using nationally representative samples report varying levels of the use of multiple arrangements. Using National Household Education Survey data, Hofferth, Shauman, and Henke (1998) found that 12% of all preschool age children experienced two or more arrangements whereas the Census Bureau (Smith, 2002) found 19% of preschoolers (7% with nonemployed mothers and 30% with employed mothers) had two or more arrangements. Using wave 1 of the National Survey of Households and Families, Presser found 41% of all employed mothers of preschoolers used multiple arrangements, but over half of these were parental arrangements. Only 22.3% of employed mothers used two or more nonparental arrangements. Use of multiple arrangements varied by marital status and work shift. Single mothers were less likely to use multiple arrangements, but when they did they were more likely to use

nonparental arrangements. Mothers working a nonday shift or weekends were substantially more likely to use multiple arrangements, 51.7% to 33.2% respectively. The story remained the same when only nonparental arrangements were included, 25.7% to 19.7%.

In a study of British children under 18 months of age, Moss and Brannen (1987) found 20% of children with a mother employed full time had more than 1 arrangement. In a study of very low-income families, Miller (2003) found that in any given month, 20% of families had multiple arrangements, and that over two years, 37% of families used multiple concurrent arrangements. Despite these varying estimates, it is clear that use of multiple arrangements varies by age of child , employment status of mothers, marital status, work shift, and possibly by household income. Most importantly, use of multiple concurrent arrangements is common enough that such arrangements need to be considered in child care stability studies.

The use of multiple arrangements appears purposeful. Sometimes parents are putting together what they see as the best environment for the child, which often means combining different forms of relative care with some hours in a center (Folk & Yi, 1994; Hofferth et al., 1991). Hofferth and Collins (1998) find that center is one of the types of care in almost two thirds of the cases of multiple arrangements for preschoolers; a result supported by Floge's (1985) finding that use of multiple arrangements increases as does use of group care as children age. Many parents manage the moves of preschool-age children into centers by combining arrangements. Parents and other relatives make up the bulk of these supplementary arrangements (Hofferth et al., 1991). Folk & Yi (1994) find that 57% of multiple care combinations

include fathers and 37% include other relatives.

Parents who work nonstandard or rotating hours may have no choice but to patch together arrangements (Blau & Robins, 1998; Folk & Yi, 1994; Han, 2004, Lowe et al., 2003; Presser, 2003, Scott et al., 2003). The use of multiple arrangements may be key to employment stability for some mothers. For example, Floge (1985) found that use of multiple arrangements is the only "type" of child care consistently related to a greater than average continuation of employment or schooling. Hofferth and Collins (2000) found that mothers who use multiple arrangements were slightly, but not significantly, less likely to leave their job. Floge (1985) found that among those who paid for care, mothers that used multiple arrangements paid more, on average, than did those who used only one arrangement. Folk & Yi (1994) found the budget constraints did not appear associated with use of multiple arrangements. Cost saving does not seem to be the explanation for use of multiple arrangements.

In a small study of the effects of maternal employment on child behavior, Crockenberg and Litman (1991) found concurrent multiple arrangements were positively associated with higher levels of defiance of two-year-old boys of employed mothers when other family and child care factors were controlled. However, more study is needed to assess whether and under what conditions multiple concurrent arrangements positively or negatively affect child outcomes.

Parental and Close Relative Care

When the father or other relative provides care, the child is not in a new relationship and continuity of the child's relationship with the caregiver is probably not an issue. Similarly, when a change represents a move from nonparental to parental

care, the impact on the child probably differs from a change from one to another nonparental provider. If the child leaves and then returns to the same nonparental arrangement the impact would not be the same as if the child were moving into an arrangement with a caregiver who the child does not already know. In all of these instances, the adult-child relationship can be thought of as ongoing or stable..

Measurement of Child Care Stability

Given differences in reasons for measuring stability, in conceptualization of it, and complexity inherent in it, the absence of consensus on what to measure is not surprising. Context determines whether or not change represents instability. In addition to the contextual dimension, stability is inherently comparative; more or less than some standard. Researchers interested in child outcomes are challenged to create measures that capture child care stability. Ideally, measures will differentiate predictable change from instability and will account for multiple arrangements. One measure or type of measure may not be sufficient to describe the phenomenon. As in the classic story of the blind men describing the elephant, each stability measure may capture a real component that, by itself, fails to adequately describe the phenomenon.

Despite the challenges, researchers have attempted to measure child care stability. Two distinct types of quantitative child care stability measures have emerged: (a) caregiver stability measures and (b) arrangement stability measures. Caregiver measures (Barnas & Cummings, 1994; Cummings, 1980; DeSchipper et al., 2004; Hamilton & Howes, 1992; Howes, 1988, Howes & Hamilton, 1992a, 1992b, 1993; Howes & Oldham, 2001; Howes & Olenick, 1986; Raikes, 1993) have been designed to capture continuity and change within child care facilities with multiple

caregivers. Arrangement or provider measures capture continuity and change across providers. The remainder of this paper deals with quantitative measures of child care arrangement stability.

Stability of Child Care Arrangements

Four major measures of arrangement stability have emerged over the last 30 years: (a) number of providers, (b) transition, reported as the percentage who remain with the same provider or the percentage who changed providers, (c) prime primary provider ratio, and (d) duration of arrangements. The table in Appendix B provides a brief description of child care arrangement stability studies, indicating which studies employed which measures.

With the first measure, researchers simply count the number of providers in a given time period (Loeb et al., 2004; NICDH Early Child Care Research Network, 1997, 1999, 2001, 2003; Youngblade, 2003). Researchers using the second measure determine if a child remains in the same arrangement for each observed time period. Some researchers report findings as the percentage of children who remain with the same provider over time (Blau & Robins, 1998; Child Care Subsidy Dynamics Study Team, 2002; Floge, 1985; Hofferth et al., 1991; Loeb et al, 2004). Other researchers report the percentage of children or families who experience turnovers in arrangements or types of arrangements (Blau & Robins, 1991a, 1991b; Hofferth & Collins, 2000; Lowe et al., 2003; Meyers, 1997; Miller, 2003). Instead of a change of provider, some researchers measure a change in type of care (e.g., from relative to center care), or a change in mode (e.g., employed mother using paid care to employed mother using unpaid care) in a given time period.

Using the third measure, researchers create a prime primary provider ratio (Child Care Subsidy Dynamics Team, 2002), the percentage of time with the prime primary provider in relation to all observed months. When using the fourth meausre, researchers estimate the mean or median duration of either primary or all arrangements (Emlen et al., 1972; Hofferth et al., 1991; Huston et al., 2002; Singer et al., 1980; Wolf & Sonnenstein, 1991). These researchers measure how long, on average, arrangements last.

Design and Analysis of Child Care Arrangement Stability Studies

Differences in purpose, conceptualization, and measures are not the only reasons for a range of arrangement stability study findings. Differences in sampling affect findings, as do selection of the units of analysis and time periods studied. Finally, differences in analysis methods may affect findings.

Sample. Sample selection, composition, and dynamics affect stability findings. There is a wide range in the amount of stability children experience (NICHD, 2001) and the variability is related to key characteristics of child, family, provider, or other element within the ecological system. Stability estimates vary widely based on who is selected for observation. Stability estimates also vary by the number of children from each family and the number of arrangements per child included.

Stability estimates vary based on whether or not the study includes all arrangements the child had over a set period of time or a subset of those arrangements, such as only those that had ended by the date of data collection, or only those that were still continuing at that point. Samples limited to continuing arrangements will not include those that began at the same time but have ended prior to data collection. Such

a sample includes only the longer-lasting arrangements and stability findings from such samples will tend to be higher. If only arrangements that ended are included, then stability findings will tend to be lower as arrangements that began at the same time and are continuing are excluded.

Researchers must select all arrangements that exist at one point in time or all arrangements that begin after a point in time in order to capture the universe of relevant arrangements, that is, all arrangements existing as of a date, or all that begin after a date. Samples composed of either only terminated or only continuing arrangements are only parts of universes of arrangements. With either only terminated or only continuing arrangements, findings describe a subset of arrangements, an unknown portion of all arrangements. Not knowing what arrangements the sample represents makes it hard to interpret the findings.

Units of analysis and time. Although most researchers measure number of arrangements per child (Blau & Robins, 1991a, 1991b, 1998; Child Care Subsidy Dynamics Team, 2002; Emlen et al., 1972; Singer et al., 1980; Hofferth et al., 1991; Huston et al., 2002; Loeb et al., 2004; Meyers, 1997; Miller, 2003; NICHD, 1997, 1999, 2001, 2003; Wolf & Sonnenstein, 1991), some use the mother or family as the unit of analysis (Floge, 1985; Hofferth & Collins, 2000; Lowe et al., 2003; Lowe & Weisner, 2004; Miller, 2003; Scott et al., 2003). Since families may have more than one child, there may well be more changes or higher numbers of arrangements when the family is the unit. Noting the unit of analysis is important when comparing stability findings.

Researchers also vary in the time period they capture, how they capture it, and how they report their findings in terms of time. Time periods covered in stability studies vary from one to eight years. Understanding the effects of time observed is complicated. In surveys of a sample drawn at a point in time, researchers commonly ask parents to recall beginning and ending dates (Blau & Robins, 1991a; Hofferth et al., 1991; Loeb et al., 2004; Lowe et al., 2003; Singer et al., 1980; Wolf & Sonnenstein, 1991), thus extending the time period in which arrangements are measured. In such cases, researchers must deal with recall error. Blau and Robins (1991b, 1998) use data collected annually for a four-week period prior to the survey. With data collected for only 1 of 12 months in each year, many child care changes would not be captured. Such approaches undoubtedly over represent stability because the data represents five partial years.

Regardless of how much time is observed, researchers must report their findings in a time framework, a period of time (days, months, or years). Readers attempting to compare stability findings are challenged by inconsistency in time units used, or worse, the lack of reporting of time units.

A final thought about time relates to the 30 year time period over which the stability studies have been conducted. Over this period of time, growing numbers of children moved into child care (Bachu & O'Connell, 2000).Ttrends in type of care used for preschoolers of employed mothers have been erratic, although there appears to be a consistent increase in use of center care (Casper, Hawkins, & O'Connell, 1994; Hofferth et al., 1991; Smith, 2002). Use of parental care, relative care, and nonrelative, home-based care have increased and decreased over the period from 1985 to 1997

(Smith, 2002).We don't know the extent, if any, to which these changes have affected the stability of child care.

Inclusion of all children. It is common in the stability literature for the researcher to select either the youngest or a random focal child (Blau & Robins, 1991b, 1998; Child Care Subsidy Dynamics Team, 2002; Hofferth et al, 1991; Hofferth & Collins, 2000; Huston et al., 2002; Lowe & Weisner, 2004; Meyers, 1997; Miller, 2003). A major reason for this selection is to avoid the unequal representation of parent characteristics in analyses, in particular, overrepresentation of characteristics of mothers having more children than others.

In a foster care study, Guo and Wells (2003) demonstrated that random selection of one sibling creates two problems, loss of subjects and restriction of the population to whom findings can be generalized. The inclusion of only one child from a multiple-child household limits generalizability of findings and results in loss of data. To the extent that households and their child care usage vary by number of children, then findings from a data set that was created by selecting only one child per household cannot accurately represent all arrangements.

Analysis methods. Researchers, whose goal includes estimating the number of arrangements, transitions, or the primary prime provider ratio, use a variety of analytic methods including descriptive and regression analyses. When time or duration of the arrangement is the outcome, event history analysis is the preferred analytic tool (Allison, 1982, 1995; Singer & Willett, 1994; Singer & Willett, 2003, Willett & Singer, 1995). The researcher must have reliable beginning dates in order to use event

history analysis. Researchers have used a variety of analysis methods to estimate duration and sometimes have not had reliable beginning dates.

Analysis of multiple arrangements presents methodological challenges for estimating duration and transitions. For all measures, it is critical to know if the researcher is reporting findings on the primary or all arrangements.

Stability of Child Care Arrangements

Despite considerable study of child care arrangement stability, differences in conceptualization, measurement, analysis methods, and populations studied limit comparability, and hence our ability to estimate levels of stability. Most researchers have studied special samples and those that have used nationally representative samples, have findings that are difficult to compare because of differences in study purpose and research questions, conceptualization and measurement of stability, and analysis methods.

Blau & Robins (1991a, 1991b, 1998) focus on the relationships among marital status, fertility, and stability of both employment and child care using a sample of young mothers from the National Longitudinal Survey of Youth (NLSY 1979). Child care stability is used as a predictor of employment stability. In addition, although they use nationally representative samples, characteristics of their samples limit the ability of their findings to increase understanding of child care stability. For example, mothers are young (ranging in age from 13 to 28), the mother rather than the child is the unit of analysis, and they use gross measures of transitions such as changes in type of care used rather than measures of arrangement changes. Recall error is a serious issue for their first study as mothers were asked at one time to recall beginning and

ending dates of all arrangements of all children in their first three years of life. The next two studies rely on mother reports of arrangements in the four weeks prior to the survey, hence missing changes that happen at other times.

Hofferth and colleagues' (1991) findings of the duration of child care arrangements of children under 13 years of age and the NICHD Early Child Care Research Network's (1997, 1999, 2001, 2003) findings on number of arrangements of preschool age children both come from samples designed to approximately represent United States families with children. Yet, there are also limitations to the comparability of their findings. Almost all of the arrangements that Hofferth and colleagues analyzed were ongoing at the time of the survey. Although they acknowledged that their findings may underestimate duration, they did not deal with right censoring (that is, the end of the arrangement was not observed). The NICHD Early Child Care Research Network counted all arrangements and did not distinguish primary from supplemental arrangements. They truncated the number of arrangements at the 95th percentile, thus eliminating observations of high numbers of arrangements. Inclusion of all arrangements without differentiating primary from supplemental arrangements may overrepresent the instability the child experiences, but exclusion of the extreme cases may underrepresent instability. All of the other researchers studied special populations of interest, such as low-income families or children in family child care.

Despite problems of comparability, with caution and careful attention to differences, a comparison of the findings of the major child care stability studies increases understanding of the child care experience of children in the United States,

highlights measurement issues, and provides context for a study of the stability of subsidized child care arrangements. In the following pages, I report stability findings by each major measurement strategy: number of providers, transition, prime primary provider ratio, and duration.

Number of Providers

The first stability measure is the simple count of child care arrangements. The NICHD Early Child Care Network (1997, 1999, 2001, 2003) uses the mean number of arrangements as a measure of child care stability in studies in which they are exploring child care impacts on mother and child relationships and child developmental outcomes. By six months children have a mean of 1.80 arrangements and by three years they have experienced a mean of 5.05 arrangements. Youngblade (2003) uses a subsample from a data set created through Midwestern public schools. Whereas 82% of the NICHD sample experienced regular nonmaternal care during the first year of life, a much smaller percentage of these school-age children had experienced child care in their first year. As can be seen in Table 4, Youngblade finds a mean of .45 arrangements per child in the first year compared to the NICHD Early Child Care Research Network finding of a mean 1.80 arrangements in the first six months of life. NICHD asked parents at frequent intervals near the time of the arrangements, whereas parents of third- and fourth-graders had to remember arrangements in the first year of the child's life.

As noted earlier, if the count does not distinguish primary and supplementary arrangements, the ability of this measure to describe the child's experience of stability

is very limited. A mean provider count is difficult to interpret. Reported numbers of providers are reported in Table 1.

Table 1

Stability Estimate: Number of Providers by Age of Child

Author	Number of arrangements
NICHD Early Child Care Research Network, 1997[a,b]	0-15 mo- *M* 2.54 *SD 2.00*
NICHD Early Child Care Research Network, , 1999[c]	0-6 mo- *M* 1.80 *SD 1.02*
	7-15 mo- *M* 1.37 *SD* 1.37
	16-24 mo- *M* 1.15 *SD*1.22
	25-36 mo- *M* 1.56 *SD* 1.53
NICHD Early Child Care Research Network, 2001[d]	0-36 mo- *M*5.05 *SD* 3.36
NICHD Early Child Care Research Network, 2003[e]	3-34 mo-*M* 10.8 *SD* 4.2
Youngblde, 2003	0-12 mo *M* 0.45 *SD* .71

Note. [a] Throughout NICHD studies, paternal is included as a type of care, stability measure is defined as frequency of care starts, and score of 0 is assigned for no nonmaternal care. [b] Mean derived from a sample of 1,153 children. [c]Means derived from subsamples composed of children who had been observed in care; n = 578 at 6 mo, 639 at 15 mo, 601 at 24 mo, 619 at 36 mo. [d] Mean derived from the whole sample at 36 months, n = 1,140. [e] Mean derived from sample at 54 months of child care starts at 34 months, n = 982.

Transition

Change over time has been reported in two ways: those who remain with the same provider (or type of provider) over time and those who change providers during a given time period.

Remaining in same arrangement. The percentage of children remaining in the same arrangement over a year or more may be the most easily understood measure and there is some consistency in findings from studies that use this measure. Despite different methodologies and populations studied, Blau and Robins (1998) and Hofferth and colleagues (1991) found about 50% of children under age 13 in the same arrangement after one year. The Child Care Subsidy Dynamics Team (2002) found from 36% (in Oregon) to 60% (in Illinois) of children under age 13 in the same arrangement at one year. Floge (1985) found 50% of young New York City mothers of young children using the same arrangements after two years, and Loeb and colleagues (2004) found 50% of preschool-age children from families eligible for TANF at time of enrollment were in the same type of care after two years. Floge looked at arrangements per mother rather than child, and Loeb and colleagues measured continuity in the same type of care rather than in the same arrangement.

As displayed in Table 2, it appears about half of children (or mothers) remain in the same arrangement for at least one year, and that preschool-age children may remain in the same arrangement longer.

Table 2

Stability Estimate: Percentage Remaining in Same Arrangement or Mode

Author	Percentage
Blau & Robins, 1998[a]	52%[b] in same mode[c] per year
Child Care Subsidy Dynamics, 2002	36% to 60%[b] with same provider at year[d]
Floge, 1985[1]	50%[e] in same arrangement at 2 years
Hofferth, 1991[1]	56%[b] in same arrangement per year
Loeb et al., 2004	50%[f] in same type[g] after 2 years

Note. [a]Includes parental as a type of care. [b]Arrangements of children 0-12 years. [c]Modes include: mother not employed, mother employed using paid care, and mother employed using nonpaid care. [d] Range is across the five states in the Child Care Subsidy Dynamics Study: Illinois, Maryland, Massachusetts, Oregon, and Texas with Oregon at 36% and Illinois at 60%. [e] Arrangements of mothers with children under six years. Floge found 8% mothers using same arrangements at 4 years. [f]Arrangements of children 1-5.5 years. [g]Loeb and colleagues estimated percentage in same arrangement by type of care and found: 21% center, 4% family child care, 16% kith and kin care, and 9% parental care. Of the other 50% not in the same arrangement, 19% moved to center care and 31% moved to another type of care

Changing arrangements. As noted above, the transition measure has been reported in two different ways, remaining in an arrangement, or, its complement, changing arrangements. Findings from three studies using nationally representative samples indicate that from 17% of mothers with children under 13 (Hofferth & Collins, 2000) and from 27% to 30% of mothers with children under 6 (Blau & Robins, 1991b) experience one or more transitions per year, and that children of nonemmployed mothers experience fewer changes (Blau & Robins, 1991a). Together, the findings from these three studies indicate that approximate a quarter of children of employed mothers experience a change in arrangements per year. It is important to note that parental care is included as a type of care in all three studies. This inclusion affects transition measure results as a change from nonparental to parental care is treated the same as transitions from one nonparental provider to another nonparental provider.

Some studies that report percentage of children or mothers who experience changes in arrangements are focused on special populations with multiple risk factors. Meyers (1997) studied parents enrolled in a work readiness program related to welfare reform. She found that 74% of children experienced at least one change in arrangement in one year, 30% experienced two or more changes, and younger children experienced the most changes. Lowe and his team (2003) worked with parents who were part of New Hope, one of the nation's welfare experiments. Working intimately with 44 families selected from both controls and persons involved in the experiment, the team found that about a third of families experienced instability in each of the five seasonal periods they used to analyze their findings. They differentiated between

changes in child care that are predictable (linked to school year or child maturation) and instability, which is defined as changes that are disruptive (e.g., sudden loss of job or caregiver). They found that 84% of families experienced change and 45% instability over the two years.

As can be seen in Table 3, higher percentages of low-income families and children appear to experience arrangement changes. Having low income and/or participating in welfare programs may increase the level of instability.

Table 3

Stability Estimate: Percentage of Employed Mothers, or Children with Employed Mothers, Who Changed Arrangements

Author	Percentage
Blau & Robins, 1991a	21% children per year[a]
Blau & Robins, 1991b[b]	27% - 30% mothers per year[c]
Hofferth & Collins, 2000[b]	17% mothers per year
Lowe et al., 2003	84% families in 2 years[d]
Meyers, 1997	74% children per year[e]
Miller, 2003	56% changed in 24 months[f]
Moss & Brannen, 1987	28% children had change in primary[g]

Note. [a]Blau & Robins measured changes in type of arrangement rather than specific arrangement. [b]Included parental as a type of care. [c]Blau and Robins measured change in mother's state (using relative or nonrelative). [d]Lowe and colleagues found 45% families experienced chronic change in two years and 33% families experienced instability in each of five seasonal periods over the two years. [e] 30% children started and ended two or more arrangements per year. [f]4% -9% changed arrangements per month and 38% dropped all care for at least one month in 24 months. [g]Sample was composed of children under 18 months with mothers who resumed full-time employment within 9 months of birth.

Prime Primary Provider Ratio

A child's experience of continuity in relationship with the provider is quite different in the case of one primary provider supplemented by one or more other

providers, than in the case of a child who experiences a series of different providers. In their struggle to address the issue from a child perspective, the Child Care Subsidy Dynamics Team (2002) created the primary provider ratio which I am calling the prime primary provider ratio (PPPR). In this study the primary provider is the one that provided the most hours in the month, whereas in the Subsidy Dynamics study the primary provider was the one that provided the most months of care. I call the provider that provided the most months of care the prime primary provider. Both the Subsidy Dynamics and this study look only at children's subsidized arrangements.

The PPPR equals the number of months with the prime primary provider divided by the total number of observed months. If a child is with the same provider for all observed months, the ratio will be 1, even if other providers supplement the prime primary provider's care. A ratio of less than 1 indicates that a child's experience in care is less stable. The Child Care Subsidy Dynamics Team found the ratio at 12 months ranged from .75 in Massachusetts to .88 in Texas.

Duration of Child Care Arrangements

As expected, the studies of beginning and terminated arrangements found shorter durations (3 to 8 month medians) than did studies of continuing arrangements (medians of a year or longer). When researchers were unclear about which arrangements were included in the same sample, findings are difficult to interpret.

Huston and her team (2002) analyzed data from three different welfare reform experiments; families in all three samples were very low-income. Arrangements included appeared to be a combination of those whose beginning was observed, that had been terminated, and that were ongoing. They reported a wide range of durations

between projects and between different types of care. They found very short durations for nonrelative informal care (from 1.6 to 4.2 months) and longer durations for both formal care (5.8 to 10.3 months) and relative care (3.8 to 12.5 months).

Both Emlen and colleagues (1972) and the National Day Care Home Study (NDCHS) team (Singer et al., 1980) studied the stability of family child care and both collected data in the 70s. Yet Emlen and colleagues found durations of continuing arrangements to last about a year and the NDCHS team found arrangements to last over 3 years. Emlen and colleagues found new and terminated arrangements to have median durations of 3 months or less. The NDCHS Team analyzed new, continuing, and terminated arrangements together, complicating interpretation of their findings. Differences in findings between these two studies stem from difference in sample selection and sample composition (inclusion of continuing as well as new and terminated arrangements). The NDCHS Team (1980) identified arrangements by sampling family child care homes, of which two-thirds were either regulated or part of a family child care system, whereas Emlen and colleagues (1972) used a mix of parent and provider recruitment strategies to create their sample of arrangements. The mix included unregulated and less professional home-based caregivers. It is likely that the more connected and professional NDCHS family child care homes were also more stable and that provider stability affected the stability of arrangements.

As can be seen in Table 4, child care arrangements sampled at a point in time appeared to last, on average, a year or less, and samples that contained arrangements whose beginnings were observed, or only terminated arrangements, had shorter durations. The NDCHS study demonstrated that some children have very stable child

care experiences and this finding was supported by Emlen and colleague's finding that although new arrangements averaged only three months, these same arrangements ranged from less than a week to 99 weeks, almost two years.

Methodological issues including sample selection and design and method of dealing with left and right censored cases affect the validity of duration findings. Validity of reported duration findings varies.

Table 4

Stability Estimate: Mean or Median Duration of Child Care Arrangements in Months

Author	New		Terminated		Continuing		Comb/dk	
	M	*Mdn*	*M*	Mdn	*M*	*Mdn*	*M*	*Mdn*
Emlen et al., 1972[a]	4	3[b]		2		12[b]		
Emlen et al., 2000								10
Hofferth et al., 1991				8		12[c]		
Huston et al., 2002							1.6 – 12.5[d]	
Singer & Willett, 1994[1]								37
Wolf & Sonnenstein, 1991			7.8					

Note. [a]Emlen and colleagues and the National Home Day Care Study team were measuring durations of only family child care arrangements. [b]Emlen and colleagues found that new arrangements ranged from less than one week to more than 99 weeks. They found that continuing arrangements lasted 6 months when measured at one year but eventually lasted for over a year. [c]Hofferth and colleagues found the median for children with employed mothers was 13 months and for nonemployed mothers was 9 months. It appears that they used the survey date as the end date for continuing arrangements but they may not have captured all arrangements that began at the time of the earliest beginning date. [d]Durations varied by project and by type of care with 1.6 months being the mean duration for nonrelative care in the New Chance Project and 12.5 months being the mean duration for relative care in the Minnesota Family

Investment Project.

We do not know the extent to which the four measures describe the same phenomenon. All but one study used only one measure with their data. In order to assess the relationship amongst the four measures, I use all on 4 years of Oregon child care subsidy data.

Chapter 3

Methods

Sample

The study's primary purpose is to increase understanding of child care arrangement stability measurement. A secondary purpose is to increase understanding of the stability of subsidized child care arrangements in Oregon. Analysis of Oregon administrative data support both purposes as it contains variables needed for the four major stability measures and records for every subsidized arrangement over 4 years.

Data Sources

The Oregon Department of Human Services provided us with data from which identifying information had been removed. Subsidy data came in two files, one of parents and the other of children. The child data set included all information on providers. Although children had from 1 to 5 providers in a month, there were 2 or fewer providers in over 99% of observed months. Therefore only the two providers that provided the highest number of hours of care in that month were retained. I called the provider with the highest number of hours in a month the "primary provider", and the one with the second highest number of hours the "secondary provider." The parent file contained household data. Additional adult descriptors were collected in a third file, the Client Maintenance System (CMS).

I merged first the parent and child file and then CMS. Observations were limited to arrangements of children under age 5 in the first observed month in female-headed households. Included arrangements began between October 1997 and September 2001 (see Appendix C for detail.)

Characteristics of Children and Families in Analysis Data Set

Table 5 describes household and child characteristics of those included in the analysis data set. Characteristics that have been shown to be associated with child care usage were selected. The average household had a single adult and two children although not all children in a family had a child care subsidy. The number of children in a household enrolled varied over time (analysis not shown).

The mean household income was below $600, partially because 36% of households received TANF in their first observed month and TANF payments were not reported as household income. An employed parent headed another 51% of households in the first month. The remaining households received a subsidy for reasons such as participation in assessment or educational activities.

English was the primary language of almost all households. The average child in the analysis sample was a little over 2 years old. Participating children were members of families with children up to 18 years of age but the average age of the oldest child in the families was a little over 4 years.

Table 5

Characteristics of Female-headed Households with Children under 5 Who Entered Oregon's Child Care Subsidy Program between November 1997 and September 2001

Variable	No. missing	% missing	Min	Max	M	SD
No. adults in household	619	1.27	1	4	1.09	0.002
No. children in household	619	1.27	1	11	2.02	0.005
No. children w cc subsidy	0	0.00	1	8	1.94	0.004
Mother's age (yrs)[1]	196	0.40	14	65	25.42	0.027
Mother's education[a, b]	9,887	20.23	0	17	11.10	0.010
Household income	0	0.00	$0.00	$3,528	$589	$2.90
Percentage employed[c]	0	0.00	0	1	.51	0.002
Percentage on TANF[c]	0	0.00	0	1	.36	0.002
English primary language[d]	0	0.00	0	1	.97	0.001
Child's age (mos)	0	0.00	0[e]	59	24.95	0.080
Age oldest child (mos)	0	0.00	0[e]	227	49.27	0.159
Age youngest child (mos)	0	0.00	0[e]	59	19.75	0.071

Note. $N = 48{,}862$. Characteristics were as of the first observed month. [a]Mother was defined as the female with care, custody, and control of the child. [b]Education was defined as highest year completed. [c]4 % of mothers were both employed and on TANF in the first observed month. [d] English was primary language = 1, else 0. [e] Children less than 1 month of age were coded 0 months. Provider and Arrangement Characteristics

Table 6 captures key descriptors of the child care providers that cared for children whose care was subsidized. There are more arrangements than providers as providers may care for more than one child and therefore be involved in more than one arrangement. Two thirds of primary providers and three fourths of secondary providers are family child care homes, non-related adults providing care in the provider's home.

Table 6

Number and Percentage of Providers and Arrangements by Type of Care

Type of care	No. (%) primary providers[a]	No. (%) primary providers arrangement[b]	No. (%) secondary providers[c]	No. (%) secondary provider arrangements[d]
In-Home provider	2,974 (8)	4,939 (5)	837 (8)	1,289 (7)
Relative	8,401 (22)	13,017 (13)	983 (10)	1,726 (9)
Family child care	25,704 (67)	62,641 (61)	7,556 (76)	12,990 (69)
Center	899 (2)	16,939 (16)	591 (6)	2,709 (14)
Total	37,975 (100)	97,536 (100)	9,967 (100)	18,714 (100)

Note. [a] missing = 302; [b] missing = 5,316, [c] missing = 354, [d] missing = 1,480

Inclusion of all children in a family. Results of an ANOVA using 3 categories of number of children and key descriptive variables showed that there were significant differences between families by number of children on all characteristics. The analysis is reported in Appendix D. Given that households and child care arrangements did vary significantly by number of children in the household, and that arrangements were the focus of this study, I decided to include all children under 5 in the analysis data set. Inclusion of all children increased the likelihood that findings represent all subsidized arrangements of Oregon preschool-age children in female-headed households.

Data format

Data were captured in a person-period data set in which each observed month for each child had its own line. This format supported all stability analyses and was the most appropriate format for survival analysis.

Measures and Analysis Strategy

Multiple Arrangements

I estimated the number and percentage of children who had more than one arrangement in a month. I compared primary and secondary arrangements and explored the relationship between them.

Stability Measures

In order to increase understanding of child care arrangement stability measures, I used the four measurement strategies found in the literature: number of providers, transition, prime primary provider ratio, and duration.

Number of providers. The number of providers measure addresses the question of how many different primary and secondary providers cared for the child over the

time the child was observed. Answering the question required creating variables and counting frequencies.

As reported earlier, children had up to 5 providers per month, but there were 2 or fewer providers per child in over 99% of observed months. I sorted on number of hours of care provided and created the primary provider as the one with the most hours in that month and the secondary provider as the one with the next highest number of hours. The small number of other providers was dropped.

In the analysis file I created a variable for the number of months with each primary and secondary provider. I identified the primary provider with the most months for each child, called that the prime primary provider and created a variable for the number of months with that prime primary provider. I then did a frequency of all primary and secondary provider months that created a count of each per child. For each child I then added the count of primary and secondary providers to create a summary number of primary and secondary providers per month. Finally, I calculated the mean number of primary, secondary, and summed primary and secondary providers for each child.

The new variables (prime primary provider, number of months with prime primary provider, number of primary providers, number of secondary providers, number of primary and secondary providers, mean number of primary providers, mean number of secondary providers, mean number of primary and secondary providers) were merged onto the analysis file. A single value for each of these variables was merged onto each observed month for each child. Descriptive statistics were calculated using the last observed month for each child. Ability to calculate descriptive

statistics in a file with only one observation per month was essential to avoid values of children with more observed months skewing findings.

Transition. The transition measure answers two questions. First, did the child remain with the same provider? The second question reverses the first; did the child change providers at least once?

Using a data set sorted by both child and service months, I created a variable, transition, with three values: 0 if not the same provider as in the previous month, 1 if it was the same provider as in the previous month, and 2 if it was the first observed month for the child. On each observed month for each child the same provider variable had a value of 0, 1, or 2. If an observed month were the first observation for a child, a measure of whether or not they were with the same provider in the previous month would be meaningless. Therefore, for the transition analysis the observations in which the same provider variable equaled 2 (first observed month for the child) were excluded.

For each child, I created a mean transition value which represented the percentage of months in which the child did not experience a transition. A mean of 0 indicated that the child had changed providers in each month, a value greater than 0 but less than 1 indicated that there had been at least one change in providers, and a value of 1 meant the child had been with the same provider for all observed months. The mean value of the transition variable was merged onto each month of the analysis file. I did a frequency analysis on the mean transition variable. The percentage with a value of 1 represented the percentage of children who experienced no transitions. The percentage with a value of less than 1 represented the percentage of children who

changed providers at least once.

Prime primary provider ratio. The prime primary provider ratio measure (PPPR) addresses the question of the extent to which the child has one stable provider. When I created the number of provider variable, I also created variables needed to calculate the PPPR: the prime primary provider, the number of months with that provider, and the cumulative time each child had been observed. The PPPR was the number of months with the prime primary provider divided by cumulative months the child was observed. A value of 1 indicated that the child was with the same provider for all observed months; the value decreased as the percentage of observed months with the primary provider decreased. The PPPR value for each child was merged onto the analysis data set.

Duration of arrangements. An arrangement is the combination of an individual provider and an individual child. The arrangement, rather than the child, is the unit of analysis for the duration measure. Measuring the duration of arrangements answers the question of how long, on average, an arrangement spell lasts.

The event of interest was the ending of an arrangement spell and its beginning was the first month that an arrangement was observed. The ending of some arrangements were not observed (right censored) but survival analysis is designed to account for right censoring.

I did survival analysis using both the Lifetable and Kaplan-Meier estimators (only Kaplan Meier findings are reported as results were very similar). The analysis produced three major findings, (a) a median duration, (b) a hazard rate (the probability of ending given that an arrangement had lasted to that point in time), and

(c) a survival rate (the percentage of arrangements that had survived to a point in time). In survival analysis, the median is the preferred measure of central tendency because one has not observed how long right-censored arrangements last, the problem of right-censored data. The median duration is the point at which half of arrangements have ended. Plots of both the hazard and survival functions graphically depict when arrangements were at highest risk of ending and the percentage of arrangements that survived over time, respectively.

Measurement over Time

Stability describes the time dimension of child care arrangements. A stability measure value gets its meaning in relation to the time observed. A value of 1 for the number of providers measure at 3 months has a very different meaning than a value of 1 at 12 months and a dramatically different meaning than a value of 1 at 36 months.

I reported all stability measures at the following 11 intervals (in months): 1, 2, 3, 4 to 6, 7 to 9, 10 to 11, 12, 13 to 18, 19 to 24, 25 to 36, and 37 to 42. I used 1 month intervals for the first 3 months as over a quarter of the children were not observed after 3 months. As 12 months was the most commonly reported time period in the literature, I used a 12 month interval to increase comparability of study findings with those from previous studies. Clusters of months were more meaningful for the remainder of observed months.

Comparison of Stability Measures

One of the study research questions is the extent to which the four measures are measuring the same construct. The unit of analysis for three of the measures is the child, whereas for the fourth, duration, the unit is the arrangement, the combination of

a child and a specific provider. I estimated Pearson correlations for the three child-level measures and found high levels of correlation, but with only three measures, a confirmatory factor analysis was not possible. Finally, I examined the face validity of the four measures; asking the extent to which the four measures describe stability and if any of the four add information that was not provided by one of the other measures?

Chapter 4

Results

Using four years of child care subsidy data, I assessed the level of child care stability of subsidized child care arrangements of children under age 5 with the four major child care arrangement stability measures that emerged from the literature: number of providers, transition, prime primary provider ratio, and duration of arrangements. I created a graphic representation of child care arrangement stability to help the reader understand arrangement stability and specific findings. Appendix E contains the figure and a key for interpretation

In this chapter, I first summarize findings. After the summary, I report findings on (a) multiple arrangements, (b) results for each of the four measures, (c) a summary of findings from all four measures, and finally, (d) an analysis of the relationship of the measures to each other.

Summary of Results

Approximately a quarter of children had multiple arrangements in one or more months. Children observed for 12 months had a mean of 2.40 primary providers and 2.88 primary and secondary providers. In the same time period, almost a third of children (30%) did not experience a transition, while the other two thirds had one or more changes in providers. Even though over two thirds of children experienced 1 or more transitions in a year, 73% of months were with the primary provider who provided the most months of care. Half of arrangement spells lasted for 3 months or less. Less than a fifth of arrangement spells (18%) were resumed, so it was not just arrangement spells that were short; for the most part, arrangements were short.

Looking at the child level, 39% of children had one arrangement spell and then left the program. Of the 61% of children with more than 1 arrangement spell, about 15% returned to the same arrangement after a break of 1 month or more. The rest (85%) went to one or more new arrangements, most often for just one spell.

Multiple Arrangements

Approximately one quarter (26%) of children had a secondary provider in one or more observed months, concurrent providers. For only 2% of these children did the secondary provider remain the same in all observed months. Among the children who had secondary providers the number of different providers ranged from 1 to 12 with a mean of 1.60 (*SD* .99) providers.

There was some movement between being the first and secondary provider. For 13% of all observed children, the secondary provider became the primary provider in the next month. For 3% of all observed children, the primary provider became the secondary provider in the next month.

Secondary providers were slightly more likely to be centers than were primary providers. Whereas centers made up only 2% of primary providers, they represented 6% of secondary providers. Secondary providers were less likely to be relatives; 22% of primary providers were relatives versus 10% of secondary providers that were relatives.

Restricting the analysis to the 7% of months in which there was a secondary provider, over half of the months involved two different family child care providers. Almost a fifth (19%) involved a center in combination with another type of care.

Slightly over 1 in 10 (13%) involved a relative with another type of provider. Relatives were never combined with either family child care or in-home care.

Number of Providers

In a given month, the number of providers ranged from 1 to 5, however, the vast majority (99.7%) of children had no more than 2 providers in a month. As shown in Table 7, over the 47 observed months, children had from 1 to 25 providers with a mean of 2.5 providers. Both the maximum and mean number of providers increased as the children were observed for more months. Although almost half of all children observed over the 47 months had only one provider, the percentage of children with one provider dropped steadily from 71% of those observed for 3 months to 16% of those who were observed over 2 years.

Table 7

Number of Providers by Cumulative Time on Subsidy

No. months children observed	% children observed by month(s)[a]		Max no. primary & secondary providers	*M* primary providers (SD)	*M* primary & secondary providers (SD)	% children with *M* primary providers = 1[b]
	%	Cum. %				
1	9	9	2	1 (.00)	1.02 (.14)	98
2	10	19	4	1.12 (.32)	1.18 (.47)	85
3	9	28	5	1.28 (.49)	1.38 (.68)	71
4 - 6	19	47	9	1.60 (.75)	1.78 (1.01)	52
7 - 9	13	60	10	2.00 (1.03)	2.32 (1.42)	37
10 - 11	6	66	11	2.32 (1.24)	2.74 (1.71)	31
12	3	69	11	2.40 (1.34)	2.88 (1.87)	30
13 - 18	13	82	16	2.74 (1.54)	3.35 (2.13)	23
19 - 24	8	90	16	3.18 (1.83)	4.00 (2.57)	18
25 - 36	8	98	21	3.65 (2.18)	4.78 (3.20)	16
37 - 47	2	100	25	3.84 (2.43)	5.36 (3.86)	16

Note. $N = 48{,}862$. [a] Percentage of children observed in that month or cluster of months. [b] Among children observed in that month or cluster of months, the percentage whose mean value of the number of primary providers is 1.

Transition

In each month but the first, there was a measure of whether the child experienced a transition from the provider of the previous month. The first month was excluded as there could not have been a change in the first month. The transition measure captured change in providers. As shown in Table 8, there was very little variance in the value of the transition variable over time, from 88% at the second month to a low of 84% for children observed from 4 to 6 months.

Transitions have typically been reported as the percentage of children who remained with the same provider over a period of time, the percentage who never experienced a transition. As children remained in the subsidy program for more months, the percentage who stayed with the same provider steadily decreased. About half (54%) of those observed for 3 to 6 months remained with the same primary provider. Of children observed for a year, less than a third (30%) remained with the same primary provider, and by 3 years fewer than one-fifth (17%) had the same primary provider. Over four fifths (83%) changed primary providers at least once.

Table 8

Transition

No. months children observed	Observed Children			Transition	No. (%) children where primary provider same in all observed months	No. (%) of children for whom the primary provider changed at least once
	No.	%	Cum. %			
2	4,727	10	19	.88 (.32)	4,162 (88)	565 (12)
3	4,186	9	28	.86 (.25)	3,079 (74)	1,107 (26)
4 - 6	9,070	19	47	.84 (.20)	4,905 (54)	4,165 (46)
7 - 9	6,145	13	60	.84 (.16)	2,389 (39)	3,755 (61)
10 - 11	3,119	6	66	.84 (.15)	982 (31)	2137 (69)
12	1,510	3	69	.86 (.14)	456 (30)	1,054 (70)
13 - 18	6,467	13	82	.86 (.13)	1,572 (24)	4,895 (76)
19 - 24	4,055	8	90	.87 (.11)	809 (20)	3,246 (80)
25 -36	4,252	8	98	.89 (.09)	729 (17)	3,523 (83)
37 - 47	1,086	2	100	.91 (.08)	194 (18)	895 (82)

Note. $N = 44{,}620$ rather than 48, 862 due to exclusion of first month observations.

Prime Primary Provider Ratio

I called the primary provider that gave the most months of care the prime primary provider. A child who remained with the prime primary provider for all observed months had a primary provider ratio of 1 and the ratio moved toward 0 as a child had more time with other providers. As shown in Table 9, the prime primary provider ratio decreased as the amount of observed time increased. For children who received two months of care the ratio was .94, whereas the ratio was .73 for children who received subsidized care for a year. That is, for children observed for two months, 94% of observed months were with a child's prime primary provider, whereas by 1 year in subsidized care, 73% of observed months were with a child's prime primary provider. For children in subsidized care for over three years, 65% of observed months were with the same primary provider.

The percentage of children who remained with the prime primary provider for all observed months decreased as observed time increased. Whereas 88% of children observed for only two months were with their prime primary provider for all observed months, less than a third of children who were observed in subsidized care for 12 months were still with their prime primary provider (30%). By the time children had been observed in subsidized care for 3 years, only 17% remained with the same primary provider for all months

Table 9

Prime Primary Provider Ratio (Mean Percentage of Months with Prime Primary Provider

Observed months	No. (%) children			M PPPR (SD)	No. (%) children where PPPR = 1
	No.	%	Cum. %		
1	4,242	9	9	1.00 (00)	4,242 (100)
2	4,727	10	19	.94 (.16)	4,162 (88)
3	4,186	9	28	.91 (.16)	3,079 (74)
4 – 6	9,070	19	47	.82 (.21)	4,905 (54)
7 – 9	6,145	13	60	.76 (.23)	2,389 (39)
10 – 11	3,119	6	66	.73 (.23)	982 (31)
12	1,510	3	69	.73 (.24)	456 (30)
13 – 18	6,467	13	82	.69 (.24)	1,572 (24)
19 – 24	4,055	8	90	.67 (.24)	809 (20)
25 – 36	4,252	8	98	.66 (.24)	729 (17)
37 - 47	1,086	2	100	.65 (.24)	194 (18)

Note. $N = 48{,}862$ children

Duration of Arrangements

Previous measures (number of providers, transition, and prime primary provider ratio) were done at the child level. Duration was done at the arrangement level. An arrangement was defined as a period of time in which an individual child was with an individual provider and the analysis was limited to arrangements with the primary provider.

Time in an arrangement was not always continuous; an arrangement spell was continuous time in an arrangement but arrangements could have more than one spell. A break of one month or more defined the end of an arrangement spell. Survival analysis provided a measure of the amount of time in an arrangement spell. Table 10 reports Kaplan-Meier estimates of the number of months of the first primary arrangement spell by the number of months the children were observed. The median arrangement spell length remained basically the same as observed time increased. The median arrangement spell for children observed 3 months was 3 months and remained 3 months through 3 years of observed time. It increased to 4 months for the small group of primary arrangements of children who were observed for over 3 years. A Life Table analysis showed similar results with median estimates of 3.19 months for children observed for 4 through 6 months and 3.96 months for those observed through 3 years.

Eighty–two percent of arrangements had one spell, so the median spell length represented the time the child and provider were together. Eighteen percent of primary arrangements were resumed at least once after a break of 1 or more months. Although there were up to 9 arrangement spells per child observed, the mean number of

arrangement spells was never higher than the 1.72 spells per primary arrangement found for children observed for over 2 years.

When children returned to the same provider, the later spells were of similar length to first spells; half had ended by 3 months. The amount of time between arrangement spells varied. Ten percent of arrangement spells had been resumed after a month break. The majority of the remaining 8% of arrangements that had more than one spell were resumed within a year, but a few were resumed after a break of 3 years or more.

Table 10

Duration of Primary Child Care Arrangements by Months that Children Were Observed

No. months children observed	Mean no. (SD) of arrangements per child	No. of arrangements	Mean no. (SD) of arrangement spells	Duration of first spell of each primary arrangement			No. (%) of arrangements that were resumed	Duration of second spell of primary arrangements		
				25th	50th	75th		25th	50th	75th
1	1 (.00)	4,242	1 (.00)	1	1	1				
2	1.12 (.32)	5,292	1.04 (.20)	2	2	2	205 (4)	1	1	1
3	1.28 (.49)	5,369	1.09 (.29)	2	3	3	373 (7)	1	1	2
4 - 6	1.60 (.75)	14,473	1.16 (.42)	2	3	4	1,631 (11)	1	2	3
7 - 9	2.00 (1.03)	12,280	1.30 (.59)	2	3	5	2,120 (17)	1	2	4
10 - 11	2.32 (1.24)	7,242	1.36(.65)	2	3	6	1,423 (20)	1	3	5
12	2.40 (1.34)	3,628	1.41 (.72)	2	3	6	736(20)	1	3	6
13 - 18	2.74 (1.54)	17,737	1.48 (.82)	2	3	6	3,921 (22)	2	3	6
19 - 24	3.18 (1.83)	12,881	1.61 (.96)	2	3	7	3,220 (25)	2	4	8
25 - 36	3.65 (2.18)	15,529	1.72 (1.08)	2	3	8	4,031 (26)	2	4	9
37 - 47	3.84 (2.43)	4,179	1.72 (1.05)	2	4	11	1,072 (26)	2	5	12

Note. $N = 102,852$ primary arrangements

A hazard function graph depicts the risk of an arrangement spell ending in a month, given that it had lasted until that month. For primary arrangement spells, the risk was greatest at 3 months and steadily decreased for those arrangements that lasted beyond 3 months. The slight rise in risk observed at 46 months was an artifact of small numbers at the end of the observation period.

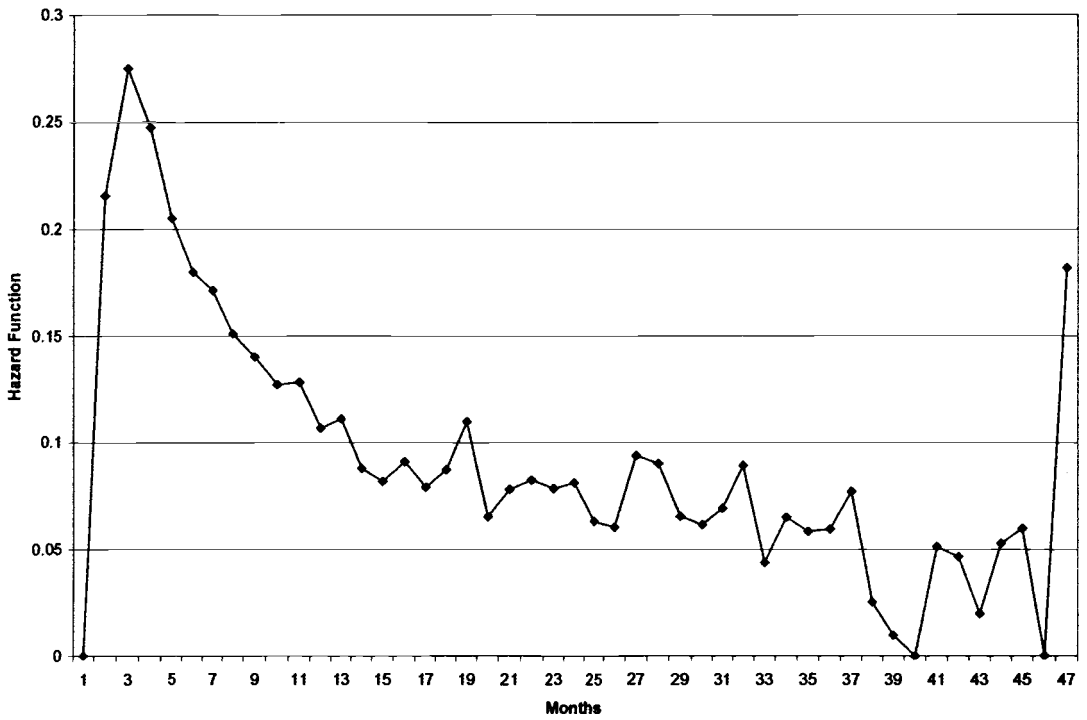

Figure 2. Hazard Function

The survival function graph in Figure 3 fills out the picture presented by the graph of the hazard rate. The percentage of primary arrangements that survived (were continuing) dropped rapidly after 3 months. By six months, only 20% of primary arrangement spells had survived, and by 12 months only 7% of primary arrangement spells continued.

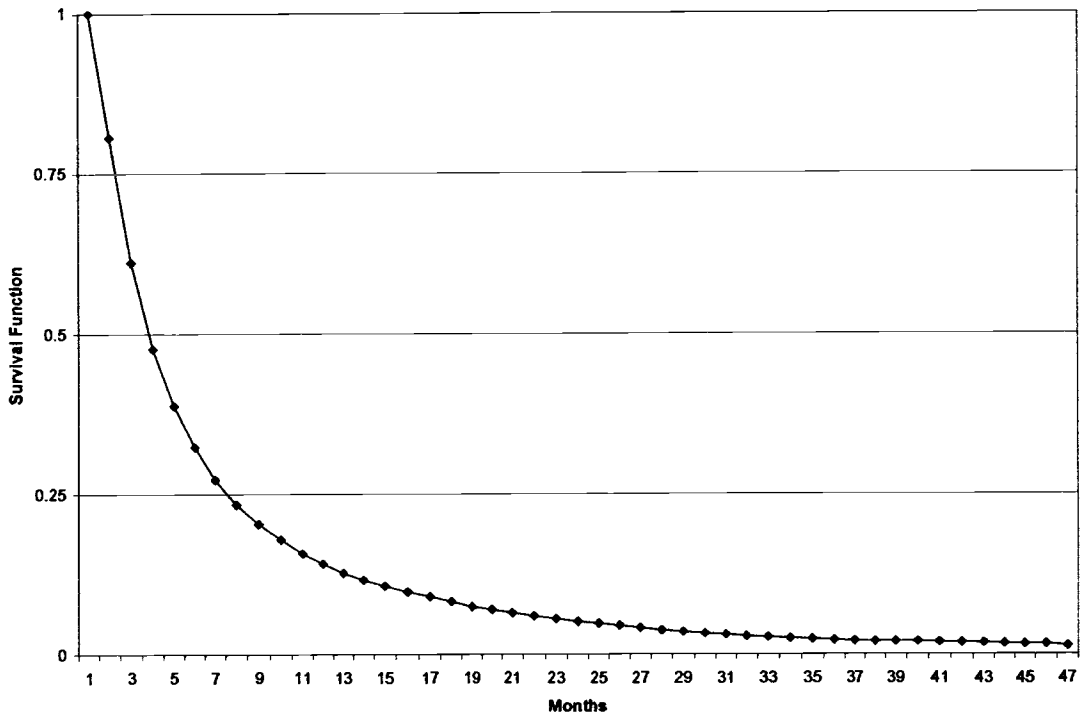

Figure 3. Estimated Probability of Arrangement Survival

Comparison of Four Stability Measures

Comparison of the four stability measures (Table 11) shows that values of two of the measures changed as number of observed months increased; the number of providers steadily increased as observed time increased and the prime primary provider ratio steadily decreased. There was little change in the values of the transition or duration measures over time.

For the three child-level measures (number of providers, transitions, and PPPR), a value of 1.00 represented the highest level of stability, that is, for a child with the highest level of stability the number of providers was 1, the mean transition value was 1, and the prime primary provider ratio was 1. A child with the highest level

of stability had 1 primary arrangement, no transitions, and all observed months were with the prime primary provider.

Table 11

Comparison of Four Child Care Arrangement Stability Measures over Time

Time	Children[a]	No. Providers		Transition[b]	% months with prime primary provider	Arrangement[c] duration
No. months children observed	% children by mos observed	*M (SD)* primary & secondary providers	*M (SD)* primary providers	*M (SD)* % months no change prime primary provider	*M (SD)* primary provider ratio	*Mdn* months arrangement spells last
1	9	1.02 (.14)	1.00 (.00)		1.00 (.00)	1
2	10	1.18 (.47)	1.12 (.32)	.88 (.32)	.94 (.16)	2
3	9	1.38 (.68)	1.28 (.49)	.86 (.25)	.91 (.16)	3
4 to 6	19	1.78 (1.01)	1.60 (.75)	.84 (.20)	.82 (.21)	3
7 to 9	13	2.32 (1.42)	2.00 (1.03)	.84 (.16)	.76 (.23)	3
10 to 11	6	2.75 (1.71)	2.32 (1.24)	.84 (.15)	.73 (.23)	3
12	3	2.88 (1.87)	2.40 (1.34)	.86 (.14)	.73 (.24)	3
13 to 18	13	3.35 (2.13)	2.74 (1.54)	.86 (.13)	.69 (.24)	3
19 to 24	8	4.00 (2.57)	3.18 (1.83)	.87 (.11)	.67 (.24)	3
25 to 36	8	4.78 (3.20)	3.65 (2.18)	.89 (.10)	.66 (.24)	3
37 to 47	2	5.36 (3.86)	3.84 (2.43)	.91 (.08)	.65 (.24)	4

Note. [a]N = 48,862 children. [b]n = 44,620 children as first month observations deleted. [c]N = 102,852 arrangements.

Additional analyses, reported in Table 12, increased understanding of the relationship of the four measures. Adding the percentage of children who did not experience a transition showed that although the percentage of months with no transition remained over 80%, the percentage of children who did not experience a transition steadily declined from 88% at two months to 18% of children observed over 3 years. Also evident in this table is the group of children whose child care arrangements were very stable. At 12 months, 30% of children had one primary provider, no transitions (percentage who remained with the primary provider), and all months were with the prime primary provider (PPPR = 1).

Table 12

Comparisons of Four Stability Measures with Additional Statistics

Time	Children	No. Providers		Transition[a]		PPPR		Duration[b]	
No. mos	No.(%) children	*M (SD)* primary & secondary	*M (SD)* primary	No. (%) with same provider	No. (%) change provider	*M (SD)* *PPPR*	No. (%) children PPPR = 1	*M (SD)* arrange-ments per child	*Mdn* mos
1	4,242 (9)	1.02 (.14)	1.00 (00)			1.00 (.00)	4,242 (100)	1 (00)	1
2	4,727 (10)	1.18 (.47)	1.12 (.32)	4,162 (88)	0 (00)	.94 (.16)	4,162 (88)	1.12 (.32)	2
3	4,186 (9)	1.38 (.68)	1.28 (.49)	3,079 (74)	1,010 (24)	.91 (.16)	3,079 (74)	1.28 (.49)	3
4-6	9,070 (19)	1.78 (1.01)	1.60 (.75)	4,905 (54)	4,127 (46)	.82 (.21)	4,905 (54)	1.16 (.42)	3
7-9	6,145 (13)	2.32 (1.42)	2.00 (1.03)	2,389 (39)	3,755 (61)	.76 (.23)	2,389 (39)	2.00 (1.03)	3
10-11	3,119 (6)	2.75 (1.71)	2.23 (1.24)	982 (31)	2,137 (69)	.73 (.23)	982 (31)	2.32 (1.24)	3
12	1,510 (3)	2.88 (1.87)	2.40 (1.34)	456 (30)	1,054 (70)	.73 (.24)	456 (30)	2.40 (1.34)	3
13-18	6,467 (13)	3.35 (2.13)	2.74 (1.54)	1,572 (24)	4,895 (76)	.69 (.24)	1,572 (24)	2.74 (1.54)	3
19-24	4,055 (8)	4.00 (2.57)	3.18 (1.83)	809 (20)	3,246 (80)	.67 (.24)	809 (20)	3.18 (1.83)	3
25-36	4,252 (8)	4.78 (3.20)	3.65 (2.18)	729 (17)	3,523 (83)	.66 (.24)	729 (17)	3.65 (2.18)	3
37-47	1,089 (2)	5.36 (3.86)	3.84 (2.43)	194 (18)	895 (82)	.65 (.24)	194 (18)	3.84 (2.43)	4

Note. Kaplan Meier estimates are reported. [a] The base for the transition measure analysis was 44,620 as first observed month was excluded. [b] Duration analysis was based on 102,852 arrangements.

Correlation of Four Stability Measures

Three of the four measures are child-level, while durations are measured at the arrangement level. Therefore, the question of the extent to which the measures are related was only relevant for the three child-level measures. I used a Pearson correlation to assess the relationship. As reported in Table 13, the three-child-level measures were highly correlated (.78 to 1.00), and the level of correlations decreased slightly as observed time increased.

The number 1 represents the highest level of stability on all three of the child-level stability variables; number of providers equaling 1 means the child had only one provider, the mean transition value equaling 1 means that the child had the same provider over all observed months, and the prime primary provider ratio equaling 1 means that the the child was with the same provider for all observed months. At the highest level of stability, each of the child-level stability measures was the same. It was when the child experienced change that the measures captured different aspects of that change.

I removed all children who had the highest level of stability from the sample and redid the correlation analysis. Correlations remained high, never falling below .62. At 1 year, correlations ranged from .65 to .90.

The number of providers and transition measures were more highly correlated than were number of providers and the PPPR. The lowest correlation levels were observed between the transition and PPPR measures.

Table 13

Pearson Correlations between Number Of Providers, Transitions, and Prime Primary Provider Ratio at 2, 12, and 36 Months

		At 3 months			At 12 months			At 36 months		
	Measure	1	2	3	1	2	3	1	2	3
1	Number of main providers	--			--			--		
2	Transitions measure	-1.00	--		-.95	--		-.92	--	
3	PPPR	-.99	.99	--	-.86	.83	--	-.84	.78	--

Note. Using the measure of primary and secondary providers combined as the number of provider measure only slightly altered the correlation levels (from.01 to .03 differences).

Chapter 5

Discussion

In this study I attempted to increase understanding of child care stability by analyzing the child care stability literature and using the four major stability measures that have emerged in the literature on a single data set, 4 years of Oregon subsidy data. By using all four measures on a single data set, I was able to compare findings produced by each measure and to examine correlations in order to assess the extent to which each measure was describing the same phenomenon. I began with an analysis of what is currently known about child care stability.

Current Knowledge about Child Care Stability

Both quantitative and qualitative researchers have studied child care stability for over 30 years. Yet, we have limited knowledge of how stable child care arrangements are, or of what effect child care stability has on child or family outcomes. Our current state of knowledge is partially due to complexity of the phenomenon we study, but it is also due to the absence of comparability in methods used to measure stability.

The complexity of the phenomenon we attempt to describe continues to challenge researchers. Stability describes the time dimension of a relationship between a child and a provider. Change in caregivers is at the heart of stability, but it is not clear which changes impact development and family life. Context matters.

Change Does Not Equal Instability

Not all change represents instability. Change designed to meet a child's developmental needs may be positive. The goal is to have an arrangement last as

long as intended. Lowe and colleagues (2003) introduced the concept of unpredictability as a differentiator of change. When parents can plan a change to meet child and family needs, it is likely to have different impacts than change that is unplanned, precipitated by loss of employment, a child care subsidy, or a caregiver.

Threshold Level of Child Care Arrangement Stability and Age

Currently, there is no basis for positing a certain stability level as optimal at any age, but as we move toward identifying threshold levels, child age must be considered. Effects of stability are likely to vary depending on age of child; change for an infant is likely to have different effects than the same amount of change for an older child. Children typically increase the number of adults with whom they have relationships as they age.

Although it is likely that there is already consensus that high levels of instability threaten a child's development or family well-being, we have no empirical basis for establishing a threshold level to use as a standard for comparison.

Multiple Arrangements

Researchers are conflicted in how to think about multiple arrangements. Having more than one arrangement at the same time requires children to relate to multiple caregivers, yet it is not clear the extent to which they threaten children's ongoing relationships or attachments. Parents appear to use parental and relative care as supplements to a nonparental arrangement (Folk & Yi, 1994, Hofferth et al, 1991, Presser, 2003). Use of multiple arrangements appears related to use of center

care, indicating that parents are making a center option work by wrapping home-based arrangements around hours the center is in operation (Floge, 1985, Hofferth & Collins, 1998).

Employment appears to be a major factor in use of multiple arrangements. Use of multiple arrangements is highest when parents work nonstandard or rotating shifts (Han, 2004; Presser, 2003). It appears to be positively related to employment outcomes (Floge, 1985, Hoffeth & Collins, 2000). Low-income parents, who are the most likely to work nonstandard and rotating shifts, may have no choice but to use multiple arrangements.

Much more sensitive treatment of the impact of multiple arrangements is needed. Studies that control for factors commonly associated with the use of multiple arrangements, such as relationships of child and caregiver, reason for multiple arrangements, work schedule, and household income, are needed in order to identify effects of concurrent multiple arrangements on children and families.

Parental and Close Relative Care

Consensus on how to think of parental care in stability analysis has not emerged. Parents of young children appear to move in and out of employment and movement in child care arrangements typically accompanies employment moves (Blau & Robins, 1991a, 1991b, 1998, Hofferth & Collins, 2000, NICHD ECRN, 2004). Since it is likely that a move to parental care does not have the same impact as a move to nonparental care, it seems that stability measures need to differentiate parental care and transitions to parental care from other arrangements. Measuring parental care and transitions to parental care separately will give a more precise

picture of the child's experience and will allow for comparisons with studies that analyze only nonparental care arrangements. Care by grandparents and other close relatives raises similar issues in the context of stability measurement and separate treatment may be warranted.

The Special Case of Center Care Arrangements

Interest in stability is based on theory and on empirical findings of the centrality of the child-caregiver relationship to development. For most types of care there is typically one caregiver; most home-based care involves one caregiver and one or more children. In the case of most home-based care, the four stability measures describe change in a child-caregiver relationship.

In centers, where children have multiple caregivers, stability measurement needs to capture change within and between days as well as over longer periods of time. One can argue that a child experiences a certain level of stability by being cared for in the same facility, but that tells us little about the child's ability to maintain an ongoing relationship with a caregiver. With over a quarter of American children in center care, it is clear that methods for measuring stability in centers are needed. Measurement strategies such as the *Leiden Inventory for Daily Stability in Center Care* (De Schipper, Tavecchio, Van Ijzendoorn, & Van Zeijl, 2004) capture a child's experience of stability when there are multiple caregivers.

Given the complexity of the phenomenon we are attempting to describe, it is not surprising that we lack a theoretical or empirical basis for defining a level of stability that optimally supports development or family well-being.

Methodological Issues in Child Care Stability Measurement

Despite the conceptual challenges, four quantitative measures of child care arrangement stability have emerged in the literature, but results from studies using the four measures are not comparable because there has been no accompanying consensus on methodology.

Data Set

Typically, data sets that researchers use to analyze child care stability had been created for another purpose. National survey data sets that include child care variables have been used, as have program evaluation and administrative data sets. Completeness and accuracy are common issues. Complete information may not have been collected on all arrangements for all children in all relevant time periods. The number of hours in each arrangement may not be collected. Accuracy is an issue when parents are asked to recall data on arrangements in the past. The more distant the interview is from the time being reported, the more likely recall error will affect both completeness and accuracy.

Use of administrative data brings its own set of issues. If a variable is not needed to manage a program, input error or missing values are likely. Only the time the person is in the program is observed, so arrangements outside the program, or in times when the child is not enrolled in the program, will be missing. Most researchers have to adapt measures to fit available data.

Data Requirements

Survival or event history analysis has specific data set requirements, a person-period data set. A person-period data set includes a line of data for each

time period that a person is observed and left censoring issues need to be addressed. Transition measures have the least stringent data requirements as the measure can be as simple as assessing whether or not a child is in the same arrangement at specific points in time, for example, at 1 year. Considerably more data need to be captured in a data set in order to use any measure with more than the primary arrangement, as data are then required on multiple arrangements.

Level. Depending on the purpose of the research, researchers have done their analyses at the level of the family, the mother, or the child. Comparability of findings from analyses done at different levels is problematic. It is easiest to conceptualize arrangements at the child level.

At the mother level, one may be dealing with multiple arrangements for multiple children. If the outcome of interest is at the mother level, e.g., maternal employment, a maternal level of analysis may be appropriate but it introduces its own challenges.

One or all children. To simplify the conceptualization and analysis, researchers often select the youngest or a randomly selected focal child. They either don't collect data on other children in the family or drop data that have been collected. Evidence, from both child care and foster care research, that limiting to one child per family affects results, challenges that decision. In making this decision, there are issues of feasibility and data availability, but also issues that will affect representativeness of findings. The ability to generalize to a population of interest needs to be considered. It appears that families with multiple children make different child care choices than do single-child households, and that child

care usage varies by age of child. If the study purpose is to increase understanding of child care arrangement stability, inclusion of all children in a family seems appropriate. If the study purpose is to increase understanding of maternal behavior, then it is important to deal with differences in arrangements due to number of children in the family.

Arrangement. Researchers report on primary or all arrangements. Findings differ based on this decision. Given issues about multiple, concurrent arrangements, it seems important that a primary provider in each time period be identified in cases in which all arrangements are included. Further, it seems most appropriate to do separate analyses for primary and secondary arrangements.

Type of care. No consensus has emerged on how to classify types of care when measuring stability and this impacts comparability in findings. Most important is the decision about how to treat maternal and paternal care that was discussed above, as the decision impacts level of stability found. At a minimum, separate analyses of parental and nonparental arrangement stability will increase understanding of the child's experience.

Time unit for reporting findings. Stability is about change over time, so findings vary depending on the amount of time observed. One year is the most common time unit reported. When other time units are used, it reduces comparability of findings. It is desirable to report stability levels at 1 year even if additional time periods are reported.

Relationship of Four Stability Measures

Three of the 4 measures are highly correlated and two of them are very highly correlated, number of providers and transition. The transition variable measures the percentage of months that a child does not experience a change in providers. It is easier to understand the meaning of the transition measure when it is reported as the percentage of children who remained with the same provider (those children with a transition variable value of 1), or as the percentage of children who changed providers at least once (had a transition variable value of less than 1). I believe that the transition measure, reported as percentage of children who remained with the same provider or who changed providers at least once, increases understanding of stability, even though it is closely related to the number of providers measure.

Time is even more central in the calculation of the prime primary provider ratio (PPPR). Created to identify the presence of a consistent provider within a set of providers, the PPPR is a ratio of time with the provider that gave the most months of care to total time observed. The reported ratio represents the percentage of total observed months that the child spent with the prime primary provider. Like the transition measure, it describes percentage of time with a provider, but by differentiating between primary and prime primary providers, the PPPR provides additional information. It is not as highly correlated with the number of providers or transition measures as those two measures are with each other.

Arrangement duration measures a unique characteristic of stability, time in arrangement. A major difference between duration and the other three measures is

the unit of analysis, the arrangement rather than the child. Time in arrangement is the measure. The information that the duration measure adds to the understanding of stability in subsidized child care arrangements in Oregon is striking. Finding that half of arrangement spells ended before 4 months, even for children who had been in subsidized care for 3 years, added substantively to what had been learned about subsidized arrangement stability from the other 3 measures.

It appears that the 3 child-level stability measures are describing the same construct. Yet, each adds different information. Number of providers over a period of time is straightforward, as is number of months in an arrangement spell. Thinking in terms of spells makes duration somewhat more complicated. The meaning of the transition measure itself is difficult to communicate, although when the measure is reported as the percentage of children who remain with the same provider over a period of time, it is easily understood. The PPPR itself is the most difficult measure to understand, but like the transition measure it can be easily translated. The PPPR is simply the percentage of all observed months that the child spent with the most consistent provider. The fourth measure, duration of an arrangement, appears to capture a different and substantively important aspect of stability.

A critical question, which this study cannot address, is whether any of the four measures is better than the others at predicting child or family outcomes.

Stability of Oregon Subsidized Child Care Arrangements

Without a threshold level of stability with which to evaluate how stable Oregon's child care arrangements are, I compare findings on the four stability

measures with findings from other studies, noting differences when relevant. In the part of this section that follows the discussion of multiple arrangements, I use findings for a 12 month period, as 12 months is the most commonly used time period in studies of child care stability. Results reported in Chapter 4 were for the 11 time periods I used in the analysis. Restricting the discussion to 12 month findings facilitates comparisons with results from other studies. I use 12 month findings throughout the remainder of this chapter.

Multiple Arrangements

About a quarter of children in subsidized arrangements were in multiple arrangements for at least 1 month. About 7% of observed months involved two arrangements. The majority of these combinations involved two different family child care providers. About one fifth of these combinations involved both home-based and center care. I found limited evidence that families used two arrangements in order to use a center.

It is striking that families never combined care by one relative with that of another relative. Nor did they ever combine relative and in-home care. Qualitative research methods have the highest likelihood of explaining use of multiple arrangements.

Number of Providers

The number of primary providers for Oregon children observed in subsidized arrangements for a year ranged from 1 to 8 providers with a mean of 2.40 (*SD* 1.34). Of the children observed for the same time period, they had from 0 to 6 secondary providers with a mean of .48 (*SD* .79). When counting all

providers, whether primary or secondary, children had from 1 to 11 providers with a mean of 2.88 providers over the same time period.

There is no data with which we can easily compare this finding. Only a few studies used number of providers as a stability measure. NICHD Early Child Care Research Network (1997, 1999, 2001, 2003) reported the total number of providers for the children they had observed from birth. At 34 months they reported a range in the number of all providers of from 0 to 18 with a mean of 5.05 (SD 3.36). Youngblade (2003) only counted number of providers in the first year of a child's life. Oregon findings appear close to those found by NICHD.

At both 1 and 3 years, the range in the number of providers is striking. When considering the mean and standard deviation, it is clear that some children have few providers while other children are with a large number of providers.

Transition

By the time children had been observed in subsidized arrangements for 12 months, 30% remained with the same primary provider; 70% had changed primary providers at least once. Using nationally representative samples, Blau and Robins (1998) and Hofferth and colleagues (1991) found 52% and 56%, respectively, of children had remained in the same mode or arrangement in a year. With a sample of New York City mothers of young children, Floge (1985) found about 50% mothers using the same arrangements after 2 years. With a sample of welfare-involved families of preschool age children, Loeb and colleagues (2004) found 50% children in the same type of arrangement after 2 years. The Child Care Subsidy Dynamics Team (2002) found from 36% to 60% (in that study Oregon

was at 36% using data from 1997 to 1999) of children in subsidized arrangements to be with the same provider at 1 year.

Lowe and colleagues (2003), Meyers (1997), and Miller (2003) all examined transitions out of care in samples composed of participants in welfare programs. Lowe and colleagues found that 84% of families transitioned out of arrangements in 2 years. Meyers found 74% per year, and Miller found that 56% changed at least one type of care in 2 years. The finding that 70% of Oregon children in subsidized arrangements transitioned out of at least one arrangement is comparable to the level of transitions found in like populations.

Consistently, researchers who studied the transitions of low-income families who participated in assistance programs, found that these children were substantially less likely to be with the same provider after a year and, thus, more likely to have changed at least one arrangement.

Prime Primary Provider Ratio

The mean Prime Primary Provider Ratio (PPPR) for Oregon children in subsidized arrangements was .73 at one year; that is, 73% of observed months were with the primary provider that had provided the most months of care. The Child Care Subsidy Dynamics Team (2002) created this measure and is the only other user of it. The PPPR in the other four states ranged from .75 in Massachusetts to .88 in Texas. Analyzing Oregon subsidy data with a child age 0 to 12 randomly selected from each household over the two years 1997-1999, they found a PPPR of .77. With 4 years of data and a data set made up of all children

under age 5 in female-headed households, I found slightly less stability than did the earlier study.

Duration

The most surprising finding was that the median length of arrangement spells did not change as the number of months children were observed increased. Half of arrangement spells ended within 3 months for children observed up to 3 years. The median did not increase to 4 months until we had observed children for more than 3 years.

Less than a quarter of arrangements were resumed, so for over three fourths of arrangements the length of the first spell was the length of the arrangement. For children who had been observed for a year, 22% of arrangements were resumed after a break of one month or more and both first and second (in the few instances in which arrangements were resumed) spells, averaged 3 months. In a separate analysis, I found subsidy spell durations averaged 4 months. Therefore, children's arrangements, on average, were shorter than their subsidy spells.

The most comparable duration estimate in the literature is that of Emlen and colleagues (1972) who also found median durations of 3 months. Emlen and colleagues' sample was also of arrangements as they began. Reported durations of other researchers were based on samples of (a) arrangements that had ended, (b) arrangements that were continuing but whose beginning had not been observed, or (c) arrangements whose beginning and ending status could not be determined. All of those durations were longer but that would be expected due to sample differences.

Comparability in design and methods is needed in order to determine the length of arrangements for nationally representative and special population samples. Due to the issues already discussed in this study, comparison of stability findings is challenging. In terms of comparisons with findings from other studies, it appears that stability of Oregon children whose care is subsidized is lower than that of a nationally representative sample of children. But the findings appear to be similar to stability findings from studies done with similar populations. Increased comparability in methods is needed to increase confidence in this conclusion.

Comparison of Findings from the Four Stability Measures

Comparisons of findings from four measures using Oregon child care subsidy data make clear that, although three of the four measures are highly correlated, all four measures communicate different information about stability. Meaningfulness of the four measures varies. Finding that children averaged 2.79 primary providers over a year is difficult to interpret without some standard with which it can be compared. Finding that only 30% of children were with the same primary provider after a year communicates that stability may be a concern for these children even without a standard for comparison. The finding that 70% of children had experienced one or more changes in primary providers communicates the same message. The PPPR was designed to be more sensitive to the child's experience of stability by identifying percentage of observed time that the child remained with the primary provider that they had seen for the most months, and it did just that. Although only 30% of children had the same primary provider for the year, 73% of observed months in a year, on average, had been with the primary

provider that provided the most months of care. Finally, finding that half of arrangement spells lasted only 3 months, even for children who had been observed for 3 years, communicates that stability of care these children receive is a concern.

The individual stability measures appear to describe the experience of different sets of children, while, in fact, describing a single set of children. A closer look at the descriptive statistics helps explain the meaning of the four measures and why they provide such different descriptions of the level of stability experienced by these children. Distributions are heavily skewed; almost a third of children have the highest level of stability, value = 1. Wide differences in minimum and maximum values and large standard errors show a high level of variance in children's experience (see Table 14). The PPPR shows more variance than does the transition measure; both the range and standard deviation of PPPR values are larger than the same values for the transition measure. Those children whose stability measures were near the minimum (in the case of the transition and PPPR measures) or maximum (in the case of the number of providers measure) values experienced a high level of instability; up to 8 providers in a year, only 20% of months in which the primary provider did not change, and only 17% of months with the prime primary provider. Information provided by each of the measures adds to our understanding of the child's experience of stability in child care arrangements.

Table 14

Child–level Stability Values for Oregon Children Observed in Subsidized Arrangements for 12 Months

Variable	Min	Max	Mdn	M	SD	% of sample for whom measure value = 1[a]
No. Primary Providers	1.00	8.00	2.00	2.40	1.34	.30
Transition	.27	1.00	.91	.86	.14	.30
PPPR	.17	1.00	.75	.73	.24	.30

Note. n = 1,510 children observed for 12 months.[a] Value of 1 on all three measures describes the highest level of stability.

Chapter 6

Conclusion

Limitations

The analysis data set used in this study included all subsidized arrangements of Oregon preschool age children of female-headed households enrolled in the subsidy program between 1997 and 2001. It may not include all arrangements of these children. It is possible that while participating in the subsidy program families had arrangements that were not subsidized. A related limitation is that observed months were not continuous, by 1 year parents had up to 7 subsidy spells with a mean of 2.08 spells (*SD* 1.10). There was a break of at least 1 month between subsidy spells. We do not know if the child was in care during the unobserved months.

Finally, for the 17% of arrangements that were located in centers, we have no measure of the stability of the child's relationship with a particular caregiver. We were only able to measure the stability associated with being in that center.

Conclusions

What Is Known About Child Care Stability Measurement

Although child care stability has been studied for over 30 years, little is known about this important facet of child care arrangements, the time dimension of the relationship between child and provider. Variation in research purposes, measures, and methodologies have left us with limited knowledge of how stable child care is for a nationally representative group of children or for special populations. Although four quantitative measures have emerged, they have not

been used in consistent ways so as to produce comparable findings. We need accurate measures and consistently applied methods in order to estimate stability level and compare findings across studies and subpopulations.

It does not appear that the four measures are sensitive to the complexity of child care stability that both quantitative and qualitative researchers have described. Not all change is equal in its impact on the child and family. Predictable or planned change is more likely to be positive, whereas change caused by loss of job, provider, or child care subsidy is not. Similarly, change to a higher quality arrangement may be more supportive of development than stability in a poor quality one.

The impact of multiple arrangements is not easy to conceptualize since parents and close relatives are commonly part of the mix, and because these arrangements are commonly put together to enable the child to participate in a center program. At a minimum, researchers need to clearly differentiate primary and supplemental arrangements in the use of any stability measure.

The complexities inherent in the concept of child care stability include differences in the nature of the relationship of the child and the caregiver outside of the arrangement, as in the case of parents and other close relatives. Since concern about stability is based in concern that a child has time for developing a relationship with the caregiver, it would seem that parents and close relatives with whom the child is expected to have a lifetime relationship need to be treated differently than nonfamilial caregivers. Separate treatment of parental and relative care seems essential to understanding stability as the child experiences it.

Similarly, when a child returns to the same provider following a break, the impact would not likely be the same as if moving to a new nonparental arrangement.

The age of the child influences the effects of stability. It is likely that a child's need for stability in nonfamilial relationships decreases as the child ages so threshold levels would need to vary by age.

Children in center care are involved with multiple providers and hence, stability in center care is far more complex. With increasing percentages of young children in center care, it is important to continue development of tools to measure stability within centers.

To the extent possible, child care arrangement stability measures need to capture the complexity quantitative and qualitative researchers have described. To do this, more work on the measures is needed. Much can be done to increase confidence in findings and provide important information about levels of child care stability using the existing four measures.

Extent to Which the Four Measures Describe the Same Phenomenon

Use of the four measures with the same data set provides important information for stability studies. Using the same measures and methods with other data sets and testing correlations will increase confidence that the three child-level measures are highly correlated; that the high correlation levels were not an artifact of this data set.

Findings from this study indicate that all four measures add information about arrangement stability. The PPPR appears to more sensitively measure stability than does the transition measure, but data requirements are greater. The

number of providers measure is difficult to interpret without an established threshold level, but relatively easy to capture. The duration measure, done at the arrangement level, entails the most stringent data requirements but adds substantively to an understanding of stability.

Impacts of stability have been found for both children and parents, typically using a single stability measure. Using all four measures on a data set that includes child and family outcome measures would be a major contribution to our knowledge. The real test of the value of any of the four measures would be its ability to predict either child or parental outcomes.

Stability of Oregon Subsidized Child Care Arrangements

Oregon children in subsidized arrangements appear to have substantively less stable care than do children in nationally representative samples. However, their level of stability appears comparable with the levels found for other children of low-income families participating in assistance programs.

Recommendations

Six major recommendations for further research flow from this study:

1. The analysis using the three child-level stability measures should be done with additional data sets to confirm that the three measures describe the same construct, stability.
2. Stability researchers should work toward consensus on methodology for the four stability measures, apply these measures to additional data sets, including nationally representative data that supports analysis of stability

for children from low-income families. Comparison of findings would substantively increase knowledge of the level of stability experienced by children in low-income families who do and do not participate in public programs.

3. Researchers should conduct an ethnographic study of stability of a small subset of families from a sample of families whose child care arrangement stability is being measured by the four quantitative measures and use findings to increase understanding of arrangement stability and to further refine existing measures.
4. A team of stability researchers should explore adaptation of existing measures or creation of new measures to better capture the complexity inherent in child care stability.
5. Researchers should use the four stability measures in data sets that include child and family outcome data to test the ability of any or all of the measures to predict child and family outcomes.
6. Researchers should create and test a model that shows how child, family, and community factors are associated with levels of child care stability.

References

Adams, G., Snyder, K., & Sandfort, J. R. (2002). *Getting and retaining child care assistance: How policy and practice influence parents' experiences* (Occasional Paper No. 55). Washington, DC: The Urban Institute.

Allison, P. D. (1982). Discrete-time methods for the analysis of event histories. In S. Leinhardt (Ed.), *Sociological methodology* (pp. 61-98). San Francisco: Jossey-Bass.

Allison, P. D. (1995). *Survival analysis using the SAS system: A practical guide.* Cary, NC: SAS Institute Inc.

Barnas, M. V., & Cummings, E. M. (1994). Caregiver stability and toddlers' attachment-related behavior towards caregivers in day care. *Infant Behavior and Development, 17,* 141-147.

Blau, D. M., & Robins, P. K. (1991a). Turnover in child care arrangements. *The Review of Economics and Statistics, 73*(1), 152-157.

Blau, D. M., & Robins, P. K. (1991b). Child care demand and labor supply of young mothers over time. *Demography, 28*(3), 333-351.

Blau, D. M., & Robins, P. K. (1998). A dynamic analysis of turnover in employment and child care. *Demography, 35*(1), 83-96.

Casper, L. M., Hawkins, & O'Connell, M. (1994, May). *Who's minding the kids? Child care arrangements: Fall 1991* (U. S. Bureau of the Census, Current Population Reports No. P70-36). Washington, DC: U. S. Government Printing Office.

Child Care Subsidy Dynamics Study Team. (2002). *The dynamics of child care subsidy use: A collaborative study of five states.* NY: National Center for Children in Poverty.

Crockenberg, S., & Litman, C. (1991). Effects of maternal employment on maternal and two-year-old child behavior. *Child Development, 62,* 930-953.

Cummings, E. M. (1980). Caregiver stability and day care. *Developmental Psychology, 16,* 31-37.

De Schipper, J. C., Tavecchio, L. W. C., Van IJzendoorn, M. H., & Van Zeijl, J. (2004). Goodness-of fit in center day care: Relations of temperament, stability, and quality of care with the child's adjustment. *Early Childhood Research Quaterly, 19*(2), 257-272.

De Schipper, J. C., Van IJzendoorn, M. H., & Tavecchio, L. W. C. (2004). Stability in center day care: Relations of temperament, stbility, and quality of care with the child's adjustment. *Social Development, 13*(4), 531-550.

Emlen, A. C., Donoghue, B. A., & Clarkson, Q. D. (1972). *The stability of the family day care arrangement: A longitudinal study.* Corvallis, OR: A Continuing Education Book.

Emlen, A. C., Koren, P. E., & Schultze, K. H. (2000). *A packet of scales for measuring quality of child care from a parent's point of view* (Oregon Child Care Research Partnership). Portland, OR: Regional Research Institute, Portland State University.

Floge, L. (1985). The dynamics of child-care use and some implications for women's employment. *Journal of Marriage and the Family, 47*(1), 143-154.

Folk, K. F., & Yi, Y. (1994). Piecing together child care with multiple arrangements: Crazy quilt or preferred pattern for employed parents of preschool children? *Journal of Marriage and the Family, 56,* 669-680.

Guo, S., & Wlls, K. (2003). Research on timing of foster care outcomes: One methodological problem and approaches to its solution. *Social Service Review, 77*(1), 1-24.

Hamilton, C. E., & Howes, C. (1992). A comparison of young children's relationships with mothers and teachers. *New Directions for Child Development, 57,* 41-59.

Han, W.-J. (2004). Nonstandard work schedules and child care decisions: Evidence from the NICHD study of early child care. *Early Childhood Research Quarterly, 19*(2), 231-256.

Hofferth, S. L., Brayfield, A., Deich, S., & Holcomb, P. (1991). *National child care survey, 1990* (Urban Institute Report 91-5). Washington, DC: The Urban Institute Press.

Hofferth, S. L., Shauman, K. A., Henke, R. R., & West, J. (1998). *Characteristics of children's early car and education programs: Data from the 1995 National Household Education Survey* (NCES 98-128). Washington, DC: U. S. Department of Education, National Center for Education Statistics.

Hofferth, S. L., Shauman, K. A., & Henke, R. R. (1998). *Characteristics of children's early care and education programs: Data from the 1995 National Household Education Survey* (NCES 98-128). Washington, DC: U.S. Department of Education.

Hofferth, S. L., & Collins, N. (2000). Child care and employment turnover. *Population Research and Policy Review, 19,* 357-395.

Howes, C. (1988). Relationships between early child care and schooling. *Developmental Psychology, 24,* 53-57.

Howes, C., & Hamilton, C. (1992a). Children's relationships with caregivers: Mothers and child care teachers. *Child Development, 63,* 859-866.

Howes, C., & Hamilton, C. E. (1992b). Children's relationships with child care teachers: Stability and concordance with parental attachments. *Child Development, 63,* 867-868.

Howes, C., & Hamilton, C. E. (1993). The changing experience of child care: Changes in teachers and in teacher-child relationships and children's social competence with peers. *Early Childhood Research Quarterly, 8,* 15-32.

Howes, C., & Matheson, C. C. (1992). Contextual constraints on the concordance of mother-child and teacher-child relationships. *New Directions for Child Development, 57,* 26-40.

Howes, C., & Oldham, E. (2001). Processes in the formation of attachment relationships with alternative caregivers. In A. Goncu & E. L. Klein (Eds.), *Children in Play, Story, and School* (pp. 267-287). NY: The Guilford Press.

Howes, C., & Olenick, M. (1986). Family and child care influences on toddler compliance. *Child Development, 57,* 202-216.

Huston, A. C. (2002). Reforms and child development. *The Future of Children, 12*(1), 59-77.

Huston, A. C., Chang, Y. E., & Gennetian, L. (2002). Family and individual predictors of child care use by low-inocme families in different policy contexts. *Early Childhood Research Quarterly, 17,* 441-469.

Loeb, S., Fuller, B., Kagan, S. L., & Carrol, B. (2004). Child care in poor communities: Early leanring effects of type, quality, and stability. *Child Development, 75*(1), 47-65.

Loeb, S., Fuller, B., Kagan, S. L., & Carrol, B. (2004). Child care in poor communities: Early leanring effects of type, quality, and stability. *Child Development, 75*(1), 47-65.

Lowe, E. D., & Weisner, T. S. (2004). 'You have to push it, who's gonna raise your kids?': Situating child care and child care subsidy use in the daily routines of lower income families. *Children and Youth Services Review, 26*(2), 143-173.

Lowe, E. D., Weisner, T. S., & Geis, S. (April 2003). *Instability in child care: Ethnographic evidence from working poor families in the New Hope Intervention* (Working Paper Series No. 15). Washington DC: MDRC.

Meyers, M. K. (1997). Cracks in the seams: Durability of child care in JOBS welfare-to-work programs. *Journal of Family and Economic Issues, 18*(4), 379-406.

Miller, C. (2003, January). *Stability and change in child care and employment: Evidence from three states.* (Manpower Development Research Corporation, Working Paper).

Moss, P., & Brannen, J. (1987). Discontinuity in daycare arrangements for very young children. *Early Child Development and Care, 29,* 435-449.

NICHD Early Child Care Research Network. (1997). The effects of infant child care on infant-mother attachment security: Results of the NICHD study of early child care. *Child Development, 68*(5), 860-879.

NICHD Early Child Care Research Network. (1999). Child care and mother-child interaction in the first 3 years of life. *Developmental Psychology, 35*(6), 1399-1413.

NICHD Early Care Child Care Research Network. (2001). Child care and family predictors of preschool attachment and stability from infancy. *Developmental Psychology, 37*(6), 847-862.

NICHD Early Child Care Research Network. (2003). Does amount of time spent in child care predict socioemotional adjustment during the transtion to kindergarten. *Child Development, 74*(4), 976-1005.

Pianta, P. C., & Nimetz, S. L. (1991). Relationship between children and teachers: Associations with classroom and home behavior. *Journal of Applied Developmental Psychology, 12,* 379-393.

Pianta, R. C. (1992). Conceptual and methodological issues in research on relationships between children and nonparental adults. *New Directions for Child Development, 57,* 121-129.

Presser, H. B. (2003). *Working in a 24/7 economy: Challenges for American families.* NY: Russell Sage Foundation.

Raikes, H. (1993). Relationship duration in infant care: Time with a high ability teacher and infant-teacher attachment. *Early Childhood Research Quarterly, 8,* 309-325.

Rubenstein, J. L., & Howes, C. (1977). Caregiving and infant behavior in day care and homes. *Developmental Psychology, 15,* 1-24.

Rubenstein, J. L., & Pedersen, F. A. Y., L. J. (1977). What happens when mothers are away: A comparison of mothers and substitute caregivers. *Developmental Psychology, 13,* 529-530.

Scott, E., Hurst, A., & London, A. S. (2003). *Out of their hands: Patching together care for children when parents move from welfare to work* (Working Paper Series No. 16). NY: MDRC.

Singer, J. D., Fosburg, Goodson, B. D., & Smith, J. M. (1980). *National Day Care Home Study Research Report* (DHHS No. Publication No. (OHDS) 80-30283). Washington, DC: U.S. Department of Health and Human Services.

Singer, J. D., Willett. (2003). *Applied longitudinal analysis: Modeling change and event occurrence.* NY: Oxford University Press.

Singer, J. D., & Willett, J. B. (1994). Modeling duration and the timing of events. In S. L. Friedman & C. H. Haywood (Eds.), *Developmental follow-up* (pp. 315-330). San Diego, Ca: Academic Press.

Smith, K. (2002). *Who's minding the kids? Child care arrangements: Spring 1997* (Current Population Reports No. P70-86). Washington, DC: U. S. Census Bureau.

Tout, K., Zaslow, M., Papillo, A. R., & Vandivere, S. (2001, September). *Early care and education: Work support for families and developmental opportunity for young children* (Occasional Paper No. 51). Washington, DC: The Urban Institute.

Van IJzendoorn, M. H., Sagi, A., & Lambermon, M. W. E. (1992). The multiple caretaker paradox: Data from Holland and Israel. *New Directions for Child Development, 57,* 5-24.

Van IJzendoorn, M. H., Sagi, A., & Lambermon, M. W. E. (1992). The multiple caretaker paradox: Dataq from Holland and Israel. *New Directions for Child Development, 57,* 5-24.

Weber, R. B., & Davis, E. E. (2002). *Continuity and stability: Dynamics of child care subsidy use in Oregon.* NY: National Center for Children in Poverty.

Willett, J. B., & Singer, J. D. (1995). It's deja vu all over again: Using multiple-spell discrete-time survival analysis. *Journal of Educational and Behavioral Statistics, 20*(1), 41-67.

Wolf, D. A., & Sonenstein, F. L. (1991). Child-care use among welfare mothers: A dynamic analysis. *Journal of Family Issues, 12*(4), 519-536.

Youngblade, L. (2003). Peer and teacher ratings of third- and fourth-grade children's social behavior as a function of early maternal employment. *Journal of Child Psychology and Psychiatry, 44*(4), 447-488.

APPENDICES

Appendix A

Glossary of Child Care Stability Terms

Stability analysis requires careful use of terms. Following is a list of terms and how they are used in stability analysis:

Arrangement: the combination of an individual child and an individual provider. Months in a child care arrangement can be continuous or broken into spells.

Beginning: the time period in which an observation begins. In order to use survival analysis one must have a clearly identified beginning. In this study, the first month an arrangement or subsidy spell is observed is a beginning. Note that beginnings can happen in any of the observed calendar months depending on when the child entered the arrangement. Arrangement beginnings can occur over any of the 47 observed months.

Censored: observations or persons with unobserved event times. If the beginning of a spell is not observed, the observation is left censored. If the end of a spell is not observed the observation is right censored.

Event: an occurrence of interest. In this study an exit from a subsidy or an arrangement spell is an event of interest, and event time is number of months from beginning to event occurrence.

Period: a unit of time used in stability measures. It can be a minute, hour, day or longer. In this study a period is one month, the month in which a child care service was provided for a child.

Person-period data set: a data set with a line for each observed month for each person. The analysis data set has a separate line for each month that a child is observed.

Primary provider: the provider that provides the most hours of care to a child in a given month.

Prime primary provider: the provider that provides the most months of care to a child over all observed months. Care could be given continuously or in multiple spells. The Child Care Subsidy Dynamics Study Team created the concept of a prime primary provider. Because the Team had not needed a term to describe the provider that gave the most hours of care in a month, they used the term primary to describe the provider that provided the most months of care. In this study terminology was needed for both so I renamed the primary provider of the Dynamics Study Team the prime primary provider and used the term primary to describe the provider that provided the most hours of care in a month.

Provider: the facility that provides care for a child. It could be either a center or a home. In the case of a home, the provider and caregiver are almost always the same. In the case of a center, there are multiple caregivers associated with the one provider.

Secondary provider: the provider that provides the second highest number of hours of care to a child in a given month.

Spell: single transition into (or out of) one of series of repeatable events (Singer & Willett, 2003). In this study a spell is a period of continuous months. Arrangement spells are composed of continuous months with a provider. Subsidy spells are

composed of continuous months of subsidy receipt. For both subsidy and arrangements, a break of one month or more ends a spell.

Appendix B

Child Care Arrangement Stability Measure Studies Publication Date

First author & publication date	Purpose of study	Data set	Subjects	Measure(s)	Unit of analysis	Other
Emlen 1972	Dynamics of family child care arrangements	Study survey	Family child caregivers and mothers they served	Duration	Arrangement	
National Day Care Home Study 1980	Improve deliver of home-based care	Study survey	Family child caregivers and mothers they served	Duration	Arrangement	

Appendix B

Child Care Arrangement Stability Measure Studies Publication Date

First author & publication date	Purpose of study	Data set	Subjects	Measure(s)	Unit of analysis	Other
Floge 1985	Effects of child characteristics and child care on employment	Data from 3 interviews	Mothers and all children	Transition	Arrangement type	Relatives (father, hh rel, nonhh rel) Center Mother at work Other Combination of 2 Combination of 3 Combination of 4

Appendix B

Child Care Arrangement Stability Measure Studies Publication Date

First author & publication date	Purpose of study	Data set	Subjects	Measure(s)	Unit of analysis	Other
Moss 1987	Amount of discontinuity in day care of young children	Longitudinal data set created at London University	188 mothers who resumed full-time employment by time child 9 months	Transition Multiple arrangement	Child	

Appendix B

Child Care Arrangement Stability Measure Studies Publication Date

First author & publication date	Purpose of study	Data set	Subjects	Measure(s)	Unit of analysis	Other
Blau 1991a	Covariation among changes in child care, mother's employment, marital status, & fertility	Youth Cohort of NLYS, 1986 survey	Mothers and all children in first 3 years	Transition	Arrangement modes	In-home rel In-home nonrel Outside home rel Outside home nonrel

Appendix B

Child Care Arrangement Stability Measure Studies Publication Date

First author & publication date	Purpose of study	Data set	Subjects	Measure(s)	Unit of analysis	Other
Blau 1991b	Estimate a structural model of hh decisions concerning fertiflity, employment and child care	NLYS, 1982-1986 surveys	Mothers working or in school and youngest child	Transition	Arrangeemnt states	Relative Nonrelative
Hofferth 1991	Increase understanding of child care trends.	National Child Care Survey, 1990	Youngest child	Duration Transition Multiple arrangements	Arrangement	

Appendix B

Child Care Arrangement Stability Measure Studies Publication Date

First author & publication date	Purpose of study	Data set	Subjects	Measure(s)	Unit of analysis	Other
Wolf 1991	Effect of mother's perception of quality on probability of child care transitions	Sample of 84 AFDC mothers, 1983	Mother	Transition	Arrangement	
Folk 1994	Why families use multiple child care arrangements	NSFH, 1988	Mother and up to 2 children	Multiple arrangements	Arrangement	1 = multiple 0 = one type

Appendix B

Child Care Arrangement Stability Measure Studies Publication Date

First author & publication date	Purpose of study	Data set	Subjects	Measure(s)	Unit of analysis	Other
Meyers, 1997	Effects of episodic participation in employment preparation or paid work on durability of child care arrangements	356 GAIN (JOBS) participants 438 arrangement observation for 239 children and their parents	Mothers and youngest child	Transition	Arrangement	

Appendix B

Child Care Arrangement Stability Measure Studies Publication Date

First author & publication date	Purpose of study	Data set	Subjects	Measure(s)	Unit of analysis	Other
NICHD Early Child Care Research Network 1997, 1999, 2001, 2003	Extent to which mother child attachment is related to features of child care (1997, 1999, 2001). Effect of stability in first three years on socioemotional adjustment during transition to kindergarten(2003)	NICHD	Child	Number of providers	Arrangement	

Appendix B

Child Care Arrangement Stability Measure Studies Publication Date

First author & publication date	Purpose of study	Data set	Subjects	Measure(s)	Unit of analysis	Other
Blau 1998	Effects of household and market characteristics on child care turnover	NLYS 1982-1986 supplemented with CPS	Mothers and youngest child	Transition	Arrangement mode	Mother not employed Mother employed-unpaid care Mother employed-paid care
Hofferth 2000	Effect of child care instability on female employment	National Child Care Survey, 1990	Mothers with youngest child kindergarten or less	Transition	Arrangement	

Appendix B

Child Care Arrangement Stability Measure Studies Publication Date

First author & publication date	Purpose of study	Data set	Subjects	Measure(s)	Unit of analysis	Other
Child Care Subsidy Dynamics Team 2002	Explore child care subsidy program dynamics	Subsidy data 1997-1999 from IL, MA, MD, OR, & TX	All children and parents who participated in subsidy program	Primary provider ratio	Arrangement	

Appendix B

Child Care Arrangement Stability Measure Studies Publication Date

First author & publication date	Purpose of study	Data set	Subjects	Measure(s)	Unit of analysis	Other
Huston 2002	Individual and family difference of welfare single mothers that predict type of child care and subsidy usage	Data from New Hope,1994, New Chance,1989-1992, Minnesota Family Improvement Program, 1994-1998	One or two focal children	Duration	Arrangement	Formal care Nonrelative care Relative care

Appendix B

Child Care Arrangement Stability Measure Studies Publication Date

First author & publication date	Purpose of study	Data set	Subjects	Measure(s)	Unit of analysis	Other
Loeb 2003	How child care quality and stability affect development	Interview data, 1998-2000	451 families recruited during first visit to welfare office after TANF eligibility determined	Duration with current provider Multiple arrangements	Arrangement	No care Center care Family child care Kith and kin Moved to center Other

Appendix B

Child Care Arrangement Stability Measure Studies Publication Date

First author & publication date	Purpose of study	Data set	Subjects	Measure(s)	Unit of analysis	Other
Miller, 2003	Is unstable child care a reason that current and former welfare recipients leave jobs	Survey 3 to 4 years after program entry	Participants in CT Jobs First Program, FL Family Transition Program, and MN Family Investment Program	Transition	Continuous months in care regardless of changes in type or number of types per month	

Appendix B

Child Care Arrangement Stability Measure Studies Publication Date

First author & publication date	Purpose of study	Data set	Subjects	Measure(s)	Unit of analysis	Other
Presser 2003	Effects of 24/7 economy on children and families	Wave 1 National Household and Family Survey 1987-1988	Mothers	Multiple arrangements	Arrangement	

Appendix B

Child Care Arrangement Stability Measure Studies Publication Date

First author & publication date	Purpose of study	Data set	Subjects	Measure(s)	Unit of analysis	Other
Scott 2003	How women responded to work mandate of welfare reform and provided alternative care once in paid employment	Ethnographic data, 1997-2001	38 low-income mothers participating in Cleveland Project on Devolution and Urban Change		Arrangement	Causes of child care instability and multiple arrangements

Appendix B

Child Care Arrangement Stability Measure Studies Publication Date

First author & publication date	Purpose of study	Data set	Subjects	Measure(s)	Unit of analysis	Other
Youngblade 2003	Examine long-term effects of maternal employment during first year of child's life on social behavior of third- and fourth-grade children	Mother interview and teacher rating data	171 married mothers and their third- or fourth-grade child in a Midwestern city	Number of providers in child's first year of life	Arrangement	

Appendix B

Child Care Arrangement Stability Measure Studies Publication Date

First author & publication date	Purpose of study	Data set	Subjects	Measure(s)	Unit of analysis	Other
Han 2004	Effects of nonstandard work shifts on child care	NICHD-SECC	Children	Transition	Arrangement	Changes when related to changes in mother's work schedule preceding the change in arrangement.
Lowe 2004	Reasons for low and episodic use of child care subsidies	Child care data and Child and Family Survey, 1998	38 families in New Hope Project in Milwaukee, WI	Duration	Arrangement	

Appendix B

Child Care Arrangement Stability Measure Studies Publication Date

First author & publication date	Purpose of study	Data set	Subjects	Measure(s)	Unit of analysis	Other
Lowe 2004	Characteristics of families that affect child care stability	3 years of ethnographic data	44 families from last year of New Hope	Transition	Arrangement	Used 5 seasonal time periods

Appendix C

Analysis Sample

Missing Data

The merge of Department of Human Service (DHS) subsidy and Client Maintenance System (CMS) data sets resulted in missing data. I learned that DHS employees used different rules for dating activity in subsidy and CMS files, preventing a match of family CMS characteristics with the child and family file for months in which the payment month differed from the month in which the service was delivered. Subsidy records were dated as of the month the child care service was delivered and CMS records were dated as of the date the record was entered. I did a number of transformations of the month variable followed by repeated merges. This strategy reduced the number of missing values substantially.

Other values were missing because DHS employees had not entered values for some months. I determined the amount of variance over time on key variables that had missing values. If variance was less than 1%, I used a SAS procedure to replace the missing values. This left a very small number of missing values. The merged data set included 1,155,764 monthly observations on 100,764 unique children from 54,336 households and had few missing values.

Analysis Data Set

Left Censored

Inclusion of left censored arrangement spells (spells whose beginning was not observed) would skew stability findings as without a beginning date one cannot

estimate length or other characteristics of that spell. I therefore deleted all monthly observations of arrangement spells that were observed in October 1997, the first month in the data set. This left 880,474 monthly observations for 88,650 children in 48,456 households.

Female-headed Households.

Approximately 93% of households were headed by a female. Households headed by a male differed not only in gender of the head of household. They were usually two-parent households in which wages were still low enough for the family to qualify for the subsidy program, below 185% of the federal poverty level. Eligibility was limited to time a parent was not available to care for a child. To have been income eligible with two parents, it is likely that the family was dealing with barriers that kept one of the parents from either working or caring for the child.No data were available to identify these barriers. I limited the analysis data set to female-headed households. These females had care, custody, and control of the child whose care was subsidized. Although they may not have been the child's mother, they were acting in that role.

Children under Age 5

Stability of child care arrangements is developmentally of greatest concern for younger children. Selection of children under age 5 at first observed month captures most children prior to entry into public school when child care becomes a smaller part of most children's lives and child care stability is not likely to have as large an impact on development. Deletion of observations of children 5 years or older in the first observed month, and of children from male-headed households, resulted in an analysis

data set of 525,202 observed months for 48,862 children in 35,538 female-headed households.

Appendix D

Differences in Households Based on Number of Children

It was necessary to determine if households varied by number of children. If they did, then it was important to include all children in the analysis sample to insure that findings were representative of all child care arrangements. I first redid child and family descriptives by number of children in the household (Tables D1 and D2). To determine if families in the Oregon data set differed on these characteristics by the number of children in the household, I did an ANOVA with a data set containing the first observed month for each child. The results of the ANOVA (Table D3), using 3 categories of number of children (1 child, 2 children, and 3 or more children) and key descriptive variables, showed that there were significant differences between families by number of children on all characteristics. Using Tukey's post hoc analysis, I found that on some characteristics (mother's education, reason for subsidy, employment, TANF participation, and type of care) differences between two of the three groups were not significant.

Given that households and child care arrangements did vary significantly by number of children in the household (and in a separate, unreported analysis, by number of children on the subsidy program), and that arrangements were the focus of this study, I decided to include all children under 5 in the analysis data set. Inclusion of all children increased the likelihood that findings represent all subsidized arrangements of Oregon preschool-age children in female-headed households. In future studies, whose purpose is to predict levels of stability using household characteristics, this decision will have to be reviewed.

Table D1

Means and Standard Deviations of Key Child and Family Characteristics by Household Size

Characteristics	1 Child		2 Children		3 or more children	
	M	*SD*	*M*	*SD*	*M*	*SD*
Mother's years of education	11.13	1.86	11.16	1.92	10.95	2.22
Mother's age	24.16	6.53	25.49	5.42	27.39	5.09
Mother's language English[a]	.98	.14	.97	.16	.95	.21
Number of adults	1.06	.24	1.09	.28	1.13	.33
Oldest child (months)	21.78	16.36	53.58	25.65	87.94	31.00
Youngest child (months)	21.78	16.36	19.22	15.33	17.26	14.97
Employment status[b]	.48	.50	.53	.50	.54	.50
TANF status [c]	.38	.49	.35	.48	.36	.48

Note. $N = 48{,}862$ children. [a] Mother's language is English = 1, else 0. [b] Employed = 1, else 0. [c] Participating in TANF = 1, else 0.

Table D2

Frequencies of Key Child and Family Characteristics by Household Size

Characteristic	1 Child		2 Children		3 or more children	
	n	%	*n*	%	*n*	%
Program related to subsidy						
TANF single parent	8,119	43	7,065	39	4,524	41
TANF two parent	397	2	466	3	356	3
Employment Related CC	7,159	38	7,519	41	4,369	39
Medical	3,222	17	3,189	17	1,858	17
Type of care						
In-home	415	2	721	4	885	8
Relative	2,881	16	2907	16	2,159	20
Family child care	10,437	57	11,312	64	7,068	64
Center	4,513	25	2,695	15	934	8

Note: $N = 48{,}243$ children for program related to subsidy analysis. $N = 46{,}927$ children for type of care analysis

Table D3

One-Way Analyses of Variance for Differences in Child and Family Characteristics by Number of Children in the Household

Variable and source	*df*	*SS*	*MS*	*F*
Mother's years of education				
Between groups	2	296.29	148.14	37.94***
Error	38,972	152,174.10	3.90	
Mother's age				
Between groups	2	74,493.46	37,246.73	1,105.02***
Error	48,663	1,640,273.15	33.71	
Mother's language				
English[a]				
Between groups	2	5.97	2.98	108.51***
Within groups	48,859	1,343.55	.03	
Number of adults				
Between groups	2	33.60	16.80	215.53***
Error	48,240	3,759.58	.08	
Oldest child				
(months)				
Between groups	2	31,837,473.76	15,918,736.88	27,585.00***
Within groups	48,859	28,195,547.00	577.08	
Youngest child				

Table D3

One-Way Analyses of Variance for Differences in Child and Family Characteristics by Number of Children in the Household

Variable and source	*df*	*SS*	*MS*	*F*
(months)				
Between groups	2	154,369.97	77,184.98	314.95***
Error	48,859	11,974,091.28	245.07	
Employment status[b]				
Between groups	2	31.06	15.53	62.33***
Error	48,859	12,173	.25	
TANF status[c]				
Between groups	2	13.17	6.59	28.45***
Error	48,859	11,309.22	.23	
Program related to subsidy[d]				
Between groups	2	67.12	33.56	24.33***
Error	48,240	66,538.69	1.38	
Type of care[e]				
Between groups	2	461.06	230.53	59.95***
Error	46,924	1,804,450.72	3.85	

Note. $N = 48{,}862$ children. [a] Mother's language is English = 1, else 0. [b] Employed = 1, else 0. [c] Participating in TANF = 1, else 0. [d] Program in which parent is enrolled: 1 =

TANF single parent, 2 = TANF two parent, 3 = Employment Related Child Care, and 4 = Medical. [e] Type of care: 2 = family child care, 4 = in-home care, 5 = center, and 7 = relative care.

***$p < .001$

Appendix E

A Graphic Representation of Child Care Stability

The figure in Appendix E graphically describes child care arrangement stability for 10 children who were observed for 36 of the 47 months of subsidized child care in Oregon. On the far left, each child is identified by a number from 1 to 10. The first line for each child describes the months the child was observed in the subsidy program with a yellow bar. Subsidy spells are numbered. Below the subsidy line are separate lines for each observed child care arrangement. Each arrangement has its own color as well as its own line and a key on the bottom left describes the color code. Arrangement spells are numbered.

Values for the four child care arrangement stability measures are listed on the far right. The three child-level measures are on the first line for each child. Values for duration, the arrangement level measure, are listed on each arrangement line.

Left and right censoring are described. As you can see there are no observations in October 1997. All observations associated with an arrangement that was observed the first month in the data set were deleted, as that arrangement's beginning was not observed. I retained in the analysis data set only those arrangements whose beginning was observed; the arrangement was not in place in October 1997 and began in November 1997 or some later month. The last arrangement for each of the 10 children is right censored; we do not observe the end of that arrangement. When an arrangement spell is right censored we do not know its duration. Therefore, you will

see that for any first or second arrangement whose ending was not observed, there is a notation in the duration column "cens".

Legend

Subsidy Spell

Arrangement 2

Arrangement 10

A Graphic Represntation of Child Care Stability

Stability of Subsidized Child Care Arrangements of Children Observed for Three Years