There is growing concern worldwide about the impact of poverty, economic crisis, and stress on child development. In the United States, a shortage of low-cost housing combined with high poverty rates among families and the recent economic recession has produced a surge of homelessness among families with children. For the most recently reported school year available, 2010/2011, the U.S. Department of Education reported that more than a million students in American schools were identified as homeless. In addition, many other children not yet in school were living in emergency shelters for homeless families.

Children who are homeless or highly mobile are at high risk for learning and other problems when they go to school. Recent data from our analyses of academic achievement test scores in reading and mathematics from the Minneapolis Public Schools illustrates large achievement gaps between children who are living in poverty and more advantaged children. Children who come from poor families (defined as eligible for free lunch) have significantly lower test scores on average than children from more advantaged families. Children who have experienced homelessness have even lower scores on average than children qualified for free lunch. However, if we examine the scores of individual children over time, it becomes clear that there is tremendous variation in the academic success of impoverished or homeless children. A substantial proportion (close to half) of homeless children perform at the average or better level on standardized tests over repeated years of testing. These children show academic resilience in spite of their precarious life situations. What accounts for this resilience?

In our collaborative research, we have been investigating possible protective factors that

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might explain how some children from homeless families show resilience, both at home and at school. Our goal is to learn what works to protect children and promote resilience when risky life situations cannot be avoided. Ideally, it would be best to prevent homelessness in families as instability is not good for families or child development. However, in turbulent times, it is difficult for societies to prevent all of the known risk factors for child development, including homelessness. In this article we highlight findings from our basic research on resilience in homeless young children, and the interventions we have been developing to promote learning and positive child development in these very high risk families.

Risk and Resilience in Homeless Children

Over more than 20 years, our group and other investigators have documented the multiple risk factors observed in the lives of children who come to emergency shelters with their families. Risk factors include hunger, unsafe housing or neighborhoods, child maltreatment, domestic violence, parents with mental or physical health problems, and incarcerated parents. Many of the children are exposed to what is now called “toxic stress.” In other words, many of the children experience a high level of adverse life experiences, with the potential to have lasting effects on brain development due to the consequences of stress. Children with more risk factors generally show more problems, in health, achievement, mental health and behavior.

Nonetheless, there are many children and parents residing in emergency shelters who are managing to do well. These families appear to have more resources and protective factors in their lives. Our research indicates that preschool-aged children with more cognitive and self-control skills make a better transition to school. We are particularly interested in a set of cognitive skills called executive functions, because this set of self-regulation skills develop rapidly in the preschool years and they also show malleability. These skills can be learned and improved with practice. Our new intervention program targets these skills, as discussed further below.

Good parenting also appears to be a vitally important protective factor for homeless children. Our early research suggested that parent involvement in education was associated with better achievement in homeless children. Our recent studies indicate that effective parenting is particularly important when the risk level of the children is very high, consistent with a protective role.

We measure parenting in multiple ways, including systematic observation of parent-child interactions. On site in shelters, we video record parent-child dyads as they complete a set of structured tasks that were developed by the Oregon Social Learning Center and adapted for use with disadvantaged families initially by our Minnesota colleague, Professor Abigail Gewirtz. Some of the tasks are games they play together and other tasks are problem-solving discussions. Subsequently, the video recordings can be coded for parent or child behavior or the quality of their interaction. We have utilized three different coding strategies that produce similar evaluations of parenting quality: global ratings by an experienced clinical psychologist who works with families, state space grid methodology (SSG), and the observational coding system developed by...
investigators at the Oregon Social Learning Center and refined in collaboration with Professor Gewirtz and others, often utilized in intervention studies of the Parent Management Training – Oregon model (PMTO). All of these methods of coding the quality of parenting behavior show high reliability and agreement among methods. Good quality observed parenting relates to the child’s performance on cognitive measures and many other aspects of child behavior. One way “good parenting goes to school” appears to be indirect, through its effect on a child’s self-control and attention skills.

The Importance of Executive Function Skills for Learning in High-Risk Children

Executive functions (EF) refer to a broad set of cognitive control processes that make it possible for individuals to direct their attention, thinking, memory, and behavior to achieve adaptive goals. When children enter school, they must be able to follow directions, listen to the teacher, sit quietly, wait their turn, and in many other ways voluntarily control their own attention and behavior in order to learn. These top-down self-control skills develop rapidly during the preschool years as the brain develops and children practice self-control. Many early childhood games practice these skills, including memory games and playground games. In the game called “Simon Says” played by many American children, the child is told to imitate the leader only when “Simon says” – if an instruction is given without the phrase “Simon says” the child is supposed to suppress the urge to imitate the leader and instead do nothing. This game requires inhibitory self-control, one aspect of executive functions skills.

EF measures for children often resemble games, testing different components of EF. In the classic Peg Tapping task, the child is told to tap the pencil or peg once when the experimenter taps twice or to tap twice when the experimenter taps once. The child must suppress the habit of imitating the examiner to get a good score on this task. In another widely-used measure of EF, the Dimensional Change Card Sort, the child is told to sort by shape and then must switch to sorting by color instead of shape. In another task we have used, called Dinky Toys, the child must resist the temptation to grab a prize and tell the examiner in words which toy the child chooses as a prize. Other tasks require working memory, such as when a child is asked to repeat several numbers or words backwards. The child must remember the words and keep them in mind in order to repeat them backwards.

EF tasks can be scored with high reliability and composite scores can be created based on a set of these tasks. EF performance improves dramatically during the preschool years and continues to improve into adulthood. Many influences likely shape the development of EF skills, including the interplay of genes and experience, nutrition, parenting, and the quality of early childhood education. EF skills have been strongly linked to brain development and often involve the function of prefrontal neural circuits. Children who improve in EF show concomitant changes in neural function.

Considerable evidence links EF skills with school readiness and these skills appear to be particularly important for disadvantaged children. In our research with homeless children, we have found that EF skills assessed while children were staying in an emergency family shelter predicted how well children would do in school. Better EF skills predicted academic achievement but also getting along with the teacher, acceptance by other children, and behaving appropriately in the classroom. Scores on IQ tests also predict academic achievement, but EF measures predict other aspects of school adjustment better than general intellectual ability. A child’s ability for self-control appears to play a very important role in early school success. In addition, a growing literature indicates that EF skills also forecast long-term success in life.

The strong links of EF to school readiness and success inspired a number of investigators to test whether improving EF skills would boost school readiness. Evidence is growing to support
the value of interventions focused on building EF skills, particularly with preschool-aged children. Some of these efforts have studied the effects of specific preschool programs, such as “Tools of the Mind,” on EF skills. This preschool curriculum has a strong emphasis on EF skills. Other investigators have trained specific EF skills over a short time period to see if these skills can be taught. Early research is promising that EF skills can be improved through specific targeting. It was this malleability of EF skills that strongly attracted our group to focus on EF skills when we began to develop programs to boost the school readiness of homeless children living in shelters.

**Early Childhood Education at the People Serving People Shelter**

Beginning almost 10 years ago, a group of collaborators from the People Serving People organization serving homeless families, the University of Minnesota, and the Minneapolis Public Schools sat down together to consider what could be done to facilitate early childhood development and school readiness in young children coming through the People Serving People emergency shelter (PSP). This shelter has 99 emergency rooms and often houses over 300 people a night. Out of the 300+ guests, over half of them are children. Many of the children are very young and do not have access to quality childcare or preschool programs. The city had a number of good preschool programs but there often were no spaces available or the family did not have funding or transportation to seek them out. Working together, a team of researchers, early childhood educators, and staff from all the agencies involved developed a childcare program on site at PSP, the Early Childhood Development Program, which was subsequently licensed. This program has a strong commitment to quality, and recently was awarded a top-level four star rating of quality by the State of Minnesota Parent Aware rating system.

After the early childhood program was established, we continued to consider strategies for improving quality and boosting school readiness in children attending the programs. Given that the average stay for a family is 38 days, this task was a challenge. With support from a local family foundation and the University of Minnesota, we developed our first specialized program focused specifically on boosting EF skills for children about to transition from the shelter preschool to kindergarten. We called this program **Ready? Set. Go!**

**Ready? Set. Go!**

Our first version of the **Ready? Set. Go!** program (RSG) was implemented in August of 2010. We focused on a small group of children preparing to enter kindergarten, with the goal of improving school readiness, focused on EF skills training. The design team included preschool teachers, experts on EF and resilience from the University, shelter staff, and social workers from the local school district with years of experience working with homeless families and students. From the outset, there were three aspects of our intervention: preschool curriculum (classroom activities), individualized training for the children, and parent education emphasizing parent-child activities that could benefit EF development. The initial program was designed to take place in a single month, including pre- and post-program assessments. The intervention lasted three weeks.
Over time we have refined this program in numerous ways. We continued the special session for rising kindergartners (the month before they start kindergarten), but we also have developed a general program for any time of the year for 3- to 5-year old children in early child education programs. We applied for and were awarded a major grant from the U.S. Department of Education to refine this intervention and conduct a pilot test of its promise. We are currently completing the second year of this three-year grant, which has made it possible to refine and try out our intervention in three different preschool settings. The three settings include the preschool program at PSP, another preschool program for high-risk children in the community, and the laboratory school at the University, which trains many early childhood teachers. This coming year we will conduct a pilot study of the refined intervention. If all goes well, we would then prepare for a gold-standard efficacy trial, seeking additional grant support from the U.S. Department of Education.

Our design team is fully collaborative, including teachers and administrators from each site currently involved in the intervention development. Subgroups of the design team work on specific elements of the program, with ongoing consultation from additional community and university collaborators. Like many before us, we have learned that collaboration is challenging but well worth the investment of time and effort because in the long run the products of our work are both better and more practical.

Components of the Intervention

The RSG intervention has three components that were designed to be synergistic: (1) curriculum and teacher training to implement the curriculum; (2) individualized training for children; and (3) parent training to support EF learning in their children. In addition to the three components, we are developing and refining training methods for teachers, fidelity measures to assess implementation of the curriculum, and specific evaluation measures for parents and teachers to rate the program from their own perspectives. The full intervention includes pre-testing, teacher training, and three weeks of implementation, followed by post-testing and follow-up evaluations.

Each component of the intervention is designed to promote EF practice and, more specifically, to increase reflection processes theoretically linked to the development of EF skills. Our goal is to support and motivate the practice of reflection that results in growing capacity for cognitive reprocessing of information and better skills in management of attention, memory, and behavior to achieve goals.

In the curriculum component, our approach is to “train the teachers” and other staff who will implement the program with support from our team. We have developed a set of classroom activities and materials that teachers can use in small and larger group settings to encourage reflection and EF skills. Each activity has graduated levels so that the level of practice can be tailored to the EF skill level and developmental needs of children in the group.

For example, during an activity called “Mystery Animal,” children are shown a picture of an animal whose body is almost entirely hidden from view. Children are able to see a small part of the animal (the curve of a tail, a paw with claws, etc.) and asked to guess what animal is “hiding” based on the “clues” they are able to see. Teachers are coached to ask open-ended questions that encourage children to engage their EF skills as they predict what animal might be hiding. Children employ their working memory as they draw on their prior knowledge about animals to inform their predictions. They exercise their cognitive flexibility skills as they compare and contrast their answers with those of their peers, recognizing in the process that there is more than one way to interpret the visual clue they have been given. Children engage their inhibitory control skills as they take turns and practice participating in reciprocal conversations with their teachers and peers. To facilitate this process, teachers are
trained to guide the children’s conversations, encouraging the children to notice salient details of the animal’s bodies and asking prompting questions that allow children to reflect on their own thought processes as they compare and contrast their answers with those of their peers.

The individualized training component for children was designed to support children who are not ready for the group level of EF activities, usually due to struggles or delays in their development of EF skills. Individual practice activities have been developed to work one-on-one with a child, either in the classroom or in a separate area. A teacher or teacher’s aide would usually be trained in these strategies. These activities also have graduated levels of challenge and they are designed to be fun and also to prepare a child to do well in a small group EF activity in the classroom. All these activities are designed to be enjoyable for preschoolers.

The parent training component was designed around “family fun” meetings. These sessions include separate parent and child activities followed by interactive activities for families where parents practice the EF-boosting activities they have learned with their children. Each session, parents learn specific information about EF, brain development, and school readiness, plus activities to increase EF skills in young children. They learn about the importance of EF skills for school success, how to be an EF detective at home, catching their children and themselves using their EF skills, for example, to think flexibly, plan, pay attention, resist temptation, or wait. Parents learn card games, activities with books, and musical games that enhance EF skills. They also learn about the importance of family routines, sleep, and good nutrition for supporting EF development. Sessions are highly interactive so that parents observe video and live models, practice with each other, and provide their own examples. After the parent training portion, parents rejoin their children, and try out a new game or strategy they have learned. Family nights typically conclude with songs and musical activities that have been adapted to support reflection training, inhibitory control, and other specific EF skills. Any materials needed for parents to practice at home, including handouts, books and games, are provided. We have learned that it is beneficial for staff from the shelter (teachers and parent engagement coordinator) to participate in these family meetings because it creates a link between classroom and families that enhances their experience. This linkage ensures that parents receive consistent messages and support from shelter and research staff. Additionally, teachers working in the shelter are able to follow up with parents and reinforce the messages outside of the family meetings.

Early results of our intervention indicate improvements in EF task performance on multiple measures of EF in the children after three weeks of training, with at least short-term persistence of skills. Parents evaluate the program very favorably, as do teachers. The intervention appears to boost the level of EF activities in the classroom and skills of the teacher as an EF-instructor, as intended. However, it is too soon to know if this brief intervention can change the EF skills of homeless children in enduring ways that will carry forward as they move out of shelter.

**The Iterative Process**
The development of this intervention was shaped through an iterative process that was informed by developmental theory, empirical and field knowledge of homeless families and their issues, and the emerging science on executive function processes in relation to brain development and learning. Our objective is to promote resilience in a very high-risk group of children during a window of opportunity for school readiness, when there appears to be considerable brain plasticity for influencing EF skill development. We hope to generate a positive cascade over time, beginning with small improvements in EF skills that provide better odds for homeless and similarly disadvantaged children to get off to a good start in the beginning of school and building greater success over time. EF skills are fundamental to learning and we believe these skills are especially helpful for children faced with all the challenges associated with poverty and mobility.

At the same time our program aims to be practical, informed by the experience of teachers and staff on the “front lines” who know the context and the families involved. Our design team included all the key partners and in addition we held focus groups with teachers and parents for their input.

Each component of the program has been tested and refined in small-scale iterations of the intervention. For each iteration, we try to improve elements of curriculum or the assessments or the training. Soon we will be ready for pilot testing of the Ready? Set. Go! intervention as the next step toward the goal of a randomized controlled trial to test its efficacy. In the RSG program, we are striving for translational synergy, the development of an intervention that brings together the expertise of scientists and practitioners to create a program with potential to test resilience theory at the same time that it promotes positive child development in feasible and practical ways that appeal to key stakeholders. We believe that by working together from the outset, we can create better strategies that will be scientifically grounded, appealing, feasible, and truly make a difference in children’s lives.

**New Horizons**

The science on human stress and resilience is expanding rapidly and spreading across many fields. There is exciting new research on the neurobiology of resilience and the processes by which adverse life experiences may become biologically embedded to influence learning and health over the life course. There is growing interest in the possibility that some children are more sensitive to experiences, for better or for worse. The idea of sensitivity to experience is intriguing for intervention because it raises the possibility that children who are more sensitive to adversity and thus develop more problems, may also be more responsive to interventions. There also is much greater attention to cultural context in understanding and promoting resilience in individuals, families, and communities.

As the knowledge on resilience grows, we expect it will inform efforts to promote resilience in young children at risk due to homelessness and many other life adversities. The families that we work with in emergency shelters are concerned about the effects of stress on their children and in their own lives. They have encouraged us and inspired us to continue our efforts to reduce risk and promote success in their children and other children across the world in families confronted with economic crisis, stress, and mobility.

Clearly, homelessness is not good for families or human development, and should be prevented whenever possible. When it cannot be prevented, it is vital to protect children from the potential consequences of residential instability and promote both child and family resilience. High quality early childhood programs with an emphasis on executive function skills may play an important role in protecting children during times of difficulty and change for families.
Professor Masten has studied resilience for many years in diverse children and families who have faced significant adversities, including homelessness, war and disaster. She is Past-President of the Society for Research in Child Development and currently is a member of the Board on Children, Youth, and Families of the U. S. National Academies.

Ms. Kimball has a M. Ed. in Early Childhood Education and Early Childhood Special Education as well as a Minnesota teaching license for birth – grade 3. She began working at People Serving People five years ago as a Lead Preschool teacher and currently serves as the Educational Services Manager overseeing the Evening Education Program, Parent Engagement Program, and Early Childhood Development Program.

Ms. Lister has worked with preschool-aged children for six years in a variety of contexts. She has a Masters of Education in Early Childhood and Early Childhood Special Education and is currently a lead teacher at the Shirley G. Moore Laboratory School at the University of Minnesota.

Ms. Siedow has a Bachelor’s of Science in Urban Early Childhood Education and a Minnesota teaching license in birth-grade 3. She has taught for the past 3 years and currently is the Lead Preschool Teacher for ages 3-5 years at People Serving People.