American Red Cross
Training Services

Evaluation of Water Competency Skill Attainment for Young Children: An Expanded Assessment

Research conducted by the
American Red Cross

With financial and technical support from the
Centers for Disease Control and Prevention and
National Network of Public Health Institutes
September 30, 2022

Research Study Overview

- From December 2020 through July 2021, the American Red Cross conducted a 2-phase research study to examine:
  - Barriers to accessing swim lessons and water safety information among populations of children at higher risk of drowning (Phase 1).
  - Age groups in which young children may acquire unsupported swim skills by participating in developmentally appropriate group swim lessons (Phase 2). *Note: This phase of the study was conducted in communities with populations at higher risk for drowning.*
- The study was completed and technical reports for each phase were submitted in July 2021 to the National Network of Public Health Institutes (NNPHI) and the Centers for Disease Control and Prevention (CDC), titled as follows:
  - Barriers to Accessing Swim Lessons and Water Safety Information
  - Evaluating Water Competency Skill Attainment for Children
- Lessons learned from the 2020/21 study were applied to continue and scale the study in 2021/22.

Project Funding

This project is supported by the Centers for Disease Control and Prevention of the U.S. Department of Health and Human Services (HHS) as part of a financial assistance award (CDC-RFA-OT18-1802: Strengthening Public Health Systems and Services Through National Partnerships to Improve and Protect the Nation's Health) with 100 percent funding from CDC/HHS. The interpretations of contents and results are those of the author(s) and do not necessarily represent the official views of, nor an endorsement by, CDC/HHS or the U.S. Government.

Background

- Among young children, ages 1 to 4 years, drowning is the leading cause of fatal injuries in the United States (CDC, 2020).
- Research has indicated that an association exists between young children's participation in swimming lessons and a decreased risk of drowning deaths (Brenner, Taneja, Haynie, Trumble, Qian, et al., 2009).
- The American Academy of Pediatrics (AAP) recommended that children be "developmentally ready" for formal swimming lessons based not only the child's age, but on many "physical, social, behavioral, emotional, and cognitive skills balanced against the environmental risk of drowning" (Denny et al., 2021, p. 12).
- The AAP cited evidence (Denny et al., 2021) that children ages 2 to 4 can begin to acquire the motor skills needed for swimming, and that many children may be developmentally ready for swimming by 4.5 years of age.

Continued on next slide

Background *(Continued)*

- As in the previous 2021/22 study, central to this study was examining the acquisition of swim skills using the concept of water competency.
- This study focused on the water skills derived from the American Red Cross definition of water competency (Quan, et al., 2014), which includes the following:
  - Entry with total submersion
  - Recovery to the surface and remaining there for at least 1 minute using floating or treading
  - Change in body orientation to allow repositioning, turning at least 180° and facing toward an exit direction
  - Propulsion, including leveling off and moving on front and/or on back position for at least 25 yards/meters
  - Exit from the water to a position of safety
- Nine distinct skill components were further identified out of the above list to represent the full complement of this definition of water competency, which are described on slides 15 – 17.

Justification for Expanded Assessment

- Insufficient evidence exists related to the ages at which most young children (ages 1 to 5 years) may achieve unsupported swimming behaviors.

- A lack of evidence exists that evaluates swim lesson programs for young children that specifically examines the experience needed to acquire the skills that lead to water competence through the progressions of the program.

This study conducted by the Red Cross sought to scale and build upon the findings of the previous study as reported in the technical report titled “Evaluating Water Competency Skill Attainment for Children” to help fill these research and evidence gaps.

Significance

- The 2021/22 study evaluated a specific swim lesson education program for young children (ages 1 to 5 years) and examined recognized skills that lead to levels of water competence through the progressions of the program.
  - The selected skills are the full complement of water competence components aimed at gaining unsupported swimming behaviors.
  - The components of water competence describe different developmental levels of behavior. The beginning levels are supported behaviors (i.e., physically supported by a caregiver, instructor, shallow water or a flotation device) and more advanced levels are unsupported behaviors (i.e., no external physical support provided to perform the behavior).
- Caregivers also were surveyed pre- and post-intervention about their motivations and expectations related to enrolling their young children in swim lessons and their knowledge about water safety.

Research Purpose

- The two-fold purpose of this research was to determine 1) the impact of additional water experiences on the water competence of 1- to 5-year old children and 2) at what ages most young children may acquire unsupported swimming behaviors.
- This work was a continuation and scaling of the prior research project, *Evaluating Water Competency Skill Attainment in Children*, (technical report submitted in July 2021) that includes:
  - Assessing 9 water competency-based components.
  - Increasing the number of swim lessons each child received from 4 – 8 to 12 – 18.
  - Conducting the study in different states of the U.S. (El Centro, CA; Prince George's County, MD; and Atlanta, GA).
  - Surveying caregivers pre- and post-intervention about their motivations and expectations related to enrolling their young children in swim lessons and their knowledge about water safety.
- Outcomes from the study may impact the future design and delivery of swim instruction to young children.

Research Questions

1. To what extent does participation in repeated sessions of formal group swim lessons among 1- to 5-year-old children increase their achievement of water competence components?

2. At what age(s) did most children achieve levels of unsupported swimming behaviors across all water competence components among 1- to 5-year-old children after participating in formal group swim lessons?

3. What motivations, water safety knowledge and experiences of parents/caregivers of children between the ages of 1 and 5 years may be related to their participation in swim lessons?

Theoretical Framework

The studies (both 2020-2021 and 2021-2022) were designed using assumptions of a theoretical framework described as “developmental systems” theory (Ulrich, 2010) which include:

1. *Dynamic systems theory* (DST) (Newell, 1986; Thelen & Bates, 1994) that recognizes that changes in human behavior result from interactions (a.k.a., constraints) among personal characteristics, task demands, and environmental context.
2. *Developmental perspective* in which behavior change occurs in observable and predictable ordered progressions resulting from these natural constraints
3. The *water competence assessment* instrument that described ordered qualitative behavior changes within components.

Methodology

- Multi-lesson swim sessions (2 or 3 sessions) were conducted at three locations: Atlanta, GA; El Centro, CA; and Prince George's County, MD
- The chart below provides a snapshot of the programs and schedules that were offered:

	El Centro, CA	Atlanta, GA	Prince George's County, MD
Number of sessions offered	3	3	2
Number of lessons per session	6	6	8
Number of weeks for study	6	9	8
Total number of classes available	18	18	16
Offered Parent and Child Aquatics	Yes	Yes	Yes
Offered Preschool Aquatics	Yes	Yes	No

Continued on next slide

Methodology *(Continued)*

- Inclusion criteria were as follows: (1) a child aged 1 to 5 years; (2) informed consent from the parent or caregiver (hereafter referred to as caregiver); and (3) minimum attendance of 12* lessons.
- Participants were recruited through a combination of advertised course listings and local connections by program operators/aquatic managers.
- Participants received a deep discount on the cost of two or three sessions of swim lessons that were part of the study as an incentive.
- Parent and Child Aquatics (PCA) and/or Preschool Aquatics (PSA) levels of a swim lesson program were presented.
  - PCA is designed as an in-water caregiver-assisted experience for children ages 1- to about 3-years old focused on aquatic readiness/familiarization.
  - PSA is designed for children about 4- to 5-years old, without their caregiver in the water, focused on introducing basic swim skills.

**Note: The number of lessons per session typically range from 4 to 8 lessons.*

Continued on next slide

Methodology *(Continued)*

- Although ages are recommended in the course descriptions, caregivers self-selected either the PCA or PSA sessions in which to enroll their children.
- Swim skills performed by children 1- to 5-years old were assessed in a pre- and post-design by members of the research team using nine water competence components organized as intra-task developmental sequences.
- Certain swim sessions were video recorded to assess validity and reliability of the instrument, interpretation and future analysis.
- Caregivers were presented with pre- and post-participation surveys to collect basic demographics and:
  - Information about their child's access to water and past experiences with swim lessons.
  - Caregivers' motivations and expectations related to enrolling their child(ren) in swim lessons.
  - Caregivers' water safety knowledge.

Data Analysis

Data Collection

- For research questions 1 and 2, two methods were employed for assessing developmental steps within each component related to a series of swimming skills.
  - The primary mode of data collection was live observation by members of the research team on day one and then again on the final day of the study.
  - The secondary mode employed, for those individuals who were absent on either day one or the final day, relied upon video recordings from their first and/or last days of attendance.
- For research question 3, pre- and post-participation survey instruments were developed.
  - Caregivers were encouraged to complete the pre-participation survey online prior to the first swim lesson. Those who did not were asked to complete a paper survey upon arrival to the first swim lesson. Post-participation paper surveys were completed on the last day of swim lessons.

Continued on next slide

Data Analysis *(Continued)*

Water Competence Development Steps

- For research questions 1 and 2, each child's swimming behavior was assessed for nine separate developmental water competence components:
  - Water entry (WE)
  - Water exit (WX)
  - Breath control (BC)
  - Back float (BF)
  - Front float (FF)
  - Change in body orientation (CBO) (turning around while vertical)
  - Change in body position (CBP) (rolling over & vertical to horizontal)
  - Swimming on front (SF)
  - Swimming on back (SB)
- The assessment instrument used by researchers is described on the following two slides.

Continued on next slide

Data Analysis *(Continued)*

Explanation of the Assessment Instrument

Green represents the developmental step(s) identified as "Unsupported Behavior Demonstrated" within each component

Water Entry Component Sequence (WE)

1. No voluntary entry demonstrated
2. Adult- or flotation-supported feet-first entry
3. Unassisted voluntary feet-first entry

Water Exit Component Sequence (WX)

1. Caregiver-supported exit to pool side or position of safety
2. Flotation-supported or caregiver-assisted exit to pool side or position of safety
3. Independent exit to pool side or position of safety
4. Independent exit to pool side and exit from pool (over the side, up the stairs, ramp or ladder)

Breath Control Component Sequence (BC)

1. No voluntary submersion attempted
2. Voluntary partial facial submersion (i.e., mouth and/or nose)
3. Voluntary full face and/or head submersion
4. Repeated voluntary submersion/breath-holding
5. Extended (i.e., >3 sec.) voluntary breath holding and/or repeated rhythmic breathing with skill such as entry or flotation

Back (Supine) Buoyancy/Flotation Component Sequence (BF)

1. Back flotation with adult support or with flotation device support
2. Momentary (1-5 sec.) voluntary back flotation
3. Independent (>5 sec.) voluntary back flotation

Continued on next slide

Data Analysis *(Continued)*

Explanation of the Assessment Instrument

Green represents the step(s) of "Unsupported Behavior Demonstrated"

Front (Prone) Buoyancy/Flotation Component Sequence (FF)

1. Front flotation with adult support or with flotation device support
2. Momentary (1-3 sec.) voluntary front flotation
3. Independent (>3 sec.) voluntary front flotation

Change in Body Orientation (turning around while vertical) **Component Sequence (CBO)**

1. Voluntary change in body orientation while standing in water (i.e., touching bottom or side)
2. Flotation-device supported voluntary change in body orientation
3. Unsupported voluntary change in body orientation while in water

Change in Body Position (rolling over & vertical to horizontal) **Component Sequence (CBP)**

1. Adult supported body position change
2. Flotation-device supported voluntary change in body position
3. Unsupported voluntary change in body position

Swimming on Front Component Sequence (SF)

1. Adult-supported front gliding or paddling
2. Flotation device-supported front gliding, paddling or stroking
3. Unsupported front gliding or paddling for 2–3 body lengths
4. Unsupported front paddling or stroking for >3 body lengths
5. Unsupported front paddling or stroking for 25 yards

Swimming on Back Component Sequence (BF)

1. Adult-supported back gliding or paddling
2. Flotation device-supported back gliding, paddling or stroking
3. Unsupported back gliding or paddling for 3–4 body lengths
4. Unsupported back paddling or stroking for >4 body lengths
5. Unsupported back paddling or stroking for 25 yards

Data Analysis *(Continued)*

Research Question 3:

- Data cleaning and frequency analysis were performed.
- Results are presented by:
  - Caregiver responses combined across all age groups of children.
  - Major categories of questions:
    - Motivations for enrolling child(ren) in swim lessons
    - Issues of comfort level related to swim lessons for children
    - Caregivers' expectation of their learning of water safety versus actual
    - Caregiver water safety behaviors
    - Caregiver water safety knowledge

Data Summary – Participation

- Available sample size of 96 children and 60 caregivers (based on minimum and maximum class size allowable by program design)
- 71 children and an additional 36 caregivers were enrolled in lessons
- 52 children and 28 caregivers participated in at least 1 class
- 37 children with pre- and/or post-test data were included in the study
- 48 caregivers completed the pre-survey, 35 completed the post-surveys; of those, 27 caregivers completed both the pre- and post-surveys
  - The demographic data provided in this report is based on the responses of the 48 caregivers who completed the pre-survey
- An additional 11 children participated in 1 swim lesson for the recording of the training video and some caregivers served as beta testers for parent survey

Participant Profile: Swimming-Related

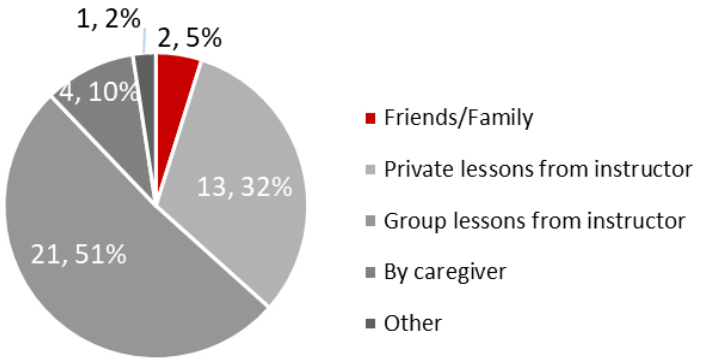
Caregiver Rating of Child's Swim Skill Level

Non-swimmer	42
Beginner swimmer	12
Intermediate swimmer	1
Total	**55**

Caregiver Report of Child's Prior Swim Lesson Experience

Yes	30
No	24
Total	**54**

Types of Lessons



Note: Respondents could select all that applied for Types of Lessons.

Participant Profile: Age and Gender Identity

Child's Age

Age	PCA (n=17)	PSA (n=20)
Mean	1.71 (0.666)	3.95 (1.05)
Median [Min, Max]	2.00 [1.00, 3.00]	4 [1.00, 5.00]

Child's Gender Identity

	N=55	
Female	22	40%
Male	32	58.2%
Prefer not to answer	1	1.8%

PCA – Parent and Child Aquatics
PSA – Preschool Aquatics

Note: Child's gender was reported by the caregivers who responded to the pre-participation survey which represented a total of 55 children. Child's age was limited to the children who met the inclusion criteria for skills analysis, which was a total of 37.

Participant Profile: Race and Ethnicity

Race

	Children (n= 54)		Caregivers (n=48)	
Black (or African-American)	28	50.9%	25	52.1%
White (or European-American)	14	25.5%	11	22.9%
American Indian or Alaska Native	3	5.5%	2	4.2%
Asian American, Native American or Pacific Islander	1	1.8%	1	2.1%
Other	2	3.6%	3	6.3%
Prefer not to answer	5	9.1%	4	8.3%
Did not answer*	2	3.6%	2	4.2%

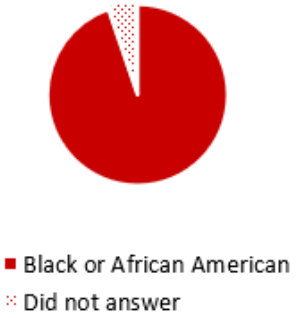
Identify as Hispanic or Latino

	Children (n=55)		Caregivers (n=48)	
Yes	21	38.2%	17	35.4%
No	33	60%	30	62.5%
Did not answer*	1	1.8%	1	2.1%

**Respondent did not answer the question*

Participant Profile: Race and Ethnicity of Children by Site

Atlanta, GA



El Centro, CA

PG County, MD

Hispanic

Hispanic

Hispanic

Participant Profile: Family Income

	Atlanta (n=16)	El Centro (n=17)	PG County (n=15)	Overall (n=48)
No income in 2021	0	0	6.7%	2.1%
Less than $15,000	0	5.9%	0	2.1%
$15,000 - $24,999	0	17.6%	0	6.3%
$25,000 - $34,999	0	17.6%	0	6.3%
$35,000 - $54,000	0	0	0	0
$55,000 - $74,999	6.3%	0	13.3%	6.3%
$75,000 - $99,999	6.3%	23.5%	26.7%	18.8%
$100,000 or more	87.5%	17.6%	33.3%	45.8%
Prefer not to answer	0	11.8%	20%	10.4%
Did not answer*	0	5.9%	0	2.1%

**Respondent did not answer the question*

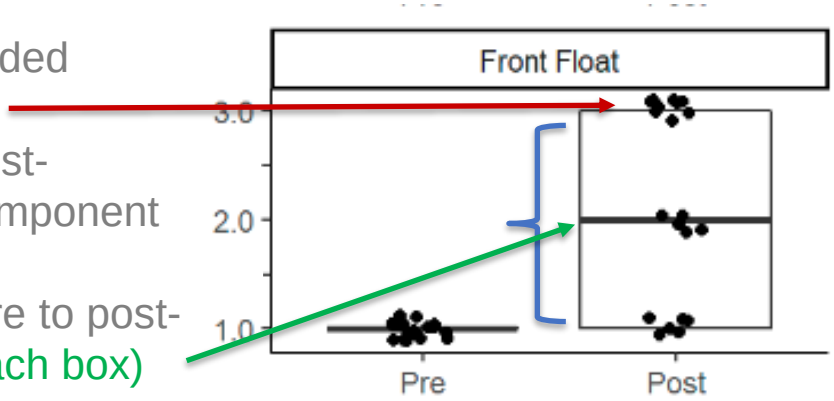
Participant Profile: Number of Participating Children per Family

	Atlanta (n=16)	El Centro (n=17)	PG County (n=15)	Overall (n=48)
1 child	81.3%	82.4%	93.3%	85.4%
2 children	18.8%	11.8%	6.7%	12.5%
3 children	0	5.9%	0	2.1%

**Respondent did not answer the question*

Research Question 1: Visualizing the Results

- The data visualization on slides 26 to 34 is broken out by each of the nine water competence components and shows:
  - Where most of the children started and ended (represented by dots)
  - The amount of variation of the pre- and post-test scores for each water competence component (represented by a box plot)
  - Whether the median increased from the pre to post-test (represented by the bold line within each box)

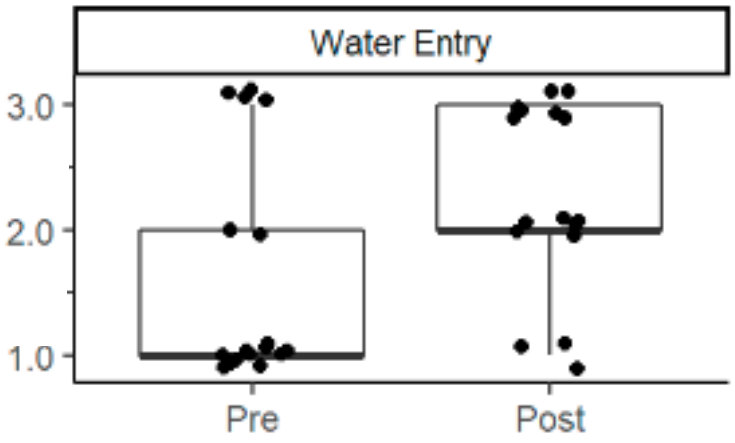


- On each slide, the chart on the right depicts the change in the n=20 children who participated in the PSA course.
- In this example, everyone started out with a score of 1. There was no variability in the pre-test because every child had the same score. However, the post-test score showed some variation in where children ended up. Some stayed the same, and some improved to differing degrees.

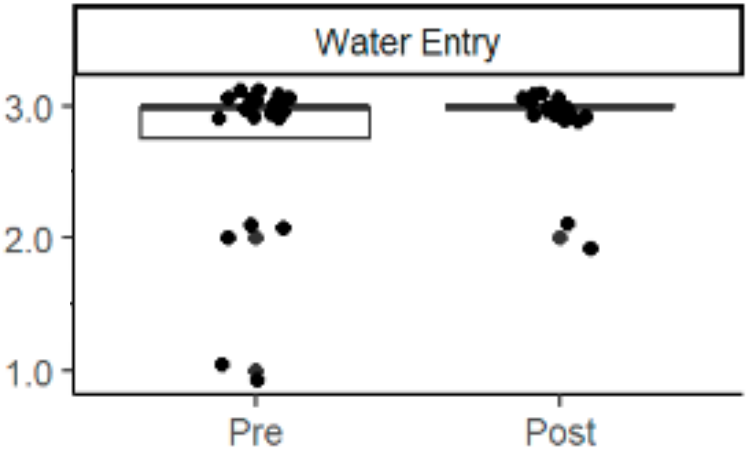
RQ1 Results: Water Entry

Overall Changes

PCA



PSA



Water Entry Component Sequence (WE)

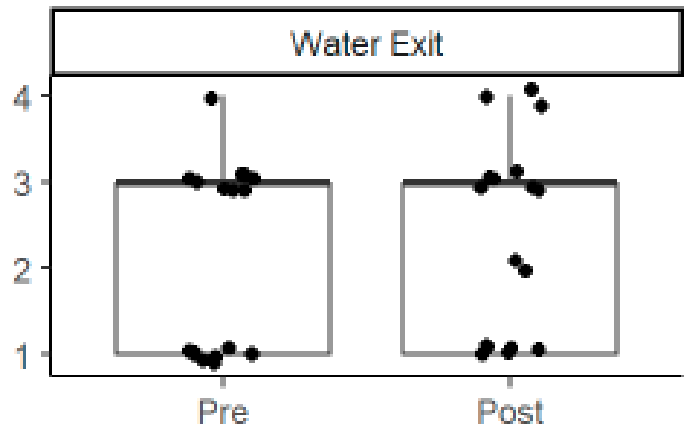
1. No voluntary entry demonstrated
2. Adult- or flotation-supported feet-first entry
3. Unassisted voluntary feet-first entry

Key Findings: Significant improvement observed among PCA from pre- to post-test; In PSA, "ceiling effect" prevented significant increase since most already at Level 3 at pre-test

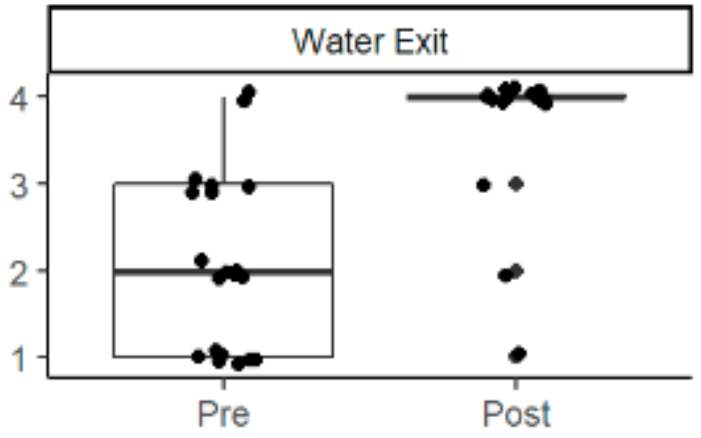
RQ1 Results: Water Exit

Overall Changes

PCA



PSA



Water Exit Component Sequence (WX)

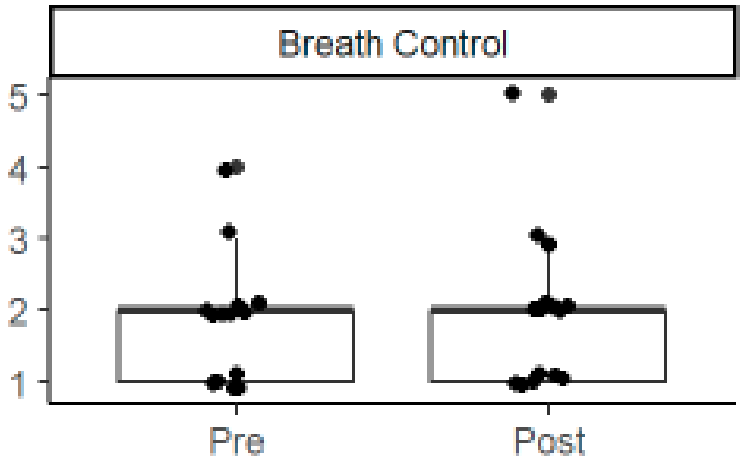
1. Caregiver-supported exit to pool side or position of safety
2. Flotation-supported or caregiver-assisted exit to pool side or position of safety
3. Independent exit to pool side or position of safety
4. Independent exit to pool side and exit from pool (over the side, up the stairs, ramp or ladder)

Key Findings: No significant improvement among PCA; significant improvement ($p<0.001$) among PSA

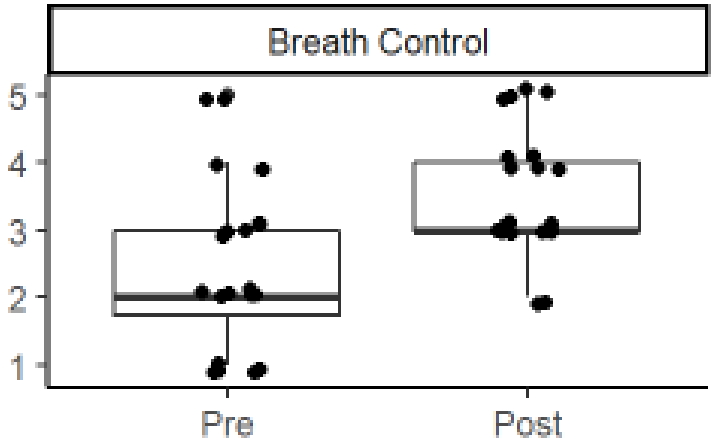
RQ1 Results: Breath Control

Overall Changes

PCA



PSA



Breath Control Component Sequence (BC)

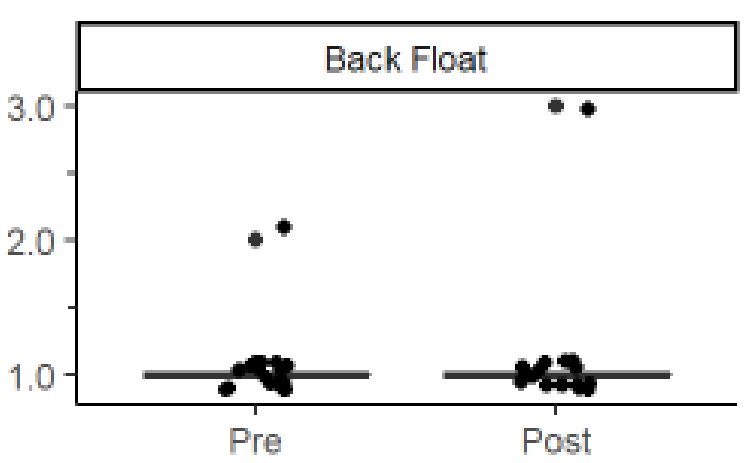
1. No voluntary submersion attempted
2. Voluntary partial facial submersion (i.e., mouth and/or nose)
3. Voluntary full face and/or head submersion
4. Repeated voluntary submersion/breath-holding
5. Extended (i.e., >3 sec.) voluntary breath holding and/or repeated rhythmic breathing with skill such as entry or flotation

Key Findings: No significant improvement among PCA; significant improvement ($p<0.0001$) among PSA

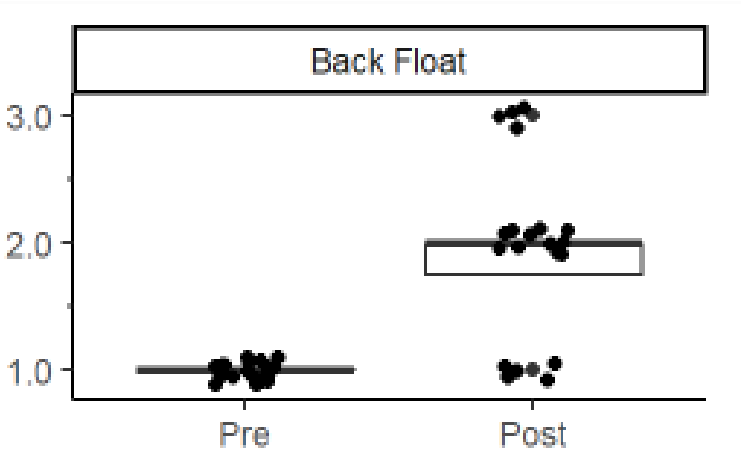
RQ1 Results: Back Flotation

Overall Changes

PCA



PSA



Back (Supine) Buoyancy/Flotation Component Sequence (BF)

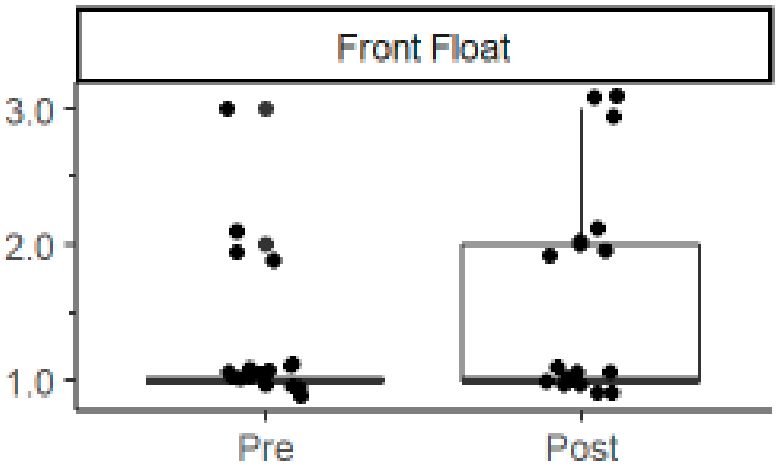
1. Back flotation with adult support or with flotation device support
2. Momentary (1-5 sec.) voluntary back flotation
3. Independent (>5 sec.) voluntary back flotation

Key Findings: No significant improvement among PCA; significant improvement ($p<0.001$) among PSA

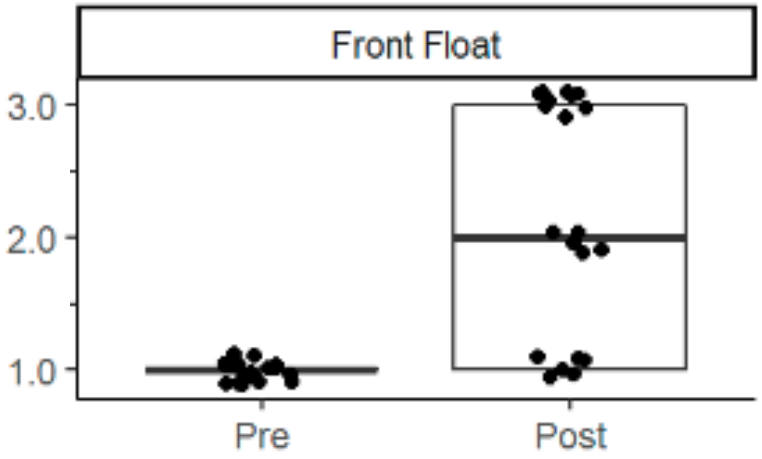
RQ1 Results: Front Flotation

Overall Changes

PCA



PSA



Front (Prone) Buoyancy/Flotation Component Sequence (FF)

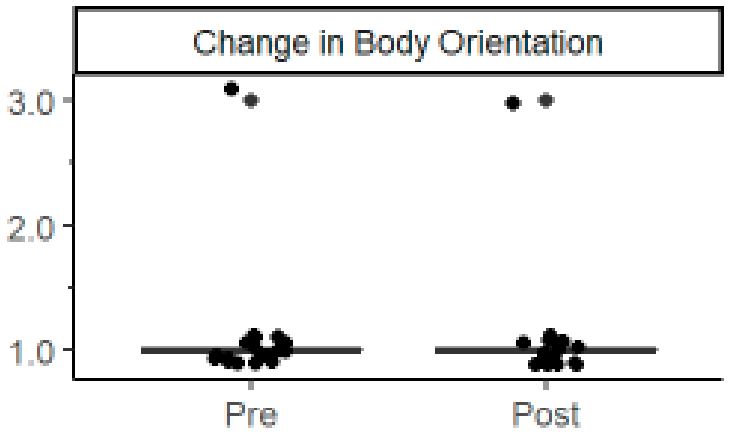
1. Front flotation with adult support or with flotation device support
2. Momentary (1-3 sec.) voluntary front flotation
3. Independent (>3 sec.) voluntary front flotation

Key Findings: No significant change among PCA; significant improvement ($p<0.001$) among PSA

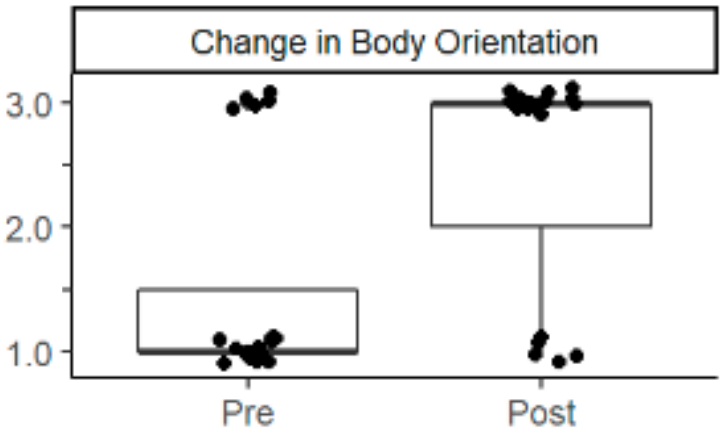
RQ1 Results: Change in Body Orientation

Overall Changes

PCA



PSA



Change in Body Orientation (turning around while vertical) **Component Sequence (CBO)**

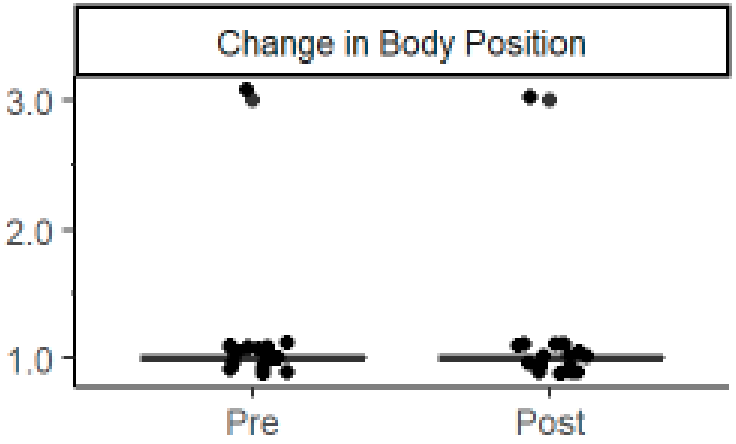
1. Voluntary change in body orientation while standing in water (i.e., touching bottom or side)
2. Flotation-device supported voluntary change in body orientation
3. Unsupported voluntary change in body orientation while in water

Key Findings: No significant change among PCA; significant improvement (p=0.002) among PSA

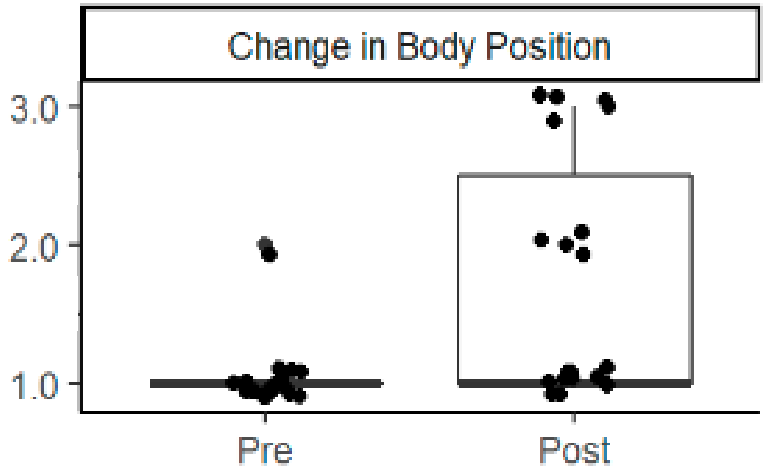
RQ1 Results: Change in Body Position

Overall Changes

PCA



PSA



Change in Body Position (rolling over & vertical to horizontal) **Component Sequence (CBP)**

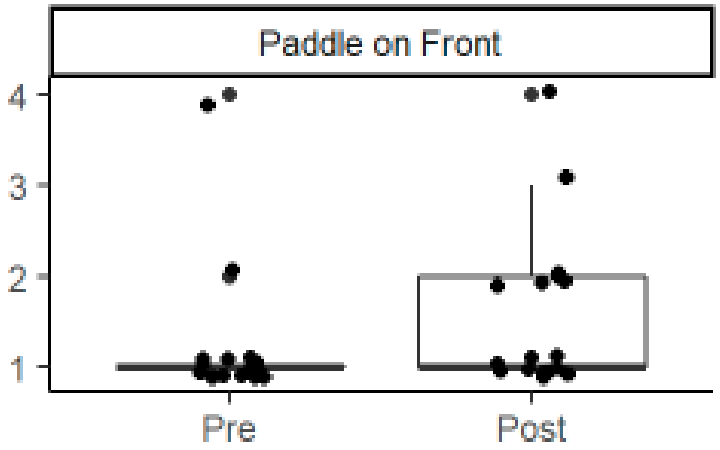
1. Adult supported body position change
2. Flotation-device supported voluntary change in body position
3. Unsupported voluntary change in body position

Key Findings: No significant change among PCA; significant improvement (p=0.007) among PSA

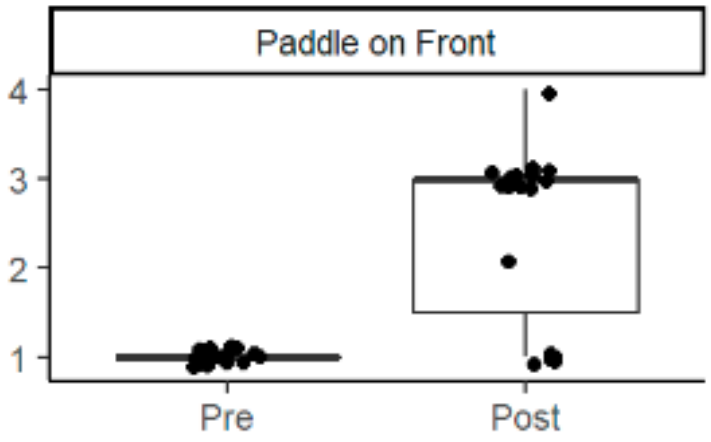
RQ1 Results: Swimming on Front

Overall Changes

PCA



PSA



Swimming on Front Component Sequence (SF)

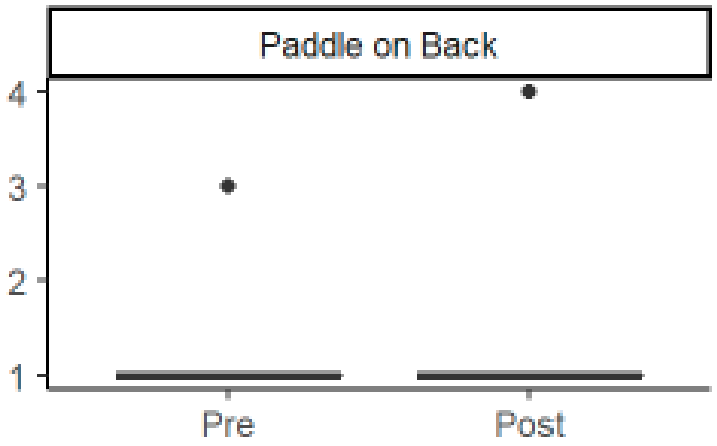
1. Adult-supported front gliding or paddling
2. Flotation device-supported front gliding, paddling or stroking
3. Unsupported front gliding or paddling for 2–3 body lengths
4. Unsupported front paddling or stroking for >3 body lengths
5. Unsupported front paddling or stroking for 25 yards

Key Findings: Significant improvement ($p=0.048$) among PCA; Significant improvement ($p<0.001$) among PSA.

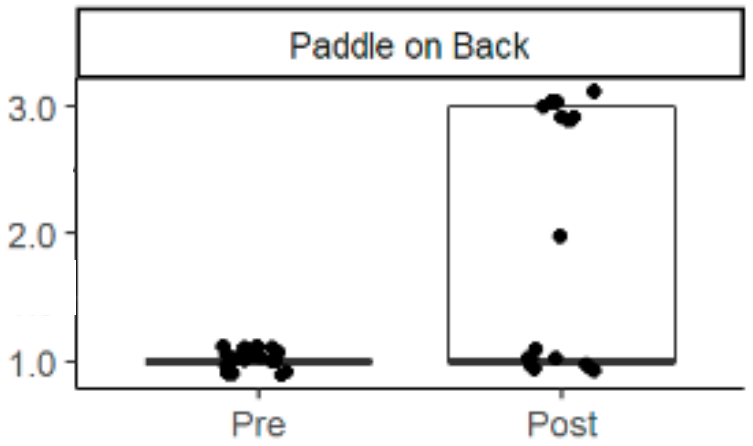
RQ1 Results: Swimming on Back

Overall Changes

PCA



PSA



Swimming on Back Component Sequence (BF)

1. Adult-supported back gliding or paddling
2. Flotation device-supported back gliding, paddling or stroking
3. Unsupported back gliding or paddling for 3–4 body lengths
4. Unsupported back paddling or stroking for >4 body lengths
5. Unsupported back paddling or stroking for 25 yards

Key Findings: No significant change among PCA; significant improvement (p=0.004) among PSA

Research Question 1: Results

To what extent does participation in repeated sessions of formal group swim lessons among 1- to 5-year-old children increase their achievement of water competence components?

- Little significant change was noted in the PCA group with two exceptions.
- Among the 17 children enrolled in PCA, only two water competence components showed statistically significant improvement from pre- to post-test assessments: water entry and swimming on front.
  - Water entry (p=0.012): 4 children improved one step while 4 improved two steps to unsupported behavior
  - Swimming on front (p=0.048): 4 children showed a one-step improvement (to Level 2) and 1 child improved 2 steps (to Level 3)
- The results for the PCA children provide a cautionary tale. Apparently, it is much easier for 1- to 3- year-olds to improve their water entry than it is for them to achieve any other water competence components. Caregivers enrolling children in the PCA classes must be warned and educated about how to:
  - Prevent a young child from entering the water when unsupervised.
  - Maintain constant and active supervision when in or near water.

PCA – Parent and Child Aquatics

Note: Analysis was not adjusted to control for experiementwise error rate.

Research Question 1: Results *(Continued)*

To what extent does participation in repeated sessions of formal group swim lessons among 1- to 5-year-old children increase their achievement of water competence components?

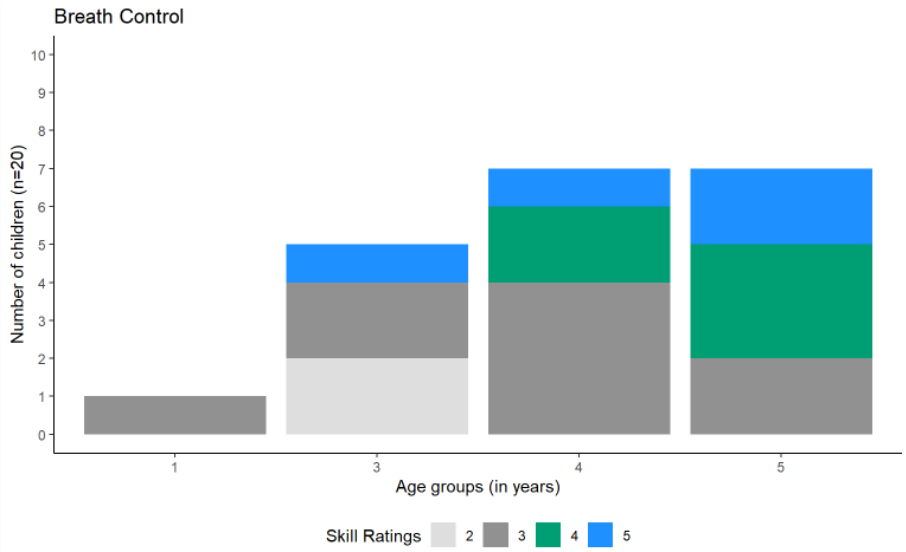
- A majority of the 20 children enrolled in PSA showed statistically significant improvements in eight of the nine water competence components from pre-test to post-test:
  - Water exit ($p<0.001$)
  - Back Float ($p<0.001$)
  - Change Body Orientation ($p=0.002$)
  - Swim on Front ($p<0.001$)
  - Breath Control ($p<0.001$)
  - Front Float ($p<0.001$)
  - Change in Body Position ($p=0.007$)
  - Swim on Back ($p=0.004$)).
- Water entry was the only water competence component that did not show a significant improvement among the 3- to 5-year-olds due to a "ceiling effect." In the pre-test assessment, most children already demonstrated unsupported water entry so further improvement was not possible.
- While many of the preschoolers saw significant improvement on one or more of the components, a majority did not demonstrate unsupported swimming behaviors in most water competence components.

PSA – Preschool Aquatics

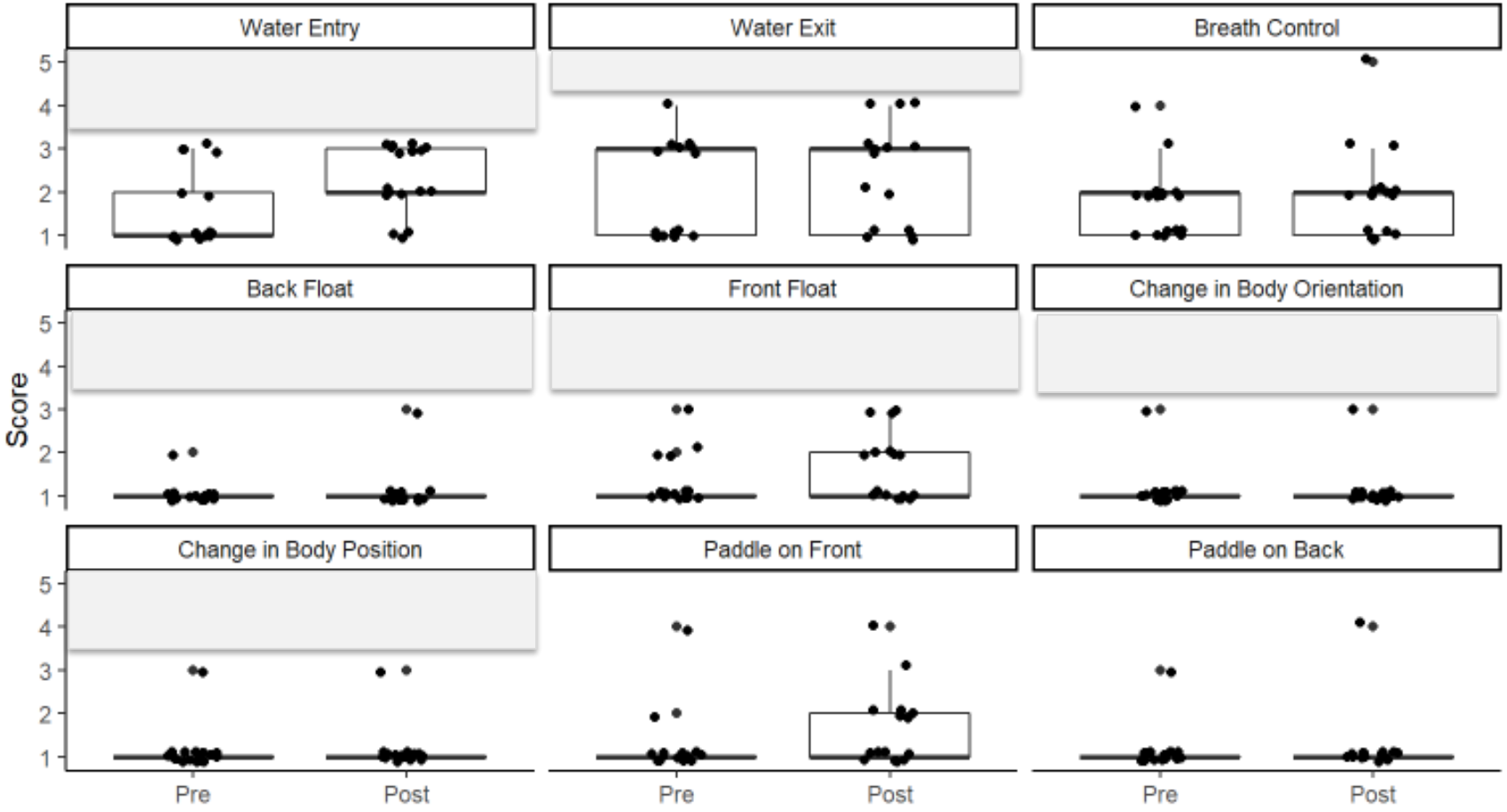
Note: Analysis was not adjusted to control for experiementwise error rate.

Research Question 2: Visualizing the Results

- The data visualization on slides 39 and 40 uses the same graphics as in the slides for research question 1 but provides an overall view of all nine water competence components by PCA and PSA.
- Slides 41 through 49 provide visualization of the level of change by age for each of the nine water competence components by PCA and PSA.
  - The bars represent the highest level of skill attainment by children by age.

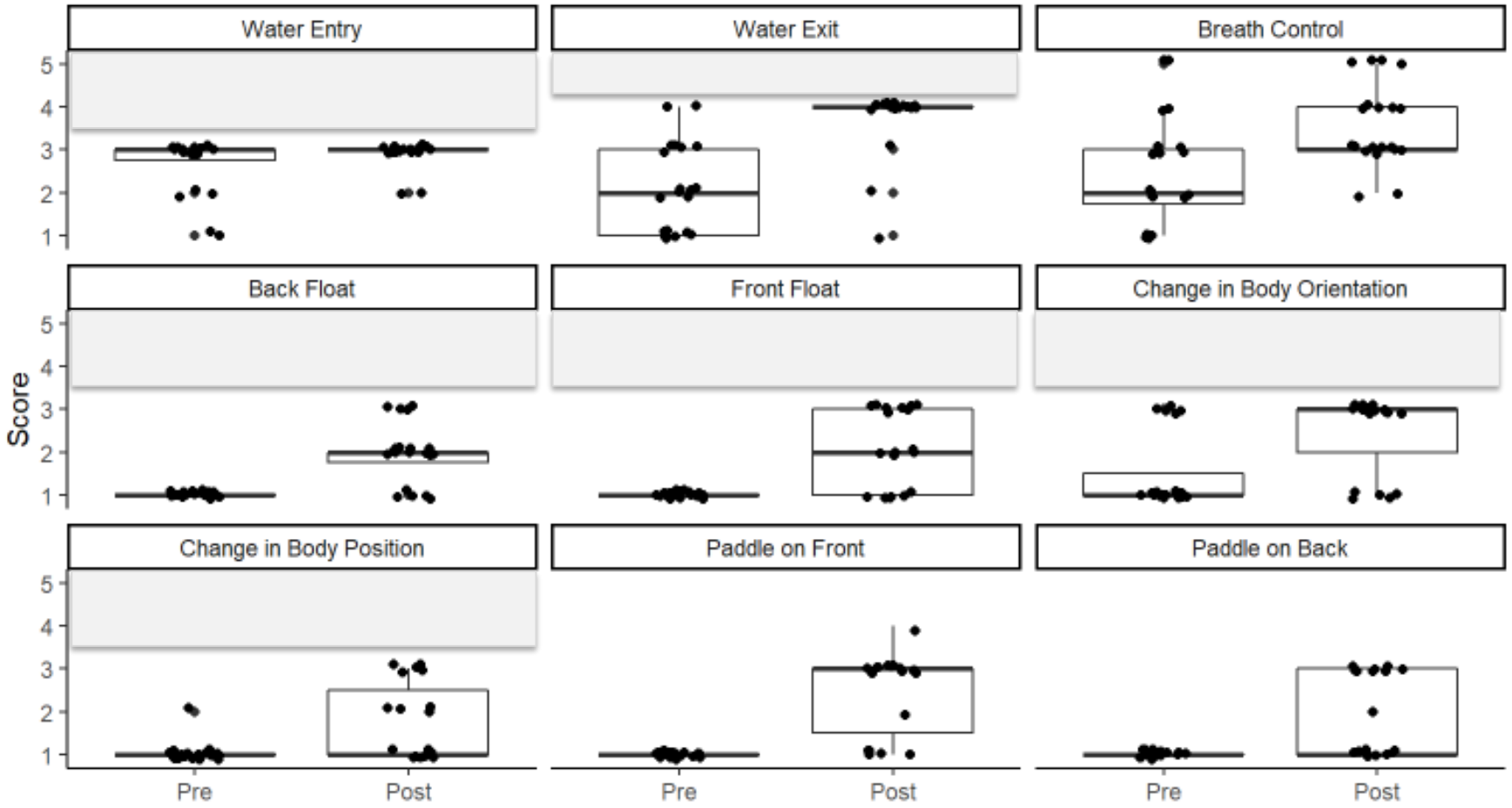


RQ2 Results: Total Water Competency Components for PCA Skills



Breath Control, Paddle on Front and Paddle on Back have scale of 1 – 5
Water Exit has scale of 1 – 4
All other variables have a scale of 1 - 3

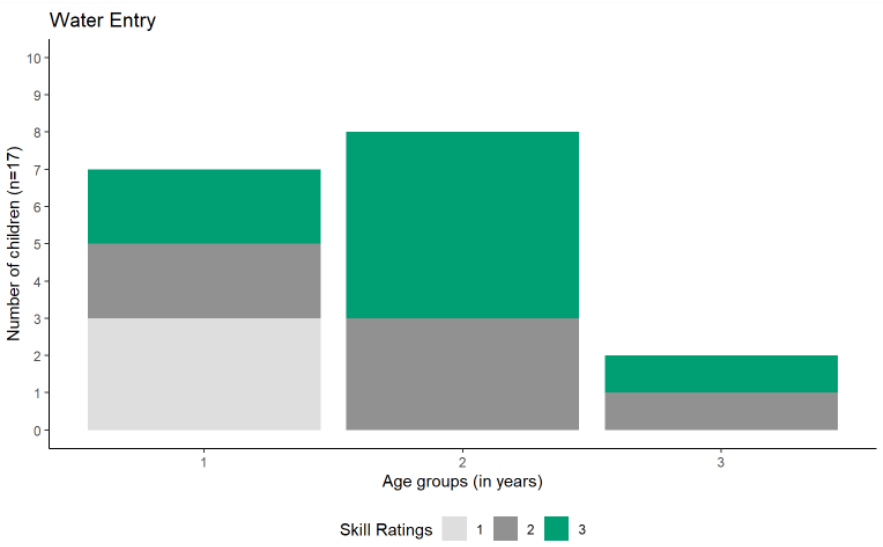
RQ2 Results: Total Water Competency Components for PSA Skills



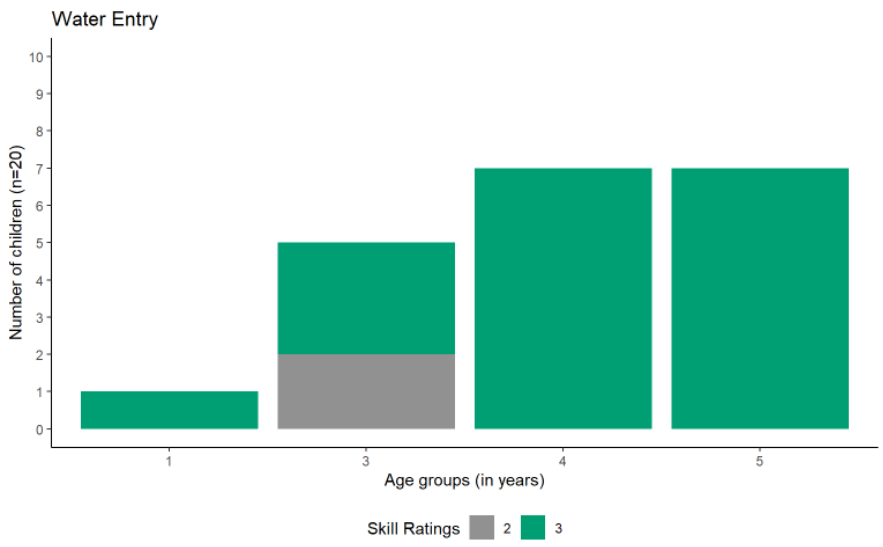
Breath Control, Paddle on Front and Paddle on Back have scale of 1 – 5
Water Exit has scale of 1 – 4
All other variables have a scale of 1 - 3

RQ2 Results: Total Water Competency Components by Age

PCA



PSA



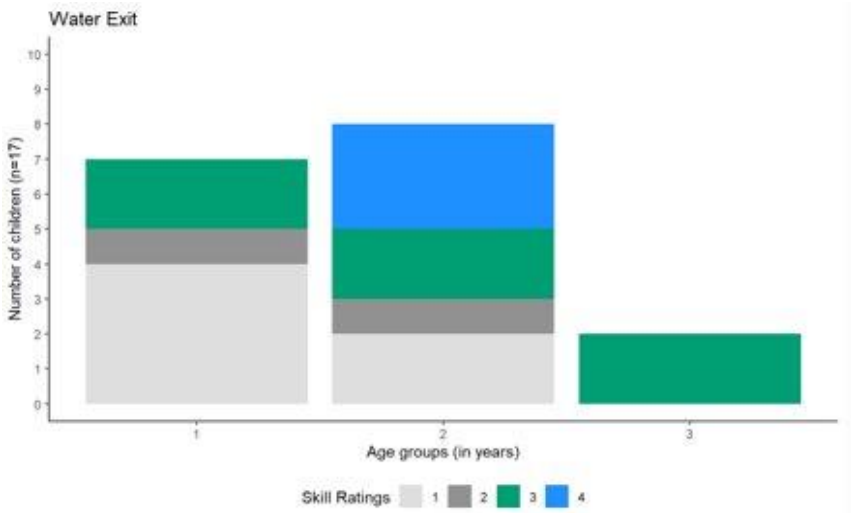
Water Entry Component Sequence (WE)

1. No voluntary entry demonstrated
2. **Adult- or flotation-supported feet-first entry**
3. Unassisted voluntary feet-first entry

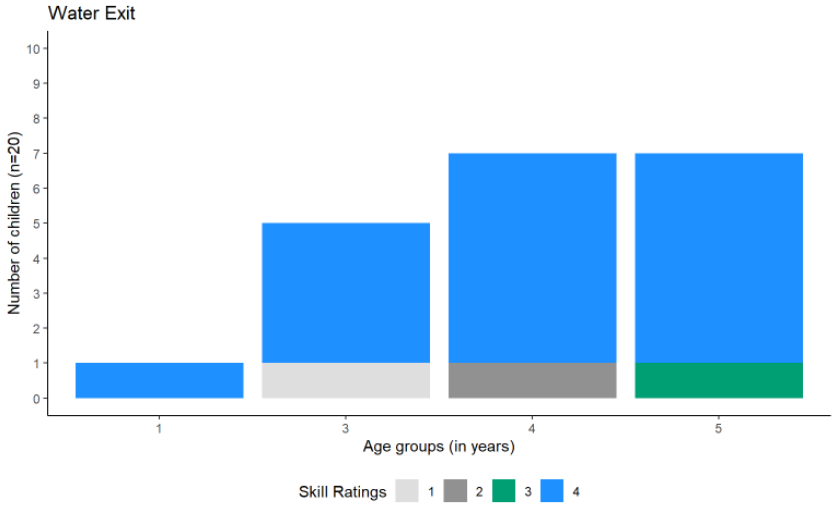
Green represents the threshold in the scale for "Unsupported Behavior Demonstrated"

RQ2 Results: Total Water Competency Components by Age

PCA



PSA



Water Exit Component Sequence (WX)

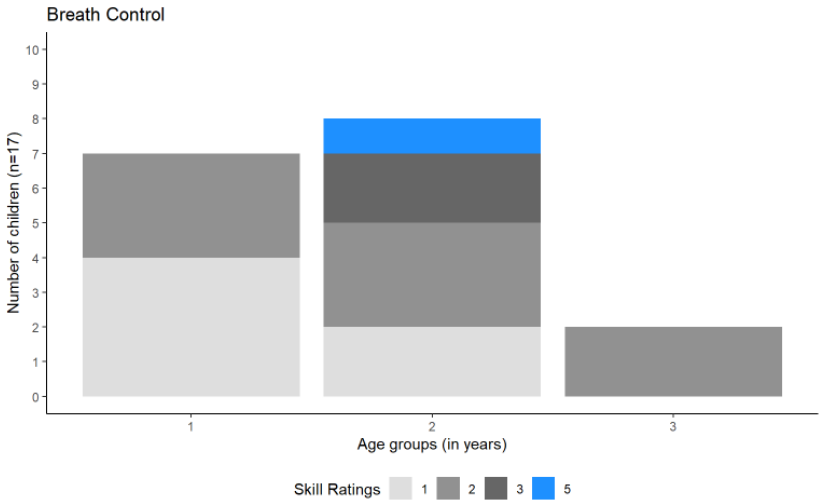
1. Caregiver-supported exit to pool side or position of safety
2. **Flotation-supported or caregiver-assisted exit to pool side or position of safety**
3. Independent exit to pool side or position of safety
4. Independent exit to pool side and exit from pool (over the side, up the stairs, ramp or ladder)

American Red Cross
Training Services

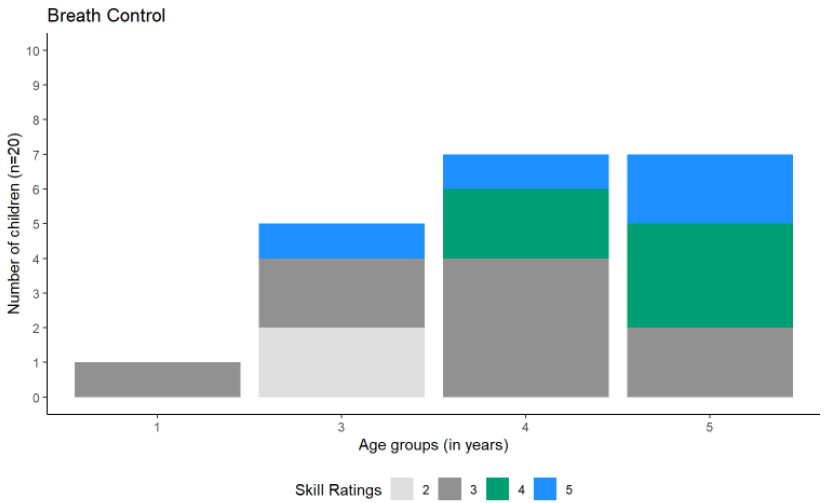
- *Green represents the threshold in the scale for "Unsupported Behavior Demonstrated"*
- *Blue represents advanced behaviors beyond the threshold*

RQ2 Results: Total Water Competency Components by Age

PCA



PSA



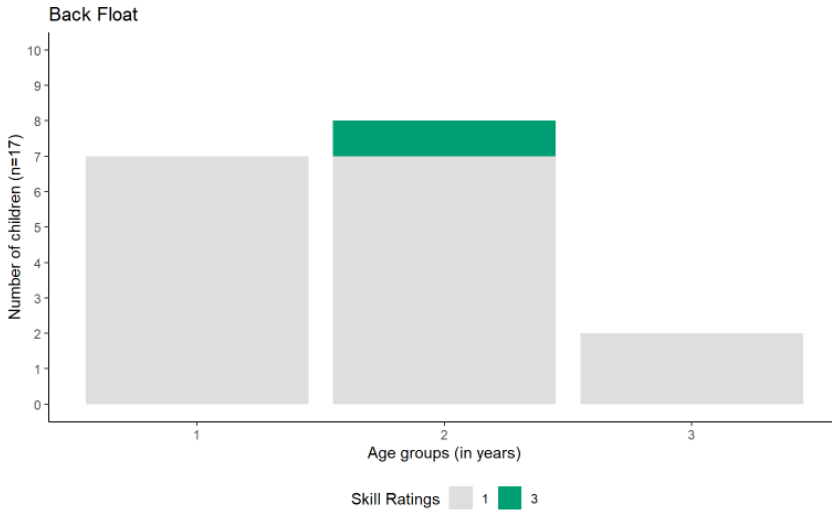
Breath Control Component Sequence (BC)

1. No voluntary submersion attempted
2. **Voluntary partial facial submersion (i.e., mouth and/or nose)**
3. Voluntary full face and/or head submersion
4. Repeated voluntary submersion/breath-holding
5. Extended (i.e., >3 sec.) voluntary breath holding and/or repeated rhythmic breathing with skill such as entry or flotation

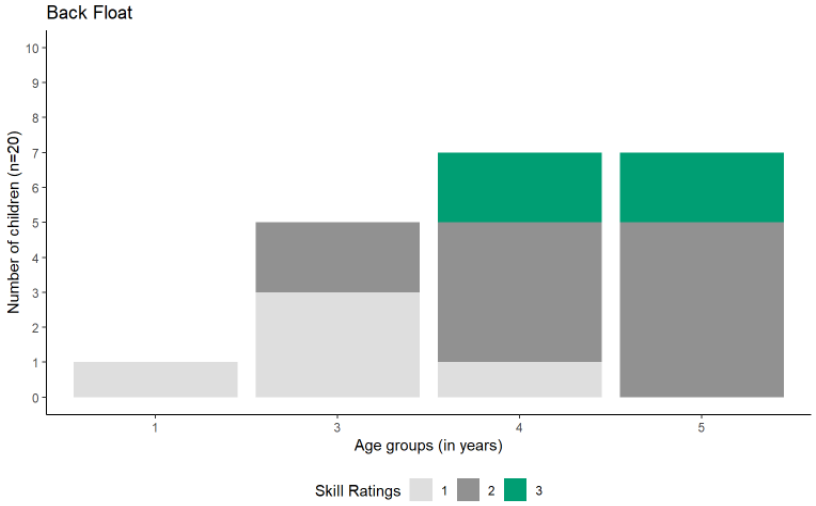
- *Green represents the threshold in the scale for "Unsupported Behavior Demonstrated"*
- *Blue represents advanced behaviors beyond the threshold*

RQ2 Results: Total Water Competency Components by Age

PCA



PSA



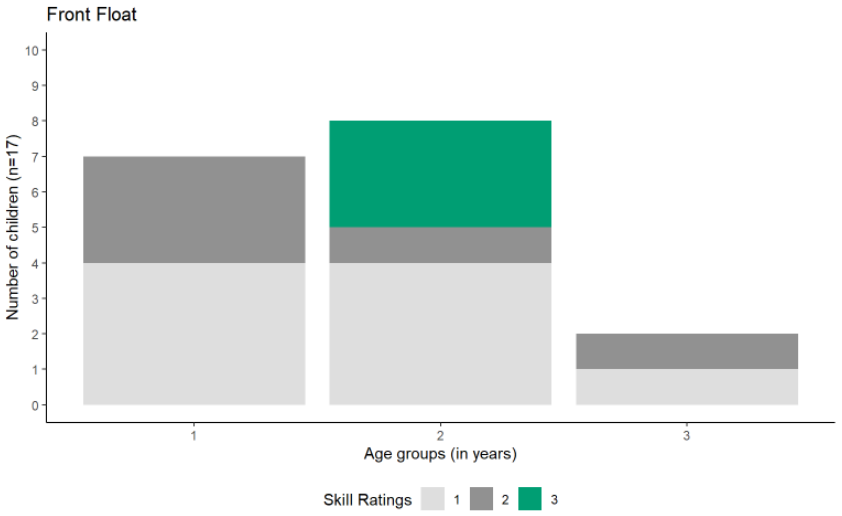
Back (Supine) Buoyancy/Flotation Component Sequence (BF)

1. Back flotation with adult support or with flotation device support
2. **Momentary (1-5 sec.) voluntary back flotation**
3. Independent (>5 sec.) voluntary back flotation

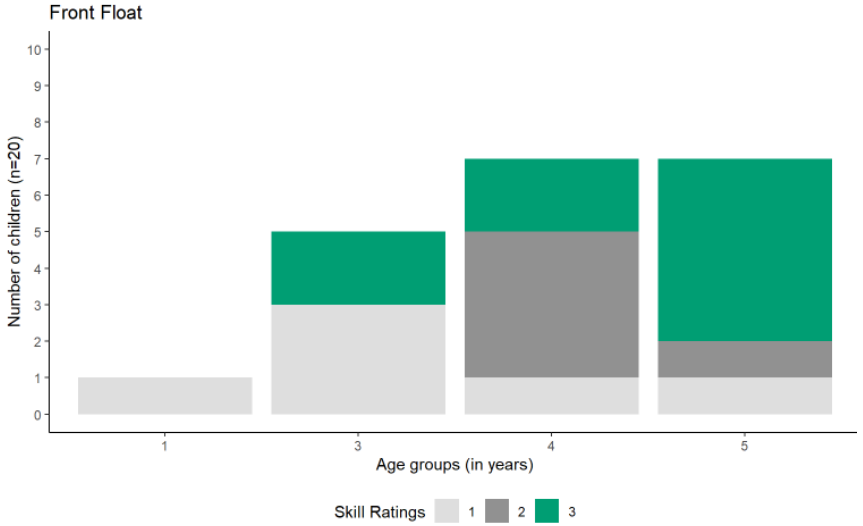
Green represents the threshold in the scale for "Unsupported Behavior Demonstrated"

RQ2 Results: Total Water Competency Components by Age

PCA



PSA



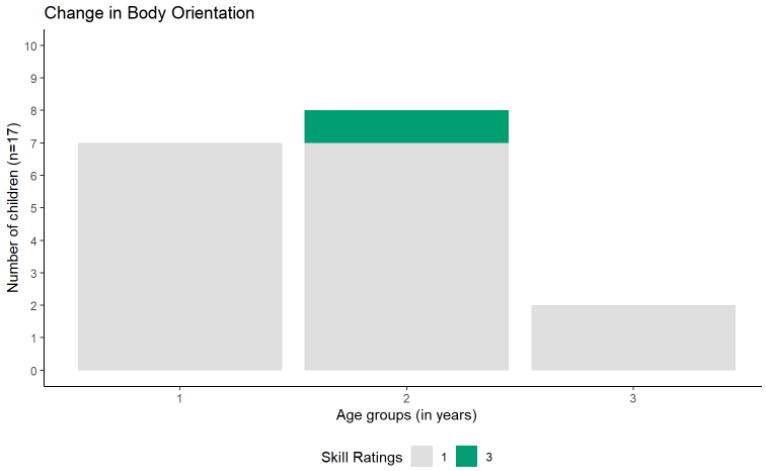
Front (Prone) Buoyancy/Flotation Component Sequence (FF)

1. Front flotation with adult support or with flotation device support
2. **Momentary (1-3 sec.) voluntary front flotation**
3. Independent (>3 sec.) voluntary front flotation

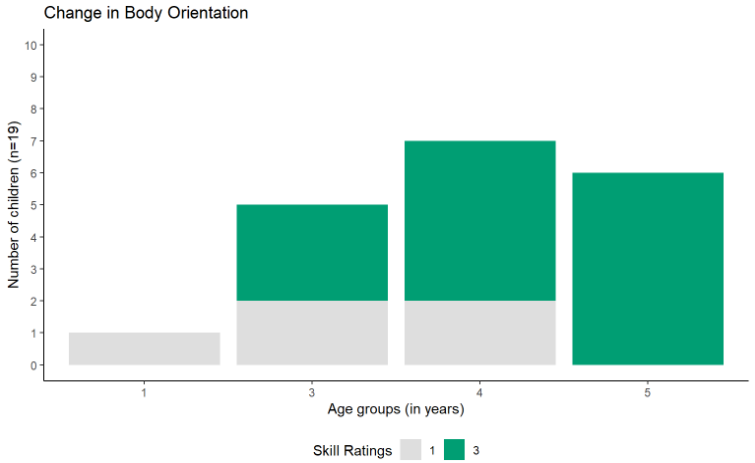
Green represents the threshold in the scale for "Unsupported Behavior Demonstrated"

RQ2 Results: Total Water Competency Components by Age

PCA



PSA



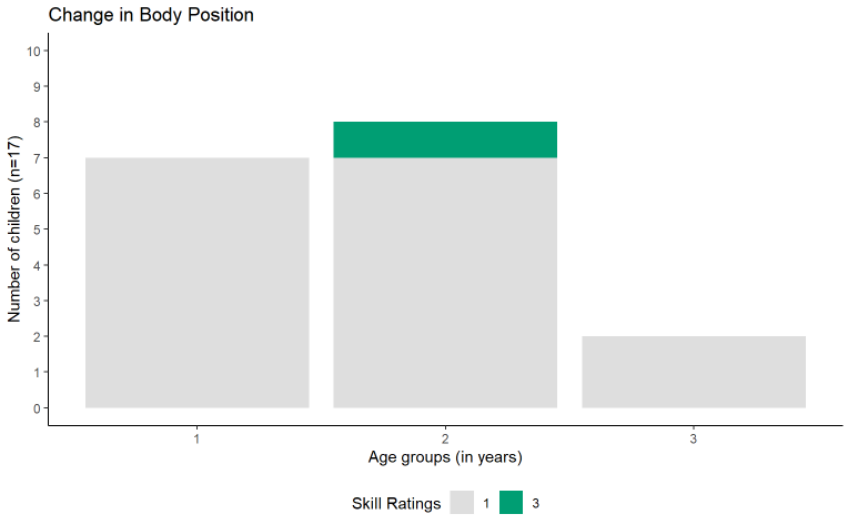
Change in Body Orientation (turning around while vertical) **Component Sequence (CBO)**

1. Voluntary change in body orientation while standing in water (i.e., touching bottom or side)
2. **Flotation-device supported voluntary change in body orientation**
3. Unsupported voluntary change in body orientation while in water

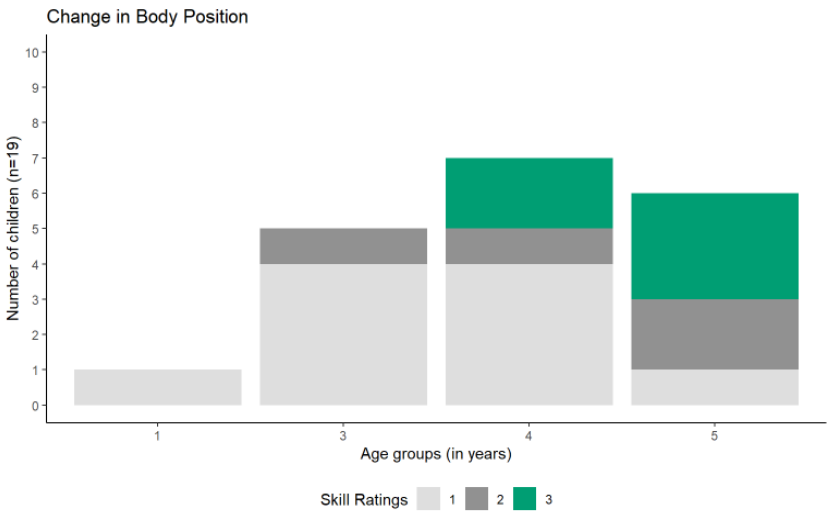
Green represents the threshold in the scale for "Unsupported Behavior Demonstrated"

RQ2 Results: Total Water Competency Components by Age

PCA



PSA



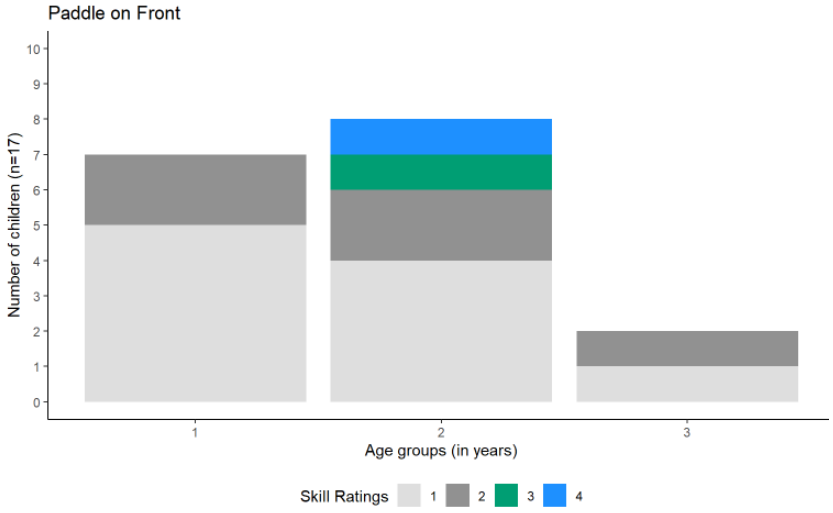
Change in Body Position (rolling over & vertical to horizontal) **Component Sequence (CBP)**

1. Adult supported body position change
2. **Flotation-device supported voluntary change in body position**
3. Unsupported voluntary change in body position

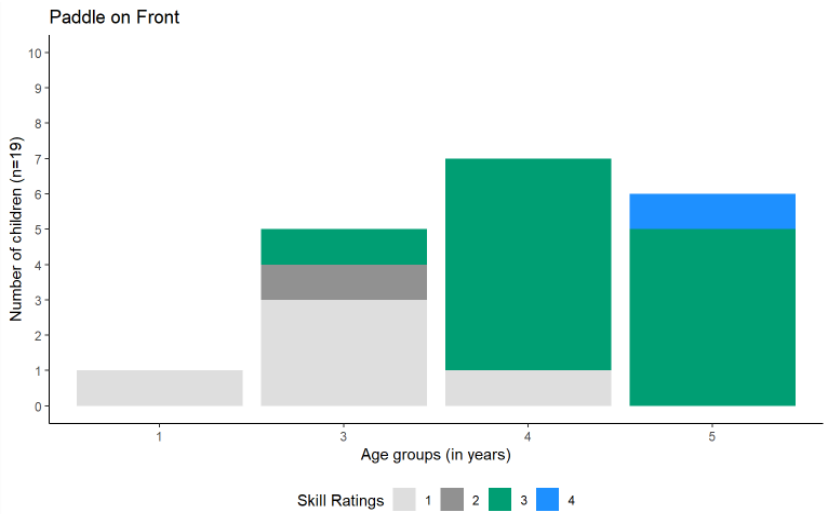
Green represents the threshold in the scale for "Unsupported Behavior Demonstrated"

RQ2 Results: Total Water Competency Components by Age

PCA



PSA



Swimming on Front Component Sequence (SF)

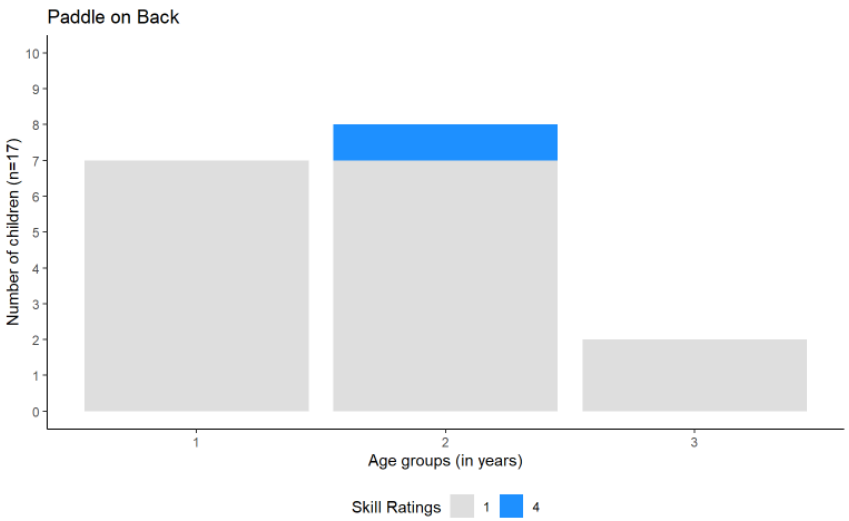
1. Adult-supported front gliding or paddling
2. **Flotation device-supported front gliding, paddling or stroking**
3. Unsupported front gliding or paddling for 2–3 body lengths
4. Unsupported front paddling or stroking for >3 body lengths
5. Unsupported front paddling or stroking for 25 yards

American Red Cross
Training Services

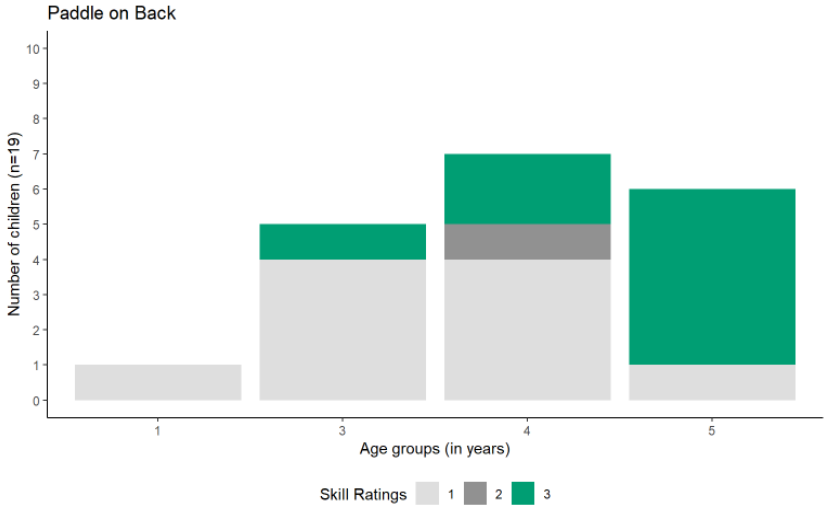
- *Green represents the threshold in the scale for "Unsupported Behavior Demonstrated"*
- *Blue represents advanced behaviors beyond the threshold*

RQ2 Results: Total Water Competency Components by Age

PCA



PSA



Swimming on Back Component Sequence (BF)

1. Adult-supported back gliding or paddling
2. **Flotation device-supported back gliding, paddling or stroking**
3. Unsupported back gliding or paddling for 3–4 body lengths
4. Unsupported back paddling or stroking for >4 body lengths
5. Unsupported back paddling or stroking for 25 yards

- *Green represents the threshold in the scale for "Unsupported Behavior Demonstrated"*
- *Blue represents advanced behaviors beyond the threshold*

Research Question 2: Results

At what age(s) did most children achieve levels of unsupported swimming behaviors across all water competence components among 1- to 5-year-old children after participating in formal group swim lessons?

- In general, consistent with principles of motor skill development, children achieved levels of unsupported behaviors as age increased.
- A majority of children in both PCA and PSA showed attainment or progress towards attainment of water entry and water exit skills.
- In both PCA and PSA, skills that might be considered more advanced, such as back float, change in body orientation, change in body position or swimming on back, showed less attainment.
- More children demonstrated a propensity for a front float rather than a back float. This finding was similar for swimming on front compared to swimming on back.
- Children of the same age who participated in PSA versus PCA showed more attainment or progress towards attainment of skills.

Discussion: Research Questions 1 & 2 Results

Why the difference in results between PCA and PSA?

PCA

- PCA is an aquatic readiness/water familiarization program whose pedagogy is not primarily designed to "teach swimming" so it should not be surprising that children are not achieving higher levels of water competence.
- Since the PCA employs the child's caregiver as a "facilitator" during the experience, the program may not provide sufficient instructional techniques to enable them to provide instruction to caregivers that will help them facilitate their children's attainment of unsupported swimming behaviors when developmentally ready.
- Most 1- to 3-year-old children in PCA may not be developmentally ready to acquire more advanced levels of swimming behaviors nor have they had sufficient experience in the water as they have had with terrestrial motor skills such as walking.

PSA

- The significant changes in all the water competence components suggest that the pedagogy and methods of this program are well matched with the aquatic readiness levels of 3- to 5-year-old children.
- Even so, the median age of the current sample was 4 years. While we saw significant improvements pre- to post-test, we did not observe unsupported behaviors among most of the children for all the water competence components.
- This observation supports the findings of some previous studies (e.g., Erbaugh, 1979) that most young children do not acquire unsupported behaviors until 4.5 or older ages which may suggest one or more developmental rate limiters exist.
- The data from the current study do not address these issues. Further research is needed.

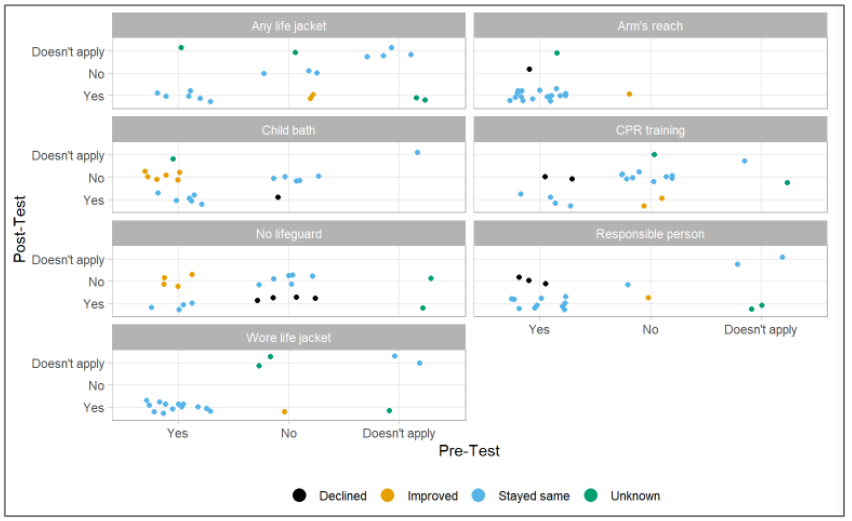
Research Question 3: Results

The following information represents responses from survey data from caregivers collected during the study.

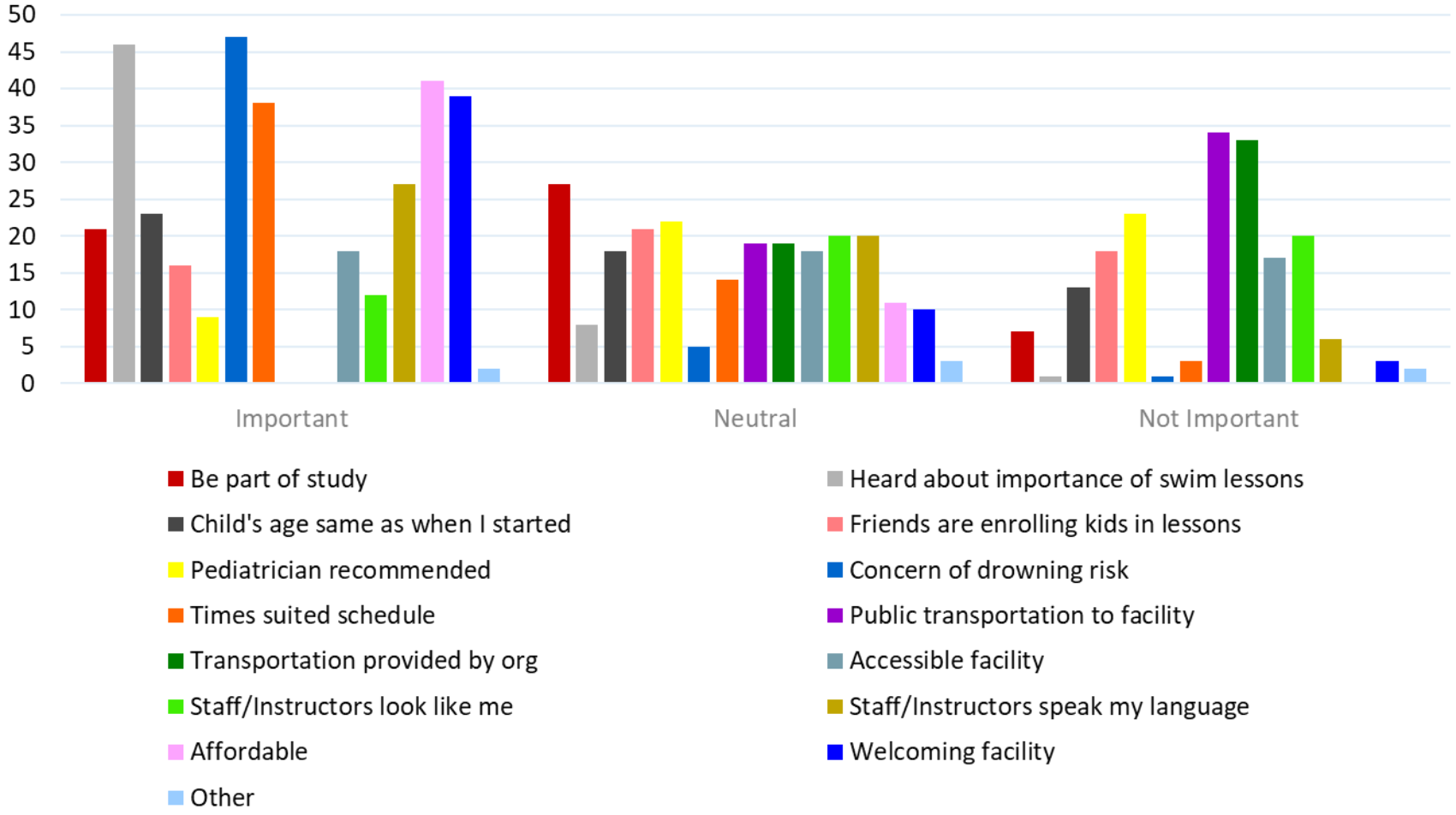
After analysis it was concluded that, based on challenges with survey design and quality of responses, the validity and reliability of the outcomes/results are potentially not strong enough for publication.

Research Question 3: Visualizing the Results

- Results in the following section are limited to respondents for which both pre- and post-participation survey data were available. Reporting responses in this manner allows for the interpretation of changes from pre- to post-participation.
- The graphs in this section are constructed to show these possibilities of change:
  1. Declined: meaning, the response went in the opposite direction of the desired response
  2. Improved: meaning, the response went in the direction of the desired response
  3. Stayed Same: meaning, the response was the same on the pre- and post-survey
  4. Unknown: respondents selected "does not apply" on either the pre- or post-survey
- The scatterplot shows the individual responses using color codes to depict each outcome.

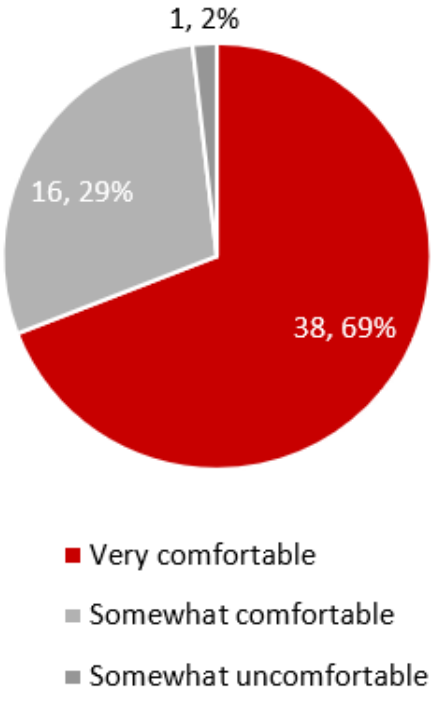


Motivation for Enrollment in Swim Lessons

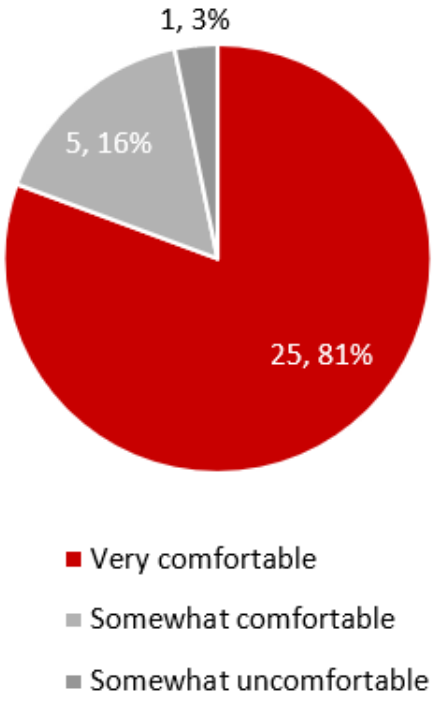


Related to Comfort Level

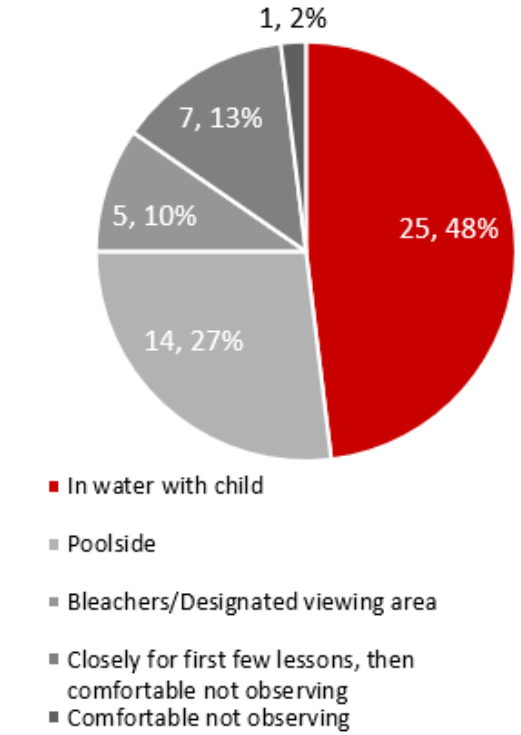
Comfort Level in Enrolling Child



*PCA: Comfort of Caregiver in Water



Preferred Observation Situation



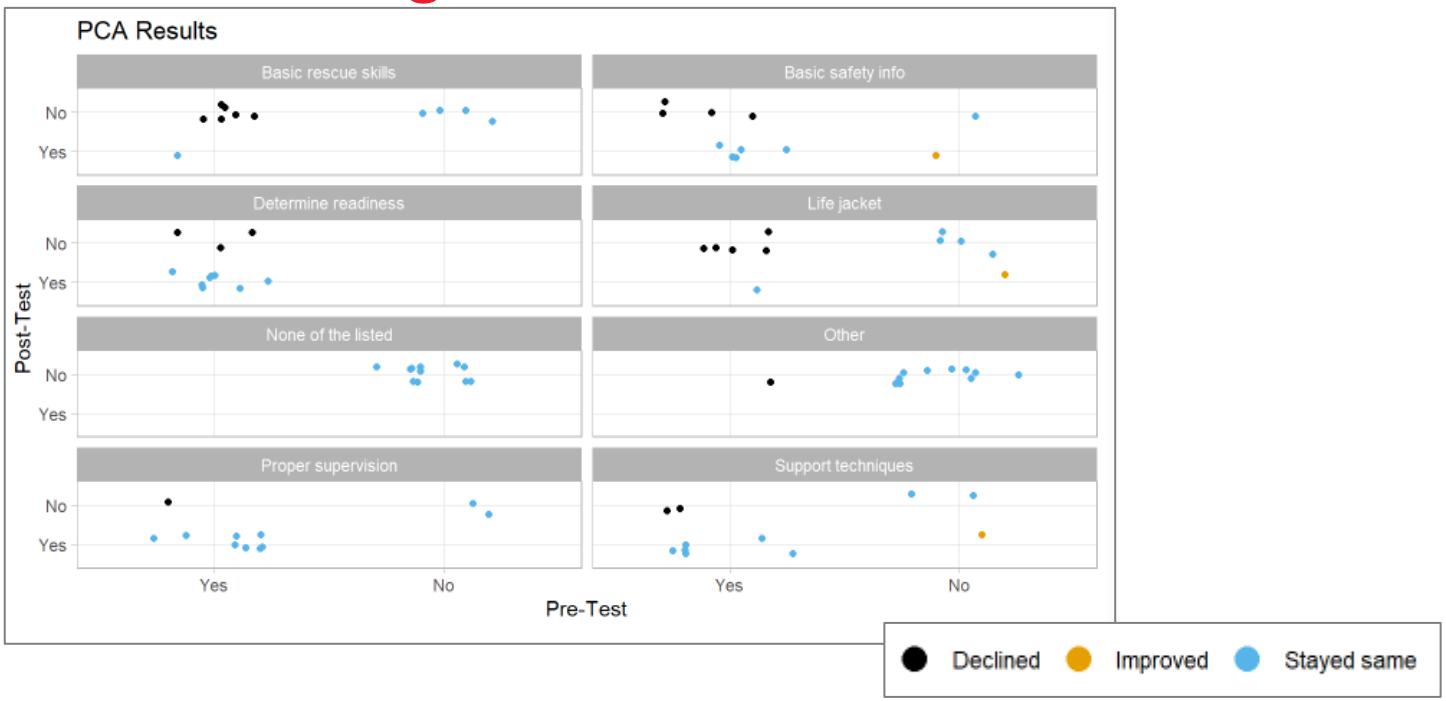
Note: This question was intended to be answered only by those participating in PCA, but some caregivers in PSA may have also answered this question on the paper version of the survey instrument.

Caregivers Expectation of Their Learning of Water Safety versus Actual

Lead In Questions	Pre- or Post-
As a parent/caregiver, what do you expect to learn during this set of swim lessons? Select all that apply.	Pre-
Which of the following did you learn during this set of swim lessons? Select all that apply.	Post-

Statements	Key for Visualization
Basic water safety information	Basic safety info
How to properly supervise and maintain safe behavior around the water	Proper supervision
How determine my child's readiness to try basic skills and support their learning	Determine readiness
How to select, properly fit, and use a life jacket	Life jacket
How to perform basic water rescue skills, such as reaching and throwing assists	Basic rescue skills
For Parent and Child Aquatics Only: How and when to use holding and support techniques for my young child	Support techniques
Other: Please specify:	Other
I don't expect to learn these types of information during my child's swim lessons	None of the listed

Caregivers Expectation of Their Own Learning versus Actual



Key Findings:

- In PCA, most caregivers expected to – and did – learn about:
  - How to determine child's readiness to try skills
  - Proper supervision
  - Support techniques
- For life jackets, basic safety information and basic rescue skills:
  - About half did not expect to – and did not – learn this information
  - About half expected to – and did – learn this information

Caregivers Expectation of Their Own Learning versus Actual

Key Findings:

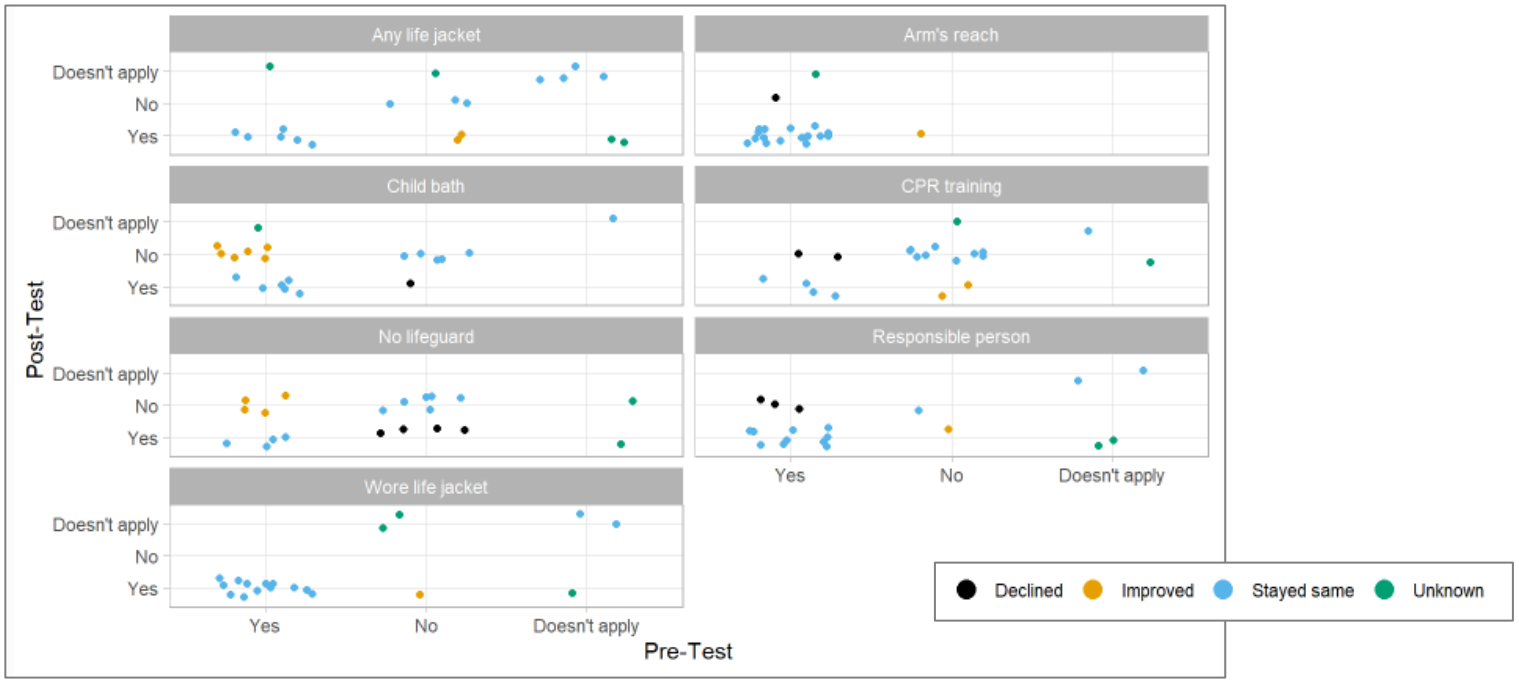
- In PSA, most caregivers expected to – and did - learn about:
  - Basic safety information
  - How to determine child's readiness to try new skills
  - Proper supervision
- For life jackets and support techniques, most did not expect to – and did not – learn this information
- For basic rescue skills, whether they expected to or not, most did not learn about this information.

Caregiver Water Safety Behaviors

Lead In Questions	Pre- or Post-
For each of the following, please indicate if it is something you did or did not do, or if it does not apply to you. Select one answer for each statement.	Pre- and Post-
Statements – Options were "Yes, I did this", "No, I did not do this" or "This does not apply to me"	**Key for Visualization**
The last time I went boating, I wore a U.S. Coast Guard-approved life jacket.	Wore life jacket
**The last time I went to a public pool or beach, I went to a place where there were no lifeguards on duty.*	*No lifeguard*
The last time I went swimming, any weak or inexperienced swimmers wore U.S. Coast Guard-approved life jackets.	Any life jacket
The last time I went swimming with a young child, I stayed within arm's reach of that child at all times whenever he/she was in the water.	Arm's reach
The last time I was with a group of people around the water, such as a pool party at a home pool, a responsible person was designated to constantly watch the activity around the water at all times.	Responsible person
**The last time I bathed a young child, I felt comfortable stepping away once the child was in the water (such as to grab a towel or respond to the needs of another child), as long as I was quick.*	*Child bath*
I have taken CPR training within the last 2 years.	CPR training

**For statements with an asterisk and in italics, the correct answer is "no."*

Caregiver Water Safety Behaviors



Key Findings:

- In both the pre- and post-surveys, most caregivers responded that they:
  - Stayed within arms' reach
  - Wore a life jacket when on a boat
- Improvements were realized in designating a responsible person when around the water
- Desired responses showed decline in maintaining supervision during a child's bath
- Equal amount of improvement and decline occurred in:
  - Swimming in areas with no lifeguards
  - CPR training within the last 2 years

Caregiver Water Safety Knowledge

Lead In Questions	Pre- or Post-
Which of the following statements do you believe to be true? Select all that apply.	Pre- and Post-
Statements	**Key for Visualization**
**Inflatable devices, such as water wings, swim rings, and inflatables, are equivalent to U.S. Coast Guard-approved life jackets and can be counted on as lifesaving devices.*	*Inflatable devices*
Drowning is the leading cause of unintentional injury-related death for children ages 1-4 years and second for children ages 5-14.	Drowning leading injury
**If you see someone in trouble in the water, you should immediately enter the water to get them out.*	*Enter water to help*
**As long as a lifeguard is on duty, it is not necessary for you to maintain constant supervision of children who are in the water.*	*Supervision*
**A drowning child splashing and struggling in the water typically makes enough noise to alert someone for help.*	*Hear splashing*
Any water deep enough to cover the mouth and nose is a potential drowning hazard.	Drowning hazard
One of the best ways to prevent drowning of young children at a home pool is to prevent unsupervised access to the water with barriers, such as fencing.	CPR training
Effective supervision of children around a pool requires total and constant attention to those in the water from a person who knows how to swim and has knowledge of water safety.	Total attention
Children should only enter the water after they have received permission. They should be taught to ask first.	Permission
When choosing a place to swim, you should choose areas that are protected by lifeguards.	Choose safe areas
Before putting your child in the water for a bath, you should gather everything you will need, such as towels, shampoo, and tub toys, so that you don't step away, even for a moment.	Bath preparation

**For statements with an asterisk and in italics, the correct answer is "false."*

Research Results: Question 3

What motivations, water safety knowledge and experiences of parents/caregivers of children between the ages of 1 and 5 years may be related to their participation in swim lessons?

- Caregivers responded that the most important motivations for enrolling their children in these swim lessons were:
  - Concern of risk of drowning
  - They had read/heard of the importance of swim lessons
  - Affordability of these lessons
  - Welcoming facility
  - Times that suited their schedules
- Least important factors were related to access to public transportation or transportation being provided by the organization.
- The majority of caregivers were very comfortable with enrolling their children in swim lessons, and *for PCA, getting in the water as part of the lessons with their children.
- When asking caregivers about their safety behaviors compared to knowledge, there were more improvements in knowledge rather than behavior.

PCA – Parent and Child Aquatics

**Note: This question was intended to be answered only by those participating in PCA, but some caregivers in PSA may have also answered this question on the paper version of the survey instrument.*

Continued on next slide

Research Results: Question 3 *(Continued)*

What motivations, water safety knowledge and experiences of parents/caregivers of children between the ages of 1 and 5 years may be related to their participation in swim lessons?

- About half of caregivers preferred being in the water with their children during lessons.
  - Following that, the next highest answer was observing poolside.
  - Only 1 caregiver responded that they were comfortable not observing swim lessons.
- Related to expectation of learning about water safety, in both PCA and PSA:
  - Most caregivers expected to – and did – learn water safety information, such as basic water safety information, proper supervision and determining their child's readiness to try new skills, during the swim lesson experience.
  - However, they did not expect to – and did not – learn basic water rescue skills or about life jackets. All of this information was part of the curriculum used for this study.

Challenges to Accessing AI/AN Populations

- In the winter of 2021/22, surges in COVID-19 variants impacted our ability to conduct the study in American Indian and Alaska Native populations, which was desired for this study.
- The research team sought out up to 10 different providers of swim lessons that are known to serve AI/AN populations. None were able to participate due to impacts of the pandemic, they did not offer programming for 1- to 5-year olds and/or the seasonality of their program did not align with the timing requirements of the study agreement.
- This apparent lack of appropriate programs that serve the AI/AN population for the 2021/22 research study – especially young children – suggests that there may be more significant barriers to accessing swim lessons and water safety training than was previously understood.

Other Challenges and Lessons Learned

Lessons Learned

- Inconsistent attendance and high attrition
- Reduced sample size

Possible factors:

- Family dynamics such as:
  - Caregiver work/life balance on child participation in lessons;
  - Programmatic time commitment (e.g., lessons > than once-a-week)

Challenges

- Parental completion of both the pre- and post-participation surveys revealed the following:
  - It is unknown if the same caregiver responded to both surveys;
  - Completion of the paper version of the survey, on deck, may have impacted caregivers' level of concentration in answering survey questions

Study Limitations

- The social-emotional readiness of the children was not assessed.
- Surveys were available in English-language only with limited translation available.
- The research team was not able to be on site regularly for make-up assessments. In those cases, the team relied upon video records for assessment when available.
- Sites were inconsistent in some cases regarding providing the requested video recordings.
- In analysis of questions with checkboxes, it was assumed that a checkbox which was not selected takes on a value of no, rather than a value of "NA" (i.e., missing data because the respondents skipped that checkbox).

Recommendations

- These studies provide preliminary evidence that swim lesson programs for young children may be able to introduce water competency-based skills earlier than previously thought. Further research should be conducted to validate these findings and support the development of new learn-to-swim curricula that address this concept in developmentally-appropriate manner.
- Curriculum developers for caregiver-assisted swim lessons, such as PCA, should include training for swim instructors to enable them to provide instruction to caregivers that will help them facilitate their children's attainment of unsupported swimming behaviors when developmentally ready.
- Findings from this study's survey results appear to be congruent with previous results that revealed issues around scheduling as a primary barrier for participation in swim lessons. This issue was apparent in this study which was asking for participation in multiple sets of lessons, 2 to 3 times a week for 6 to 9 weeks. Anecdotal evidence suggests that more than once per week is often prohibitive among busy families.

PCA – Parent and Child Aquatics

Recommendations *(Continued)*

- Results from this study suggest that caregivers did gain some water safety knowledge through their children's participation in swim lessons. These outcomes resonate to the findings from the Year 1, Phase 1 study which revealed that caregivers expected to learn water safety information through their child's participation in swim lessons. As such:
  - Curriculum developers should integrate water safety topics more fully into all levels of swim lessons.
  - Training providers should ensure that swim instructors:
    - Cover water safety topics during swim lessons for the in-water participants.
    - Provide additional water safety information to caregivers as an integral part of their swim lesson programs.

Projected Impacts on Future Curriculum Development and Programming

- The following recommendations are in agreement with findings from the previous Year 1, Phase 2 study:
  - Swim lesson curriculum developers can use the resulting information from this study to examine and revise the effectiveness of swim lesson programs for young children.
  - Earlier attainment of unsupported levels of water competence may have a buffering effect against drowning.
  - Consider employing teaching/learning techniques including progressions and activities which have an evidence basis that may leads to earlier achievement of unsupported swimming behaviors.
  - Progressions leading to unsupported skills may be introduced earlier in completion requirements for swim lesson levels for children ages 1 to 4 years.
  - Consider designing assessments that are a composite of multiple components of water competence (i.e., “putting it all together”).
  - All swimming skill completion requirements should be designed to conclude with the child reaching a position of safety (e.g., poolside, standing water depth or exiting the water).
  - For caregiver-assisted lessons, such as PCA, consider establishing completion requirements (e.g., exit skills assessments), but keep the aquatic readiness focus.

Continued on next slide

Projected Impacts on Future Curriculum Development and Programming *(Continued)*

- The following are additional recommendations based on findings from this study:
  - Swim instructors should be taught how to manage scope of skill levels among participants in a class (i.e., individualize instruction).
  - Swim instructors in PCA should be taught to educate caregivers how to facilitate their children's progress toward unsupported swimming behaviors while under instructor supervision.
  - Water safety education should be fully integrated into the swim lesson experience of children and caregivers (i.e., during the in-water portion of swim lessons as well as additional information provided to caregivers regardless of whether the caregiver is in the water with the child or not). Only the caregivers can create a safe water environment around the home, and they need the knowledge and tools to implement it (e.g., create barriers, alarms, supervision).
  - Additional research needs to examine the order among components in which skills are best acquired at various ages. Some components (e.g., breath control) may serve as "rater limiters" to acquisition of other components (e.g., front float).

Next Steps: Dissemination of Findings

The findings from Study 1, Phase 2 and Study 2 will be combined into a single abstract and manuscript.

Articles and abstracts are intended to be submitted to the following:

- Publications
  - *International Journal of Aquatic Research and Education*
  - *American Journal of Public Health*
  - *Pediatrics*
  - *Injury Prevention*
  - *BMC Public Health*
- Presentations
  - *American Public Health Association* Conference
  - *Association of Aquatics Professionals* Conference
  - *Diversity in Aquatics* Convention
  - *World Aquatic Health* Conference
  - *National Drowning Prevention Alliance Water Safety* Conference

References

Brenner, R. A., Taneja, G. S., Haynie, D. L., Trumble, A. C., Qian, C., Klinger, R. M., & Klebanoff, M. A. (2009). Association between swimming lessons and drowning in childhood: a case-control study. *Archives of Pediatrics & Adolescent Medicine*, *163*(3), 203-210. https://doi.org/10.1001/archpediatrics.2008.563

Centers for Disease Control and Prevention. 2020. "Fatal Injury Data." https://www.cdc.gov/injury/wisqars/fatal.html

Costa, A. M., Frias, A., Ferreira, S. S., Costa, M. J., Silva, A. J., & Garrido, N. D. (2020). Perceived and Real Aquatic Competence in Children from 6 to 10 Years Old. International journal of environmental research and public health, 17(17), 6101. https://doi.org/10.3390/ijerph17176101

De Pasquale, De Sousa Morgado, L., Jidovtseff, B., De Martelaer, K., Barnett, L. M., & Smith, J. (2021). Utility of a scale to assess Australian children's perceptions of their swimming competence and factors associated with child and parent perception. Health Promotion Journal of Australia, 32(2), 106–115. https://doi.org/10.1002/hpja.404

Denny, S.A., Quan, L., Gilchrist, J., McCallin, T., Shenoi, R., Yusuf, S., Hoffman, B., & Weiss., J. (2021). Prevention of drowning. AAP Council on Injury, Violence, and Poison Prevention. *Pediatrics. 143(5).* e20190850. https://doi.org/10.1542/peds.2019-0850

Layne, T. E., Irwin, C. C., Pharr, J. R., & Irwin, R. L. (2020). Factors impacting swimming participation and competence: A qualitative report. International Journal of Aquatic Research and Education, 12(4), Article 10. DOI: https://doi.org/10.25035/ijare.12.04.10 Available at: https://scholarworks.bgsu.edu/ijare/vol12/iss4/10

Continued on next slide

References *(continued)*

Moran, K., Blitvich, J., Petrass, L., & McElroy, G.K. (2021). Getting In: Safe Water Entry Competencies, *International Journal of Aquatic Research and Education, 13:*2, Art. 4. https://doi.org/10.25035/ijare.13.02.04

Quan, L., Ramos, W., Harvey, C., Kublick, L., Langendorfer, S., Lees, T. A., Fielding, R.R., Dalke, S., Barry, C., Shook., & Wernicki, P. (2015). Toward defining water competency: An American Red Cross definition. *International Journal of Aquatic Research and Education*, *9*(1), Art. 3. https://doi.org/10.25035/ijare.09.01.03

Roberton, M. A., Williams, K., & Langendorfer, S. (1980). Pre-longitudinal screening of motor development sequences. *Research Quarterly for Exercise and Sport*, *51*(4), 724-731. https://doi.org/10.1080/02701367.1980.10609334

Taylor, D. H., Franklin, R. C., & Peden, A. E. (2020). Aquatic Competencies and Drowning Prevention in Children 2-4 Years: A Systematic Review. *Safety, 6*(2), https://doi.org/10.3390/safety6020031

Trinidade Wizer, R. & de Souza Castro, F. A. (2021). Effects of age and experience on the development of aquatic competence in children aged 36 to 72. *Motricidade*: Vol. 17 No. 3 https://revistas.rcaap.pt/motricidade/article/view/24096

Appendix A: Teaching Tools

Course Outlines
Component Sequence Charts
Course Skills Charts

Course Outlines

Parent and Child Aquatics Level 1 Outline

Recommended Equipment

- Pool toys, such as floating rubber animals, rings and sinking objects
- U.S. Coast Guard-approved life jackets of appropriate sizes for parents and children
- Flotation devices, such as foam noodles, kickboards or swim bars

Skills	Completion Goals	WCAG	References
Holding and Support Techniques			
Face-to-face positions			WSIM, Ch3
■ Hug position	Demonstrate (parent)		
■ Chin support	Demonstrate (parent)		
■ Shoulder support on front	Demonstrate (parent)		
Back-to-chest position			
■ Cuddle	Demonstrate (parent)		
Side-to-side position			
■ Hip straddle	Demonstrate (parent)		
■ Shoulder support on side	Demonstrate (parent)		
Working with the Child			
Cueing	Demonstrate (parent)		WSIM, Ch 7
Water Adjustment, Entry and Exit			
Getting Wet			WSIM, Ch 7
■ Getting wet with toys	Explore		
■ Getting wet kicking	Explore		
Water Entry			
■ Lifting in	Demonstrate (parent)	WE1	
■ *From a seated position—rolling over and sliding in*	*Explore, with support or assistance*	WE2	
■ Walking in	*Explore, with support or assistance*	WE1	
Exploring the Pool			
■ Out-of-water exploration	Explore		
■ In-water exploration	Explore, with support *or assistance*	WE1/2	
Water Exit/Position of Safety			
■ *Hanging on to side of pool*	*Explore, with support or assistance*	WX1/2	WSIM, Ch 7
■ Lifting out	Demonstrate (parent)	WX1/2	
■ Walking out	*Explore, with support or assistance*	WX1/2	
■ **Using a ladder**	Explore, with support or assistance		
Breath Control			
Blow bubbles on the surface	Explore, with *or without* support, at least 3 seconds	BC2	WSIM, Ch 7
Blow bubbles with mouth and nose submerged	Explore, with *or without* support, at least 3 seconds	BC3	
Submerge mouth, nose and eyes	Explore, with *or without* support, at least 3 seconds	BC3	
Underwater exploration	Explore, with *or without* support, at least 3 seconds	BC3	
Buoyancy on Front			
Front float	*Explore, with support or assistance*	FF1/2	WSIM, Ch 7
Front glide	Explore, with support or assistance, at least 2 body lengths	SF1/2	*WSIM, Ch 7*
Recover from a front float or glide to a vertical position	*Explore, with support or assistance*	*CBP1/2*	
Buoyancy on Back			
Back float	Explore, with support *or assistance, at least 3 seconds*	BF1	WSIM, Ch 7
Back glide	Explore, with support *or assistance, at least 2 body lengths*	SB1/2	
Recover from a back float or glide to a vertical position	*Demonstrate, with assistance*	*CBP2*	
Changing Body Position and Direction			
Roll from front to back	Explore, with support *or assistance*	CBP1/2	WSIM, Ch 7
Roll from back to front	Explore, with support *or assistance*	CBP1/2	
Turn toward pool side	*Explore, with support or assistance*	*CBO1/2*	
Swim on Front			
Passing from instructor to parent	Explore, with support *or assistance*	SF1/2	WSIM, Ch 7
Leg action	Explore, with support *or assistance, at least 2 body lengths*	SF1/2	
Arm action	Explore, with support *or assistance, at least 2 body lengths*	*SF1/2*	
Combined movement on front	Explore, with support *or assistance, at least 2 body lengths*	*SF1/2*	
Swim on Back			
Leg action	Explore, with support *or assistance, at least 2 body lengths*	SB1/2	WSIM, Ch 7
Arm action	*Explore, with support or assistance, at least 2 body lengths*	*SB1/2*	
Combined movement on back	*Explore, with support or assistance, at least 2 body lengths*	*SB1/2*	
Water Safety			
The importance of wearing a life jacket and wearing one in water	Discuss (parent) and Demonstrate (parent and child)		SWS, Ch 2 WSIM, Ch 4
How to call for help and the importance of knowing first aid and CPR	Discuss (parent) and Demonstrate (parent and child)		
Basic water safety rules	Discuss (parent)		
General water safety around the home	Discuss (parent)		
Recreational water illnesses	Discuss (parent)		
Sun safety	Discuss (parent)		

Exit Skills Assessment

To further the child's experience of wearing a life jacket in the water and as a lead up to the exit skills assessment, have children practice each exit skills assessment while wearing a life jacket. All Parent and Child Aquatics Level 1 exit skills can be performed with support or assistance.

1. *Enter water using either the ramp, steps or side [WE1/2], travel at least 2 body lengths [SF1/2], submerge to mouth and blow bubbles for at least 3 seconds [BC2] then safely exit the water [WX1/2]. (Children can walk, move along the gutter or "swim.")*
2. *Start in the water with support from the adult [FF1], travel at least 2 body lengths using the combined movement on front [CMF1] to get to the side then safely exit the water [WX1/2].*

Parent and Child Aquatics Level 2 Outline

Recommended Equipment

- Pool toys, such as floating rubber animals and weighted diving objects
- U.S. Coast Guard-approved life jackets of appropriate sizes for parents and children
- Flotation devices, such as foam noodles, kickboards or barbells
- Reaching equipment

Skills	Completion Goals	WCAG	References
Holding and Support Techniques			
Face-to-face position • Hip support on front	Demonstrate		WSIM, Ch3
Back-to-chest positions • Hip support on back • Back support • Arm stroke	 Demonstrate Demonstrate Demonstrate		
Water Adjustment, Entry and Exit			
Water Entry • Seated position • Seated position—rolling over and sliding in • *Walking in* • Stepping or jumping in • Using a ladder • Using stairs	 Demonstrate, with assistance Demonstrate, with *or without* assistance *Demonstrate, with or without assistance* Demonstrate, with *or without* assistance Demonstrate, with *or without* assistance Demonstrate, with *or without* assistance	 WE2 WE2 WE1 WE2/3 WE2/3 WE2/3 WE2/3	WSIM, Ch7
In-water exploration	Explore, independently, in shallow water	SF1/2	
Water Exit/Position of Safety • *Walking out* • Using side of pool • Using steps or ramp • Using a ladder	 *Demonstrate, with or without assistance* Demonstrate, with *or without* assistance Demonstrate, with *or without* assistance Demonstrate, with *or without* assistance	 WX2/3 WX3 WX3 WX3 WX3	
Breath Control			
Underwater exploration • Open eyes and retrieve objects below the surface • Open eyes and retrieve submerged objects	 Explore, with support *or assistance*, in shallow water Explore, with *or without* assistance, in shallow water	 BC2/3 BC3/4	WSIM, Ch 7
Bobbing	Explore, independently, at least 10 times	BC4	
Buoyancy on Front			
Front glide	Demonstrate, with *or without* assistance, at least 2 body lengths	BC4, SF2/3	WSIM, Ch 7
Front glide to the wall	Demonstrate, with *or without* assistance, at least 2 body lengths	BC4, SF2/3	
Front float	Demonstrate, with *or without* assistance, at least 3 seconds	FF2/3	
Recover from a front float or glide to a vertical position	*Demonstrate, with or without assistance*	*CBP2/3*	
Buoyancy on Back			
Back glide	Demonstrate, with support, assistance *or independently, at least 2 body lengths*	BF2/3 SB2/3	WSIM, Ch7
Back float	Demonstrate, with support, assistance *or independently, at least 10 seconds*	BF2/3	
Recover from a back float or glide to a vertical position	*Demonstrate, with or without assistance*	*CBP2/3*	
Changing Body Position and Direction			
Roll from front to back	Demonstrate, with *or without* assistance	CBP2/3	WSIM, Ch7
Roll from back to front	Demonstrate, with *or without* assistance	CBP2/3	
Turn toward side of pool	*Demonstrate, with or without assistance*	*CBO2/3*	
Swim on Front			
Passing between adults	Demonstrate, with assistance	SF2	WSIM, Ch7
Drafting with breathing	Demonstrate, with assistance	SF2/3 BC4/5	
Leg action—alternating or simultaneous movements	Demonstrate, with *or without* assistance, *at least 3 body lengths*	SF2/3/4	
Arm action—alternating or simultaneous movements	Demonstrate, with support, assistance *or independently, at least 3 body lengths*	SF2/3/4	
Combined arm and leg actions on front with breathing	Explore, with *or without* assistance, *at least 3 body lengths*	SF2/3/4	
Swim on Back			
Leg action—alternating or simultaneous movements	Demonstrate, with *or without* assistance, *at least 3 body lengths*	SB2/3/4	WSIM, Ch 7
Arm action—alternating or simultaneous movements	Demonstrate, with support, assistance *or independently, at least 3 body lengths*	SB2/3/4	
Combined arm and leg actions on back	Explore, with or without assistance, *at least 3 body lengths*	SB2/3/4	
Water Safety			
The importance of wearing a life jacket and wearing one in the water	Discuss (parent) and Demonstrate (child)		SWS, Ch 2 WSIM Ch 4
Reaching assists	Discuss/demonstrate (parent)		
Basic water safety rules review	Discuss (parent)		
Safety at the beach and at the waterpark	Discuss (parent)		
Water toys and their limitations	Discuss (parent)		

Exit Skills Assessment

To further the child's experience of wearing a life jacket in the water and as a lead up to the exit skills assessment, have children practice each exit skills assessment while wearing a life jacket. All Parent-Child Aquatics Level 2 exit skills may be performed with assistance or independently. *A position of safety could be hanging on the wall or exiting the water.*

1. *Enter water [WE2/3], glide on front at least 2 body lengths [SF2/3], roll to back [CBP2/3], float on back for 10 seconds [BF3], recover to a vertical position, [CBP2/3] then travel to a position of safety.*
2. *Glide on back for at least 2 body lengths [SB2/3], roll to front [CBP2/3], recover to a vertical position, [CBO2/3] then travel to a position of safety.*
3. *Swim using combined arm and leg actions on front for at least 3 body lengths [SF2/3/4], roll to back [CBP2/3], float for 10 seconds [BF2/3], roll to front [CBP2/3], continue swimming on front for at least 3 body lengths [SF2/3/4] to a position of safety.*

Preschool Aquatics Level 1 Outline

Equipment

- Submersion items (such as diving rings)
- U.S. Coast Guard-approved life jackets (appropriate sizes for children)
- Unattached flotation support devices, such as foam noodles, swim bar floats and kickboards

Skills	Completion Requirements	WCG	References
Water Entry and Exit/Position of Safety			
Enter water using ramps, steps or side	Demonstrate, independently	WE3	WSIM, Ch8, PSA1
Exit water using ladder, steps, or side	Demonstrate, independently	WX4/5	
Breath Control and Submerging			
Blowing bubbles	Demonstrate, at least 3 seconds	BC3	WSIM, Ch8, PSA1
Submerging mouth, nose and eyes	Demonstrate in shallow water	BC3/4	
Opening eyes under water and retrieving submerged objects	Demonstrate in shallow water	BC3/4	
Buoyancy on Front			
Front glide	Demonstrate, with or without assistance, at least 2 body lengths	BC5, SF3	WSIM, C8, PSA1
Recover from a front glide to a vertical position	Demonstrate, with or without assistance	CBP2/3/4	
Buoyancy on Back			
Back glide	Demonstrate, with *or without* assistance, at least 2 body lengths	SF2/3	WSIM, Ch8, PSA1
Back float	Demonstrate, with *or without assistance*, at least 3 seconds	BF3/4	
Recover from a back float to a vertical position	Demonstrate, with *or without* assistance	BF2, CBP2/3	
Changing Direction and Position and Treading			
Roll from front to back	Demonstrate, with support *or assistance*	CBP2/3	WSIM, Ch8, PSA1; SWS, Ch5
Roll from back to front	Demonstrate, with support *or assistance*	CBP2/3	
Arm and hand treading actions	Explore, in chest-deep water	CBO2/3	
Turn toward pool side	*Explore, with support or assistance*	*CBO2/3*	
Swim on Front			
Alternating leg action	Demonstrate, with support *or assistance*, at least 2 body lengths	SF1/2/3	WSIM, Ch8, PSA1
Simultaneous leg action	Demonstrate, with support *or assistance*, at least 2 body lengths	SF1/2/3	WSIM, Ch8, PSA1
Alternating arm action	Demonstrate, with support *or assistance*, at least 2 body lengths	SF1/2/3	
Simultaneous arm action	Demonstrate, with support *or assistance*, at least 2 body lengths	SF1/2/3	
Combined arm and leg actions on front	Demonstrate, with support *or assistance*, at least 2 body lengths	SF1/2/3	
Swim on Back			
Alternating leg action	Demonstrate, with support *or assistance*, at least 2 body lengths	SB1/2/3	WSIM, Ch8, PSA1
Simultaneous leg action	Demonstrate, with support *or assistance*, at least 2 body lengths	SB1/2/3	
Alternating arm action	Demonstrate, with support *or assistance*, at least 2 body lengths	SB1/2/3	
Simultaneous arm action	Demonstrate, with support *or assistance*, at least 2 body lengths	SB1/2/3	
Combined arm and leg actions on back	Demonstrate, with support *or assistance*, at least 2 body lengths	SB1/2/3	
Water Safety			
Staying safe around aquatic environments	Show and tell		SWS, Ch2 WSIM, Ch4, LWT
Recognizing the lifeguards	Show and tell		
Don't Just Pack It, Wear Your Jacket	Demonstrate		
Recognizing an emergency	Show and tell		
How to call for help	Demonstrate		
Too Much Sun Is No Fun	Show and tell		

Exit Skills Assessment

To further the child's experience of wearing a life jacket in the water and as a lead up to the exit skills assessment, have children practice each exit skills assessment while wearing a life jacket. All Preschool Aquatics Level 1 exit skills can be performed with support, *assistance or independently*. A position of safety could be hanging on the wall or exiting the water.

1. Enter independently [WE2/3], using either the ramp, steps or side (WE2/3), travel at least 2 body lengths [SF1/2/3], submerge to mouth [BC2] and blow bubbles for at least 3 seconds [BC2] then safely exit the water [WE2/3]. (Children can walk, move along the gutter or "swim.")
2. While in shallow water, glide on front at least 2 body lengths [SF1/2/3], then roll to back [CBP1/2/3] and float on back for 3 seconds [BF1/2] recover to a vertical position, [CBP1/2/3] *then travel to a position of safety*.

Preschool Aquatics Level 2 Outline

Equipment

- Submersion items, such as diving rings
- U.S. Coast Guard-approved life jackets in appropriate sizes for children
- Flotation devices, such as foam noodles, kickboards or swim bar floats

Skills	Completion Requirements	WCG	References
Water Entry and Exit/Position of Safety			
Enter water by stepping in from deck or low height	Demonstrate, independently into shoulder-deep water	WE3	WSIM, Ch8, PSA2
After entering, turn around and face the wall (entry pt)	*Demonstrate independently in shoulder-deep water*	*CBO3*	
Exit water using ladder, steps or side	Demonstrate, independently, in chest-deep water	WE4	WSIM, Ch8, PSA1
Breath Control and Submerging			
Bobbing	Demonstrate, independently, at least 5 times	BC4/5	WSIM, Ch8, PSA2 SWS, Ch5
Open eyes under water and retrieve submerged objects	Demonstrate, independently, in chest-deep water	BC5	WSIM, Ch8, PSA2
Buoyancy on Front			
Front glide	Demonstrate, with *or without* assistance, at least 2 body lengths	SF1/2/3; BC5	WSIM, Ch8, PSA2
Front float	Demonstrate, with *or without* assistance, for at least 3 seconds	FF3	
Recover from a front float or glide to a vertical position	Demonstrate, with *or without* assistance, in chest-deep water	CBP1/2/3	WSIM, Ch8, PSA1
Buoyancy on Back			
Back glide	Demonstrate, with *or without* assistance, at least 2 body lengths	BF1/2/3	WSIM, Ch8, PSA1
Back float	Demonstrate, with *or without* assistance, at least 15 seconds	BF3	
Recover from a back float or glide to a vertical position	Demonstrate, with *or without* assistance, in chest-deep water	CBP1/2/3	WSIM, Ch8, PSA2
Changing Direction and Position and Treading			
Roll from front to back	Demonstrate, with *or without* assistance	CBP1/2/3	WSIM, Ch8, PSA2
Roll from back to front	Demonstrate, with *or without* assistance	CBP1/2/3	
Using arm and leg actions	Demonstrate, with *or without* assistance, at least 15 seconds, in shoulder-deep water	CBO2/3	
Turn around	*Demonstrate, with or without assistance*	*CBO2/3*	
Swim on Front			
Combined arm and leg actions on front	Demonstrate, with *or without* assistance, at least 3 body lengths	CMF1/2/4	WSIM, Ch8, PSA1
Swim on Back			
Finning arm action	Demonstrate, with *or without* assistance, at least 3 body lengths	CMB1/2/3	WSIM, Ch8, PSA2
Combined arm and leg actions on back	Demonstrate, with *or without* assistance, at least 3 body lengths	CMB1/2/3	WSIM, Ch8, PSA1
Water Safety			
Staying safe around aquatic environments	Discuss		SWS, Ch2; WSIM, Ch4; LWT
Recognizing the lifeguards	Discuss		
Don't Just Pack It, Wear Your Jacket	Discuss/demonstrate		
Recognizing an emergency	Discuss		
How to call for help	Discuss/demonstrate		
Too much sun is no fun	Discuss		

Exit Skills Assessment

To further the child's experience of wearing a life jacket in the water and as a lead up to the exit skills assessment, have children practice each exit skills assessment while wearing a life jacket. All Preschool Aquatics Level 2 exit skills may be performed with *or without* assistance. A position of safety could be hanging on the wall or exiting the water.

1. Glide on front for at least 2 body lengths (BC4; SF1/2/3), roll to back (CBP1/2/3), float on back for 15 seconds (BF1/3), recover to a vertical position, (CBP1/2/3) *then travel to a position of safety.*
2. Glide on back for at least 2 body lengths (SB1/2/3), roll to front (CBP1/2/3), recover to a vertical position (CBP1/2/3) *then travel to a position of safety.*
3. Swim using combined arm and leg actions on front for at least 3 body lengths (SF1/2/4), roll to back (CBP1/2/3), float on back for 15 seconds (BF1/3), roll to front (CBP1/2/3), continue swimming on front for at least 3 body lengths, (SF1/2/4) *then travel to a position of safety.*

Component Sequence Charts

Water Entry

Water Entry Component Sequence (WE)

If a swimmer demonstrates……	*Then that swimmer may be ready to……*
1. No voluntary entry	• Sit on deck, dangle feet in water, gently splash • Be lifted in by instructor/ caregiver • Climb in over side or walk down steps while holding caregiver or instructor hand
2. Caregiver- or flotation-supported feet-first entry	• Practice getting in and out of pool over the side • Step in while holding caregiver or instructor hand
3. Unassisted voluntary feet-first entry	• Practice different ways to jump in with minimal assistance in both shallow and deeper water • Slide in on stomach with support or assistance

Water Entry (WE) Levels	Possible Games, Songs, Rhymes to Promote WE
No voluntary entry	• Caregiver/Instructor lift into pool or walk in together • Caregiver/child partner sit and slide in
Caregiver- or flotation-supported feet-first entry	• Caregiver/child partner step in holding hands* • "Humpty Dumpty" • "Jack Be Nimble" • Children in the Pool (Tune of "Farmer in the Dell") • Imagination • Caregiver/child partner jump
Unassisted voluntary feet-first entry	• Chop Chop Timber! • Hoop Jumping • Jump and Turn • Jump plus Rocket Ship Launch (push off bottom)

* See *Aquatic Readiness* games

Water Exit

Water Exit Component Sequence (WX)

If a swimmer demonstrates……	*Then that swimmer may be ready to……*
1. Unable to exit water voluntarily	• Be lifted out by instructor/caregiver • Walk up down steps or ramp while holding caregiver's hand • Crawl out in zero depth water
2. Exits water with support of adult	• Practice getting out of pool over the side or up stairs or ramp holding on to railing with assistance by caregiver or instructor • Climb out of pool over the side with minimal caregiver support • Walk up stairs or ramp independently
3. Exits water unsupported (over side, up stairs/ladder or ramp or ladder)	• Explore different ways to climb out of pool at different places in the pool (shallow, deep water, ladders) • Practice feet-first entry into pool, return to side, and exit the water at different parts of the pool

Water Exit (WX) Levels	**Possible Games, Songs, Rhymes to Promote WX**
Unable to exit water voluntarily	• Lift out/walk out together • "Up, up, and away" game with caregiver assist
Exits water with support of adult	• "Turn Around Game" (on deck) • "Up, up, and away" game using noodle or flotation • "Turn Around Game" (in water) • "Up, Up, and Away" game without flotation
Exits water unsupported (over side, up stairs/ladder or ramp or ladder)	• "Rocket ship blast off" in water from side, turn, and back to wall followed by "Up, up, and away game" • "Jump into my circle" followed by turning around, coming back to side and playing "Up, up, and away game"

Breath Control

Breath Control Component Sequence (BC)

If a swimmer demonstrates……	*Then that swimmer may be ready to……*
1. No voluntary submersion attempted	• Mimic face submersion by caregiver; put chin and mouth in water • Play *Magic Candle* w/ finger • Wash face with wet cloth • Practice "*whale spouting*" or blowing bubbles • Wash face • Sprinkle water over the head to acclimate to water
2. Voluntary partial facial submersion (mouth or nose)	• Practice submerging different parts of head
3. Voluntary full face or head submersion	• Prolong submersion to several seconds; do repeated brief submersions
4. Repeated voluntary submersion with momentary breath-holding	• Combine repeated submersions with activities (e.g., walking, bouncing, floating, gliding)
5. Extended (>3 sec) voluntary breath-holding and/or repeated rhythmic breathing with skill	• Practice rhythmic and rotary breathing with various strokes starting w/1 cycle and then add more cycles of stroke

Breath Control (BC) Levels	Possible Games, Songs, Rhymes to Promote BC
1. No voluntary submersion attempted	• Washcloth Play* • It's Raining, It's Pouring* • Look and Listen (Fish Talk)* • Whale spouting* • Bobbing*
2. Voluntary partial facial submersion (mouth or nose)	• Magic Candle* • "London Bridge" • Baby Dolphin
3. Voluntary full face or head submersion	• Pop Goes the Weasel/ Jack in the Box • Treasure Hunt • Flower Garden* • Buddy Bobbing
4. Repeated voluntary submersion with momentary breath-holding	• Treasure Hunt • Water Push Ball • Tea Party • Disappearing Fish Game
5. Extended (>3 sec) voluntary breath-holding and/or repeated rhythmic breathing	• Submarine • Drop the Puck (Water Duck, Duck, Goose) • Charlie Over the Water

* See *Aquatic Readiness* games

Back Buoyancy/Flotation

Back (Supine) Buoyancy/Flotation Component Sequence (BF)

If a swimmer demonstrates……	*Then that swimmer may be ready to……*
1. Back flotation with adult support or flotation device support	• Practice assisted back float w/caregiver or using side • Practice assisted back float with different flotation devices • Practice recovery to vertical to stand up from back float with assist • Brief unsupported back floats (use wall) and recover to vertical (with assist if needed)
2. Momentary (1 to 5 seconds) unsupported voluntary back flotation	• Extend back float to 5+ seconds in various depths of water, w/ & without assist or support
3. Extended (>5 seconds) unsupported voluntary back flotation	• Extend back float with different body inclinations and recover to vertical + roll over without assist

Back Float (BF) Levels	Possible Games, Songs, Rhymes to Promote BF
Back flotation with adult support or flotation device support	• Limbo* – on deck and in water with adult support • Twinkle Twinkle Little Star • The Best Log • In-Water Limbo* (in shallow water or at pool side) • Float like a Boat • Be an airplane or a butterfly and stretch out wings (arms) • Gingerbread Cookie Float
Momentary (1to 5 seconds) unsupported voluntary back flotation	• Airplane • Water Limbo* • "Twinkle, Twinkle Little Star" • Imagination • Merry-Go-Round • Be a leaf floating on a pond • Pretend it is nighttime and quietly count the stars (lights) • Musical Kickboards • Rocket Ship
Extended (>5 seconds) unsupported voluntary back flotation	• Rocket Ship • Log Tag

* See *Aquatic Readiness* games

Front Buoyancy/Flotation

Front (Prone) Buoyancy/Flotation Component Sequence (FF)

If a swimmer demonstrates……	*Then that swimmer may be ready to……*
1. Front flotation with adult or instructional flotation device support	• Practice assisted front float w/caregiver or using side • Practice assisted front float with different flotation devices • Practice assisted recovery to vertical to stand up • Practice brief unsupported front floats (using the wall or bottom) • Recover to vertical (with brief assist as needed)
2. Momentary (1 to 3 seconds) unsupported voluntary front flotation	• Extend the front float to 5+ seconds in various depths of water, with or without assistance • Recover to vertical
3. Extended (>3 seconds) unsupported voluntary front flotation	• Extend front floating with different body inclinations • Recover to vertical + roll over with different kicks and arm actions

Front (Prone) Buoyancy/ Flotation (FF) Levels	**Possible Games, Songs, Rhymes to Promote FF**
Front flotation with adult or instructional flotation device support	• Parent-assisted Airplane* (2 kick boards, or dumbells) • Gingerbread Cookie • Musical Kickboards • Drafting • Rocket Ship • Water Ski Ride • Ride 'em Cowboy (Girl) with noodle*
Momentary (1 to 3 seconds) unsupported voluntary front flotation	• Timber!
Extended (>3 seconds) unsupported voluntary front flotation	• Superman/Super Woman*

* See *Aquatic Readiness* games

Change in Body Orientation

Change in Body Orientation (turning around) **Component Sequence (CBO)**

If a swimmer demonstrates……	*Then that swimmer may be ready to……*
1. Voluntary change in body orientation (turning around) while standing in water	• Practice turning around with adult support and assist
2. Voluntary change in body orientation (turning around) while supported by flotation device	• Turn around toward pool side while using different flotation devices • Turn toward and away from side with minimum assist—may use bottom or side of pool to independently turn around
3. Unsupported voluntary change in body orientation (turning around) while in water	• Practice turning toward and away from side in different directions with no assist for >5-10 sec

Change in Body Orientation (CBO) Levels	**Possible Games, Songs, Rhymes to Promote CBO**
Voluntary change in body orientation (turning around) while standing in water	• Turn Around game (on deck and at side with adult)*
Voluntary change in body orientation (turning around) while supported by flotation device	• Turn Around game (with adult support)* • Do Si Do – Turn Your Partner* • Turn Around game* • Ride 'em Cowboy(girl) – using noodle*
Unsupported voluntary change in body orientation (turning around) while in water	• Hoop Jumping • Jump and Turn

* See *Aquatic Readiness* or other games

Change in Body Position

Change in Body Position (rolling over and/or vertical to horizontal) **Component Sequence (CBP)**

If a swimmer demonstrates……	*Then that swimmer may be ready to……*
1. Adult-supported body position change	Allow a caregiver or instructor to assist moving from: • Back to front and front to back • Stand up from horizontal Use different flotation devices to practice: • Rolling back to front and front to back • Moving horizontal to/from vertical
2. Flotation device-supported body position change	Use shallow water, minimum flotation, or caregiver assist to practice: • Rolling to front, side and back • Moving vertical to/from horizontal
3. Unsupported voluntary change in body position	• Practice front and back flotation for >10 second before changing position • Move from horizontal to/from vertical. Vary from inclined to level

Change in Body Position (CBP) Levels	Possible Games, Songs to Promote CBP
1. Adult-supported body position change	• Wheels on the Bus • Mulberry Bush • Row, Row, Row Your Boat • Pop Goes the Weasel • London Bridge • I'm a Little Pancake* • Did You Ever See A Lassie?
2. Flotation device-supported body position change	• Eggs for Breakfast • Motorboat, Motorboat • London Bridge (with flotation device)
3. Unsupported voluntary change in body position	• Stand up! • Rocket Ship Blast off! • Flip Flop

* See *Aquatic Readiness* games

Swimming on Front

Swimming on Front Component Sequence (CMF)

If a swimmer demonstrates……	*Then that swimmer may be ready to……*
1. Adult-supported front gliding or paddling	• Move in water while holding on to side of pool or with support by caregiver/ instructor
2. Flotation-device supported front gliding, paddling or stroking supported by flotation device	• Practice front paddling either alternating arms or simultaneous arms for short distances assisted by adult
3. Unsupported voluntary front gliding or paddling (2 to 3 body lengths)	• Practice paddling from corner to corner of pool or to side using long push-pull arm paddling on front
4. Unsupported voluntary front paddling or stroking (>3 body lengths	• Practice front swimming with head out or in with some rudimentary rhythmic breathing; arms recovering under or over the water
5. Extended unsupported front paddling or stroking (25 yards)	• Practice swimming on front with rhythmic breathing

Combined Movement on Front (CMF) Levels	**Possible Games and Songs to Promote CMF**
1. Adult-supported front gliding or paddling	• Spider Swimming* • Pop Goes the Weasel • Motorboat (w/ flotation) • London Bridge (w/ flotation) • Alligator Swim (in zero depth pool)*
2. Flotation-device supported front gliding, paddling or stroking supported by flotation device	• Rocket Ship (w/flotation) • Kickboard races (w/ flotation) • Water Ski Ride
3. Unsupported voluntary front gliding or paddling (2 to 3 body lengths)	• Around the Lighthouse • Motorboat, Sailboat, Submarine • Superman (Superwoman)*
4. Unsupported voluntary front paddling or stroking (>3 body lengths)	• Flip Flop • Front Crawl (arm pull cues)*
5. Extended unsupported front paddling or stroking (25 yards)	• One-arm Swim* • Time Machine*

* See *Aquatic Readiness* games

Swimming on Back

Swimming on Back Component Sequence (CMB)

If a swimmer demonstrates……	*Then that swimmer may be ready to……*
1. Adult-supported back gliding or paddling	• Practice back floating and gliding with support
2. Flotation device-supported back gliding, paddling or stroking	• Use their arms + leg kick to move on the back usir various flotation devices and caregiver assist to recover to standing
3. Unsupported voluntary back gliding or paddling (3 to 4 body lengths)	• Push off from side on back and back paddle for 3 t 4 body lengths in inclined or level position with feet making splashes
4. Unsupported back paddling or stroking for >4 body lengths	• Use rudimentary elementary backstroke or back crawl to move >4 body lengths through the water maintaining level body position on back
5. Extended unsupported back paddling or stroking (25 yards)	• Practice swimming on back

Combined Movement on Back (CMB) Levels	**Possible Games and Songs to Promote CMB**
1. Adult-supported back gliding or paddling	• Twinkle Twinkle Little Star • Spider Swimming* • Pop Goes the Weasel • Motorboat (w/ flotation)
2. Flotation device-supported back gliding, paddling or stroking	• London Bridge (with flotation) • Red Light, Green Light • Loud Kicking, Quiet Kicking
3. Unsupported voluntary back gliding or paddling (3 to 4 body lengths)	• Motorboat, Sailboat, Submarine • Battleship (Leaving Port) • Water Fountain Kicking
4. Unsupported back paddling or stroking for >4 body lengths	• Frog in the Sea, You Can't Catch Me! • Imagination
5. Extended unsupported back paddling or stroking (25 yards)	• Around the Lighthouse • Flip Flop

* See *Aquatic Readiness* games

Appendix B: Data Collection Tools

Water Competence Assessment Form
Pre-Participation Caregiver Surveys
Post-Participation Caregiver Surveys

Water Competence Assessment Form

Water Entry Component Sequence (WE)
1. No voluntary entry
2. Adult- or flotation-supported feet-first entry
3. Unassisted voluntary feet-first entry

Water Exit Component Sequence (WX)
1. Caregiver-supported exit to pool side or position of safety
2. Flotation-supported or caregiver-assisted exit to pool side or position of safety
3. Independent exit to pool side or position of safety
4. Independent exit to position of safety and exit from pool (over side, up the stairs or ramp or ladder)

Voluntary Breath Control Component Sequence (BC)
1. No voluntary submersion attempted
2. Voluntary partial submersion of face (i.e., mouth and/or nose)
3. Voluntary full face and/or head submersion
4. Repeated voluntary submersions with momentary breath-holding
5. Extended (i.e.,> 3 sec.) voluntary breath holding and/or repeated rhythmic breathing with skill such as entry or flotation

Back (Supine) Buoyancy/Flotation Component Sequence (BF)
1. Back flotation with adult support or using flotation device support
2. Momentary (1-5 sec.) unsupported voluntary back flotation
3. Extended (>5 sec.) unsupported voluntary back flotation

Front (Prone) Buoyancy/Flotation Component Sequence (FF)
1. Front flotation with adult support or with flotation device support
2. Momentary (1-3 sec.) voluntary front flotation
3. Extended (> 3 sec) voluntary front flotation

Change in Body Orientation (turning around while vertical) **Component Sequence (CBO)**
1. Voluntary change in body orientation (turning around) while standing in water (i.e., touching bottom or side)
2. Flotation device-supported voluntary change in body orientation (turning around)
3. Unsupported voluntary change in body orientation (turning around) while in water

Change in Body Position (rolling over and/or vertical to horizontal) **Component Sequence (CBP)**
1. Adult-supported body position change (rolling over & vertical to horizontal)
2. Flotation device-supported body position change (rolling over & vertical to horizontal)
3. Unsupported voluntary change in body position (rolling over & vertical to horizontal)

Swimming on Front Component Sequence (SF)
1. Adult-supported front gliding or paddling
2. Flotation device-supported front gliding or paddling or stroking
3. Unsupported voluntary front gliding or paddling 2-3 body lengths
4. Unsupported voluntary front paddling or stroking for >3 body lengths
5. Extended unsupported front paddling or stroking for 25 yards

Swimming on Back Component Sequence (SB)
1. Adult-supported back gliding or paddling
2. Flotation device-supported back gliding or paddling or stroking
3. Unsupported voluntary back gliding/paddling 3-4 body lengths
4. Unsupported back paddling or stroking for >4 body lengths
5. Extended unsupported back paddling or stroking for 25 yards

Water Competence (V5) Assessment Profile

Component + # of levels	WE (3)	WX (4)	BC (5)	BF (3)	FF (3)	CBO (3)	CBP (3)	SF (5)	SB (5)
Pre- Level # achieved									
Post- Level # achieved									
Change									

Pre-Participation Parent Survey

Caregiver Demographics

Do you consider yourself to be part of the Hispanic or Latino population?

- ☐ Yes
- ☐ No
- ☐ Prefer not to answer

What race/ethnicity do you consider yourself? *Select one.*

- ☐ White [or European-American]
- ☐ Black [or African-American]
- ☐ American Indian or Alaska Native
- ☐ Asian-American, Native Hawaiian, or Pacific Islander
- ☐ Other (please specify): _____
- ☐ Prefer not to answer

Which of the following includes your TOTAL household annual income in 2021? *Select one.*

- ☐ No income in 2021
- ☐ Less than $15,000
- ☐ $15,000 - $24,999
- ☐ $25,000 - $34,999
- ☐ $35,000 - $44,999
- ☐ $45,000 - $54,999
- ☐ $55,000 - $74,999
- ☐ $75,000 - $99.999
- ☐ $100,000 or more
- ☐ Prefer not to answer

How many people are supported by your household income, including you, your significant other (if you have one), children under your care, and anyone else partially or fully supported by this income whether or not they live with you? _____

How would you rate your own swimming skill level?

- ☐ Non-swimmer
- ☐ Beginner swimmer
- ☐ Intermediate swimmer (comfortable and/or safe in deep water)
- ☐ Advanced swimmer (can swim multiple strokes efficiently)

How many of your children are participating in swim lessons? _____

Child(ren) Names

What is the name of your child that you are taking the survey about (first name, last Initial)? This child will be referred to as Child 1 for this survey.

_____

What is the name of your second child that you are taking the survey about (first name, last initial)? This child will be referred to as Child 2 for this survey.

_____

What is the name of your third child that you are taking the survey about (first name, last initial)? This child will be referred to as Child 3 for this survey.

_____

Child 1's Demographics

What is the name of your child that you are taking the survey about in this section (first name, last Initial)?

_____

What is this child's date of birth? Enter as MM/DD/YYYY: _____

What is this child's gender? *Please circle one.*

Male	Female	Non-binary
Transgender	Other	Prefer not to answer

Do you consider this child to be part of the Hispanic or Latino population?

- ☐ Yes
- ☐ No

What race/ethnicity do you consider this child? *Select one.*

- ☐ White [or European-American]
- ☐ Black [or African-American]
- ☐ American Indian or Alaska Native
- ☐ Asian-American, Native Hawaiian, or Pacific Islander
- ☐ Other (please specify):
- ☐ Prefer not to answer

Continued on the next page

Pre-Participation Parent Survey (continued)

Overall, how would you describe your relationship to this child?

- ☐ Parent
- ☐ Step-parent
- ☐ Legal guardian
- ☐ Grandparent
- ☐ Sibling
- ☐ Other (please specify):

What class is this child participating in?

- ☐ Parent and Child Aquatics (you are required to be in the water with your child during swim lessons)
- ☐ Preschool Aquatics (you are not required to be in the water with your child during swim lessons)

Child 1's Skills

How would you rate this child's swimming skill level?

- ☐ Non-swimmer
- ☐ Beginner swimmer
- ☐ Intermediate swimmer (comfortable and/or safe in deep water)
- ☐ Advanced swimmer (can swim multiple strokes efficiently)

Has this child ever participated in swim lessons before this session?

- ☐ Yes
- ☐ No

If yes, how many classes has this child participated in (in other words, how many days)?

_____

Please select **all** the types of lessons this child has participated in before this session:

- ☐ They have taken swim lessons from a friend or relative.
- ☐ They have taken private swim lessons from a certified swim instructor.
- ☐ They have taken group swim lessons or a swim class from a certified swim instructor.
- ☐ I am teaching them to swim myself.
- ☐ Other (please specify): _____

What types of bodies of water does this child have access to? *Select all that apply.*

- ☐ In-ground residential pool
- ☐ Above-ground residential pool
- ☐ Inflatable/portable pool
- ☐ Neighborhood pool
- ☐ Splashpad
- ☐ Waterpark
- ☐ Pond or lake
- ☐ River or stream
- ☐ Ocean

What types of bodies of water does this child have experience with? *Select all that apply.*

- ☐ In-ground residential pool
- ☐ Above-ground residential pool
- ☐ Inflatable/portable pool
- ☐ Neighborhood pool
- ☐ Splashpad
- ☐ Waterpark
- ☐ Pond or lake
- ☐ River or stream
- ☐ Ocean

Which of the following skills can this child perform in the water without support or assistance from an adult or floatation device? *Select all that apply.*

- ☐ Enter the water
- ☐ Float on front
- ☐ Float on back
- ☐ Submerge and control breathing, such as blowing bubbles or holding their breath
- ☐ Turn around to face different directions
- ☐ Turn over from front to back
- ☐ Paddle on the front
- ☐ Paddle on the back
- ☐ Get to the side of the pool or a place of safety
- ☐ Exit the water

Continued on the next page

Pre-Participation Parent Survey (continued)

As a parent/caregiver, what do you expect to learn during this set of swim lessons? *Select all that apply.*

- ☐ Basic water safety information
- ☐ How to properly supervise and maintain safe behavior around the water
- ☐ How determine my child's readiness to try basic skills and support their learning
- ☐ How to select, properly fit, and use a life jacket
- ☐ How to perform basic water rescue skills, such as reaching and throwing assists
- ☐ **For Parent and Child Aquatics Only:** How and when to use holding and support techniques for my young child
- ☐ Other (please specify: _____

  _____
- ☐ I don't expect to learn these types of information during my child's swim lessons

At the end of these lessons, which of the following skills do you expect that this child will be able to perform in the water without support or assistance from an adult or floatation device? *Select all that apply.*

- ☐ Enter the water
- ☐ Float on front
- ☐ Float on back
- ☐ Submerge and control breathing, such as blowing bubbles or holding their breath
- ☐ Turn around to face different directions
- ☐ Turn over from front to back
- ☐ Paddle on the front
- ☐ Paddle on the back
- ☐ Get to the side of the pool or a place of safety
- ☐ Exit the water

Child 1's Swimming Experience/Comfort Level/Motivation

To what degree did each of the following statements motivate you to enroll this child in swim lessons at this time? *Rate the level of importance for each statement.*

	Important	Neutral	Not Important
I wanted to be a part of this research study.			
I read/saw/heard information about the importance of swim lessons for young children, which prompted me to enroll.			
My child is at the age that I was when I first began swim lessons as a child.			
My friends/peers who have children about the same age as mine have enrolled their children in swim lessons.			
My pediatrician recommended swim lessons for my child.			
I am concerned about the risk of drowning for my child.			
There are classes that suited my family's schedule (example: frequency, daytime vs. nighttime, weekends vs. weekdays).			
There is public transportation to and from the facility.			
There is transportation to and from the facility by the organization offering the lessons.			
It is a more accessible facility (example: means of entry/exit to the facility itself, pool/locker/changing room).			
Facility staff/swim instructors look like me.			
Facility staff/swim instructors speak my language.			
The cost of these swim lessons is affordable.			
There is a welcoming environment at the facility.			
Other reason (please describe):			

Continued on the next page

Pre-Participation Parent Survey *(continued)*

What is your comfort level with enrolling this child in swim lessons?

- ☐ Very comfortable
- ☐ Somewhat comfortable
- ☐ Somewhat uncomfortable
- ☐ Very uncomfortable

For Parent and Child Aquatics Only: As a parent/caregiver, how comfortable are you participating in the swim lessons in the water to help this child learn these skills?

- ☐ Very comfortable
- ☐ Somewhat comfortable
- ☐ Somewhat uncomfortable
- ☐ Very uncomfortable

If you had a choice, which situation would you prefer during this child's swim lessons?

- ☐ I prefer to be in the water with my child during every class session of swim lessons.
- ☐ I prefer to observe poolside so I can see my child at all times during every class session of swim lessons.
- ☐ I prefer to observe swim lessons from bleachers or a designated viewing area.
- ☐ I prefer to closely observe the first few class sessions, but then I am comfortable not having to observe subsequent class sessions.
- ☐ I am comfortable not having to observe my child during swim lessons.

Water Safety Exposure, Behaviors, and Knowledge

What factors would contribute to a higher comfort level with enrolling your young child (1 to 5 years) in swim lessons **in general**? *Select all that apply.*

- ☐ Goals and expectations of each course are clearly defined.
- ☐ The program was developed by a nationally recognized training agency, such as the American Red Cross.
- ☐ Instructors are certified by a nationally recognized training agency, such as Red Cross Water Safety Instructors.
- ☐ Instructors are professional, knowledgeable, engaged, and in the water when teaching.
- ☐ Certified lifeguards are on surveillance duty during all swim lessons.
- ☐ The facility is clean and well-maintained.
- ☐ There is a low instructor-to-student ratio.
- ☐ Instructors communicate regularly and provide progress reports.
- ☐ Children are active and engaged in each lesson and make progress.
- ☐ The facility staff swim lesson instructors look like me.
- ☐ The facility staff/swim lesson instructors speak my language.
- ☐ There are positive recommendations about the facility from people I trust.
- ☐ There are positive recommendations about a specific instructor from people I trust.
- ☐ **For Parent and Child Aquatics Only:** I am able to be an active participant in the water with my child during the lesson.
- ☐ **For Preschool Aquatics Only:** I am able to observe the lessons from a vantage point that allows me to see my child at all times during the lesson.
- ☐ Other reason (please specify): _____

_____

For the purposes of this survey, water safety education means learning about how to prevent drowning, behave safely around the water, and respond to an emergency around water.

Have you learned about water safety as a parent/guardian/caregiver?

- ☐ Yes
- ☐ No

Continued on the next page

Pre-Participation Parent Survey *(continued)*

If yes, through what resources have you learned about water safety? *Select all that apply.*

- ☐ Magazine articles or newspapers
- ☐ Online searches
- ☐ Online courses
- ☐ Mobile apps
- ☐ In-person sessions/classes at an aquatic facility
- ☐ In-person sessions/classes at a location other than an aquatic facility (example: service organizations, places of worship)
- ☐ Health care outlets (example: pediatricians office, health clinic) Through my child's school or daycare
- ☐ Social media
- ☐ Word of mouth through family and friends
- ☐ While participating in swim lessons with my child (example: in a class where in-water participation is required by both you and your child)
- ☐ Pushed to my phone (example: through emails and/or text messages)
- ☐ Other ways (please describe): _____

_____

If no, which of the following have prevented you from learning about water safety as a parent/guardian/caregiver? *Select all that apply.*

- ☐ I've never thought of it before
- ☐ I don't think it's necessary
- ☐ I don't have access to those types of resources
- ☐ I didn't know it was available to me
- ☐ I don't know where to find it
- ☐ It costs too much
- ☐ I feel I already have the necessary knowledge
- ☐ Other reasons (please describe): _____

_____

For each of the following, please indicate if it is something you did or did not do, or if it does not apply to you. *Select one answer for each statement.*

	Yes, I did this	No, I did not do this	This does not apply to me
The last time I went boating, I wore a U.S. Coast Guard-approved life jacket.			
The last time I went to a public pool or beach, I went to a place where there were no lifeguards on duty.			
The last time I went swimming, any weak or inexperienced swimmers wore U.S. Coast Guard-approved life jackets.			
The last time I went swimming with a young child, I stayed within arm's reach of that child at all times whenever he/she was in the water.			
The last time I was with a group of people around the water, such as a pool party at a home pool, a responsible person was designated to constantly watch the activity around the water at all times.			
The last time I bathed a young child, I felt comfortable stepping away once the child was in the water (such as to grab a towel or respond to the needs of another child), as long as I was quick.			
I have taken CPR training within the last 2 years.			

Continued on the next page

Pre-Participation Parent Survey *(continued)*

Which of the following statements do you believe to be true? *Select all that apply.*

- ☐ Inflatable devices, such as water wings, swim rings, and inflatables, are equivalent to U.S. Coast Guard-approved life jackets and can be counted on as lifesaving devices.
- ☐ Drowning is the leading cause of unintentional injury-related death for children ages 1-4 years and second for children ages 5-14.
- ☐ If you see someone in trouble in the water, you should immediately enter the water to get them out.
- ☐ As long as a lifeguard is on duty, it is not necessary for you to maintain constant supervision of children who are in the water.
- ☐ A drowning child splashing and struggling in the water typically makes enough noise to alert someone for help.
- ☐ Any water deep enough to cover the mouth and nose is a potential drowning hazard.
- ☐ One of the best ways to prevent drowning of young children at a home pool is to prevent unsupervised access to the water with barriers, such as fencing.
- ☐ Effective supervision of children around a pool requires total and constant attention to those in the water from a person who knows how to swim and has knowledge of water safety.
- ☐ Children should only enter the water after they have received permission. They should be taught to ask first.
- ☐ When choosing a place to swim, you should choose areas that are protected by lifeguards.
- ☐ Before putting your child in the water for a bath, you should gather everything you will need, such as towels, shampoo, and tub toys, so that you don't step away, even for a moment.

Post-Participation Parent Survey

Post-Participation – Results/Expectations and Water Safety Knowledge

Parent/Guardian Name: _____
Date: _____
Child's Name: _____
Child's Date of Birth: _____

How many sessions did your child attend throughout this study?

Please circle one: Session 1 2 3

How many total classes did your child attending throughout this study?

Please circle one: 1 – 3 classes 4 – 6 classes 7 – 10 classes
11 – 14 classes 15 – 18 classes

After having completed this set of lessons, which skills can your child perform in the water without support or assistance from an adult or a flotation device? *Select all that apply.*

- ☐ Enter the water
- ☐ Float on front
- ☐ Float on back
- ☐ Submerge and control breathing, such as blowing bubbles or holding their breath
- ☐ Turn around to face different directions
- ☐ Turn over from front to back
- ☐ Paddle on the front
- ☐ Paddle on the back
- ☐ Swim to the side of the pool or to a position of safety
- ☐ Exit the water

After having completed this set of lessons, how comfortable are you helping your child learn these skills? *Select one.*

- ☐ Very comfortable
- ☐ Somewhat comfortable
- ☐ Somewhat uncomfortable
- ☐ Very uncomfortable

Which water safety information do you think your child learned during this set of swim lessons? *Select all that apply.*

- ☐ Staying safe around aquatic environments
- ☐ How to recognize the lifeguards
- ☐ When and how to wear life jackets
- ☐ How to recognize an emergency and call for help
- ☐ Sun safety
- ☐ My child didn't learn any of these

Which of the following did you learn during this set of swim lessons? *Select all that apply.*

- ☐ How to properly supervise and maintain safe behavior around water
- ☐ Learn basic water safety information
- ☐ How to determine my child's readiness to try basic skills and support their learning
- ☐ How to select, properly fit and use a life jacket
- ☐ How to perform basic water rescue skills, such as reaching and throwing assists
- ☐ **For Parent and Child Aquatics Only.** How and when to use holding and support techniques for my young child
- ☐ Other (please describe): _____
  _____
- ☐ I did not learn this type of information during my child's swim lessons

How much progress did your child make compared with your expectations? *Select one.*

- ☐ Exceeded expectations
- ☐ Somewhat exceeded expectations
- ☐ Met expectations
- ☐ Somewhat failed to meet expectations
- ☐ Failed to meet to expectations

Do you plan to enroll your child in another session of swim lessons this summer? *Select one.*

- ☐ Yes
- ☐ No

Continued on the next page

Post-Participation Parent Survey *(continued)*

Parent/Guardian Name: _____
Date: _____
Child's Name: _____
Child's Date of Birth: _____

Water Safety Behaviors

For each of the following, please indicate if it is something you did or did not do, or if it does not apply to you. *Select one answer for each statement.*

	Yes, I did this	No, I did not do this	This does not apply to me
The last time I went boating, I wore a U.S. Coast Guard-approved life jacket.			
The last time I went to a public pool or beach, I went to a place where there were no lifeguards on duty.			
The last time I went swimming, any weak or inexperienced swimmers wore U.S. Coast Guard-approved life jackets.			
The last time I went swimming with a young child, I stayed within arm's reach of that child at all times whenever he/she was in the water.			
The last time I was with a group of people around the water, such as a pool party at a home pool, a responsible person was designated to constantly watch the activity around the water at all times.			
The last time I bathed a young child, I felt comfortable stepping away once the child was in the water (such as to grab a towel or respond to the needs of another child), as long as I was quick.			
I have taken CPR training within the last 2 years.			

Water Safety Knowledge

Which of the following statements do you believe to be true? *Select all that apply.*

- ☐ Drowning is the leading cause of unintentional injury-related death for children ages 1 to 4 years and second for children 5 to 14.
- ☐ Children should only enter the water after they have received permission. They should be taught to ask first.
- ☐ If you see someone in trouble in the water, you should immediately enter the water to get them out.
- ☐ Effective supervision of children around a pool requires total and constant attention to those in the water from a person who knows how to swim and has knowledge of water safety.
- ☐ When choosing a place to swim, you should choose areas that are protected by lifeguards.
- ☐ As long as a lifeguard is on duty, it is not necessary for you to maintain constant supervision of children who are in the water.
- ☐ Before putting your child in the water for a bath, you should gather everything you will need, such as towels, shampoo, and tub toys, so you don't step away, even for a moment.
- ☐ A drowning child splashing and struggling in the water typically makes enough noise to alert someone for help.
- ☐ Any water deep enough to cover the mouth and nose is a potential drowning hazard.
- ☐ One of the best ways to prevent drowning of young children at a home pool is to prevent unsupervised access to the water with barriers, such as fencing.
- ☐ Inflatable devices, such as water wings, swim rings and inflatable, are equivalent to U. S. Coast Guard-approve life jackets and can be counted on as lifesaving devices.


Thanks!