MEMORIAL UNIVERSITY

The use of animal-assisted activities by children with Autism in Newfoundland and Labrador

Morag Ryan, MD, MSc
Family Medicine R2

Outline

- Disclosures and funding sources
- Background information
- Research questions
- Objectives
- Methodology
- Results
- Limitations
- Summary
- Future directions

Disclosures and Funding Sources

- No disclosures
- In collaboration with **Dr. Carolyn Walsh**, Department of Psychology
- Not affiliated with the **Autism Society**
- Funding source:
  - **Janeway Foundation Research Fund**
- Project in keeping with the policies of and approved by **ICEHR**

Author Interests

- Prior research in **animal behaviour**
  - MSc in Cognitive and Behavioural Ecology
  - Studied hormones and behaviours of owner-dog dyads
- **Autism advocate**


frontiers in Behavioral Neuroscience

ORIGINAL RESEARCH
published: 23 July 2019
doi: 10.3389/fnbeh.2019.00162

Physiological Indicators of Attachment in Domestic Dogs (*Canis familiaris*) and Their Owners in the Strange Situation Test

Morag G. Ryan[1†], Anne E. Storey[2,3‡], Rita E. Anderson[2] and Carolyn J. Walsh[2*‡]*

[1] Cognitive and Behavioural Ecology Program, Memorial University of Newfoundland, St. John's, NL, Canada, [2] Department of Psychology, Memorial University of Newfoundland, St. John's, NL, Canada, [3] Department of Biology, Memorial University of Newfoundland, St. John's, NL, Canada


Human-Animal Interaction Bulletin
2020, Vol. 8, No. 1, XX-XX

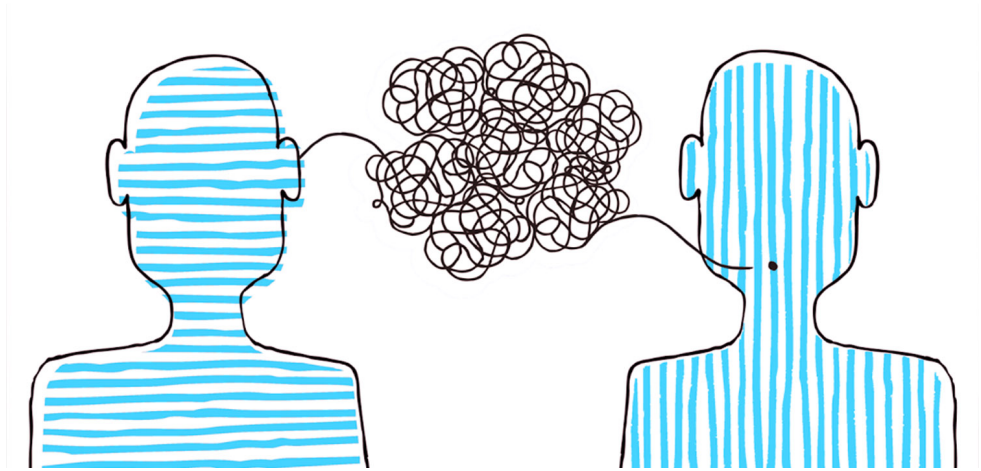
Personality Traits and Owner-Dog Attachment in a Canadian Sample

Morag G. Ryan, Anne E. Storey, Rita E. Anderson, and Carolyn J. Walsh

Memorial University of Newfoundland

Autism Spectrum Disorders (ASD)

- **DSM-5** criteria
- A series of neurodevelopmental disabilities that target
  - **Social engagement**
  - **Communication skills**
- Repetitive/ritualistic behaviors
- Rigidity towards novelty



ARE YOU AUTISM AWARE?

Autism Spectrum Disorders (ASD)

- Common comorbidities include:
  - Obsessive Compulsive Disorder (OCD)
  - Attention Deficit Hyperactivity Disorder (ADHD)
  - Generalized anxiety
  - Learning disabilities
  - Speech/language disorders

Diagnosis of ASD

- **ADOS** → Autism Diagnostic Observation Schedule
  - 1 year until adulthood
  - Series of tasks involving reciprocal social interactions

- **M-CHAT** → Modified Checklist for Autism in Toddlers

What causes ASD?

- Etiology is poorly understood:
  - Teratogens *in utero*?
  - Pregnancy complications?
  - Vaccines?
  - Gut microbiome?
  - Oxytocin deficiencies?
  - Genes?

ASD in Newfoundland and Labrador

- **1 in 57 (1.8%)** youth aged 5-17 y/o have a formal ASD diagnosis in Newfoundland and Labrador (PHAC, 2018)
- Compared to **1 in 66 (1.5%)** across Canada
- Ideal location to further research in this field

Treatment Modalities

- No unifying treatment modality
- ASD is an “umbrella” diagnosis with great variation between individual functional abilities
- Recreational therapy models implemented early-on aid:
  - Language development
  - Social engagement
  - Enhancement of cognitive skills
- Treatment of comorbid conditions (e.g., anxiety)

Animal-Assisted Activities

- Human-animal recreation models have proven efficacy in ASD:
  - Facilitate peer engagement
  - Help overcome sensory aversions
  - Aid in inattention and stress reduction
  - Improve emotional wellbeing
  - Provide unconditional companionship

Research Questions

- What are the current attitudes in NL regarding animal-assisted therapies for ASD?
- Are there any barriers to obtaining animal-assisted activities?
- What resources are presently available in NL?

Objectives

- To conduct a needs assessment in NL of animal-assisted activities for children with ASD
- To assess current utilization of services in NL
- To identify barriers in the provision of such services
- To investigate global interest in animal-assisted activities

Methods

Survey

- We conducted a **73 question** survey to assess the need, interest and use of animal-assisted therapies in NL for children with ASD
- Target demographic:
  - **6-17 y/o**
  - Diagnosis of **Autism Spectrum Disorder**
  - Residents of **Newfoundland and Labrador**

Survey

- Qualtrics platform: https://www.mun.ca/surveysolution/
- Some questions derived from **Christon *et al.* (2020)**
- Likert scales, multiple choice and qualified statements
- Use/interest regarding animal-assisted activities
  - Guide dogs, organized activities and pet ownership
- Demographic information
- Domains of perceived changes

Research in Autism Spectrum Disorders
Volume 4, Issue 2, April–June 2010, Pages 249-259

Use of complementary and alternative medicine (CAM) treatments by parents of children with autism spectrum disorders

Lillian M. Christon [a], Virginia H. Mackintosh [b, 1], Barbara J. Myers [a, 2]

Show more

https://doi.org/10.1016/j.rasd.2009.09.013

* Integral in the assessment of Animal-Assisted therapies efficacy

Christon *et al.* (2010)

- Looked at the use of contemporary and alternative medicine (CAM) use in ASD
- Addressed parental perceived efficacy via questionnaire
- Parents in favor of CAM's, including animal therapy
- Failed to evaluate how they were using these services
- Difficulties assessing "improvement" and lacked specific quantifications (e.g., social engagement, communication, etc.)

Advertisement

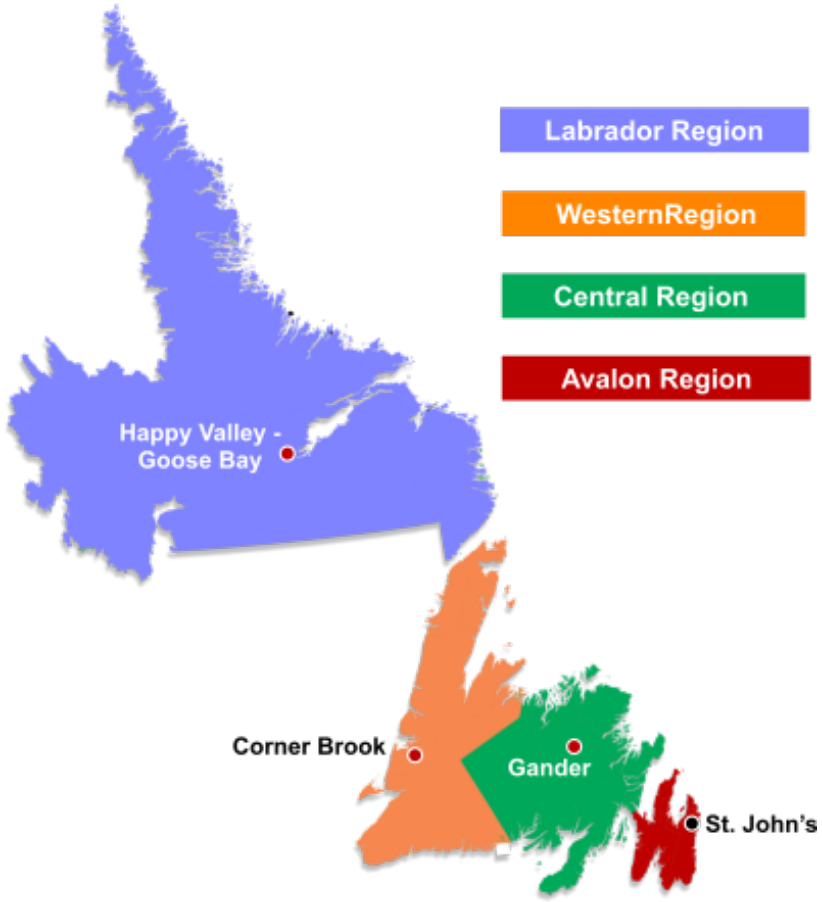
- Impacted by COVID-19 pandemic
- Predominantly advertised through:
  - Listservs
  - Posters
  - Social media (Facebook, Twitter, and Instagram)
  - Word of mouth

Statistical Analysis

- Anonymized data was extracted from Qualtrics
- Descriptive statistics provided by the platform

Results

Geographic Distribution



- Eastern Newfoundland: **30**
- Central Newfoundland: **4**
- Western Newfoundland: **3**
- Labrador: **5**

*16.67% would consider themselves rural or remote

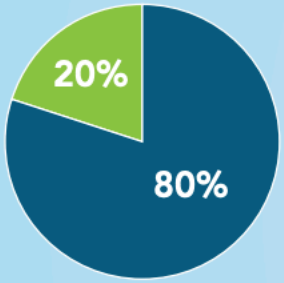
Age and Gender

- **43** respondents in total
- Average age: **10.7 y/o** +/- 3.1
  - Range: 6-16 y/o
- Gender:
  - Cis-male: *N*=**32**
  - Trans-male: *N*=**1**
  - Cis-female: *N*=**10**

*No self-identified trans-female respondents

Diagnosis

- ***N*=42** with a **formal diagnosis** and ***N*=1** awaiting formal diagnosis
- **83.3%** had an **ADOS** performed (*N*=35)
- **11.9%** (*N*=5) received a diagnosis from a doctor without an ADOS
- Average age of diagnosis: **4.2 y/o** +/- 3.1
  - Earliest : **2 y/o**
  - Latest : **15 y/o**



MALES WERE IDENTIFIED WITH **ASD** MORE FREQUENTLY THAN **FEMALES**

4X

MORE THAN HALF OF CHILDREN AND YOUTH HAD RECEIVED THEIR DIAGNOSIS BY AGE **6**

56%

AND MORE THAN 90% OF CHILDREN AND YOUTH WERE DIAGNOSED BY AGE **12**

90%

1 IN 42
MALES
WERE DIAGNOSED WITH **ASD**

1 IN 165
FEMALES
WERE DIAGNOSED WITH **ASD**

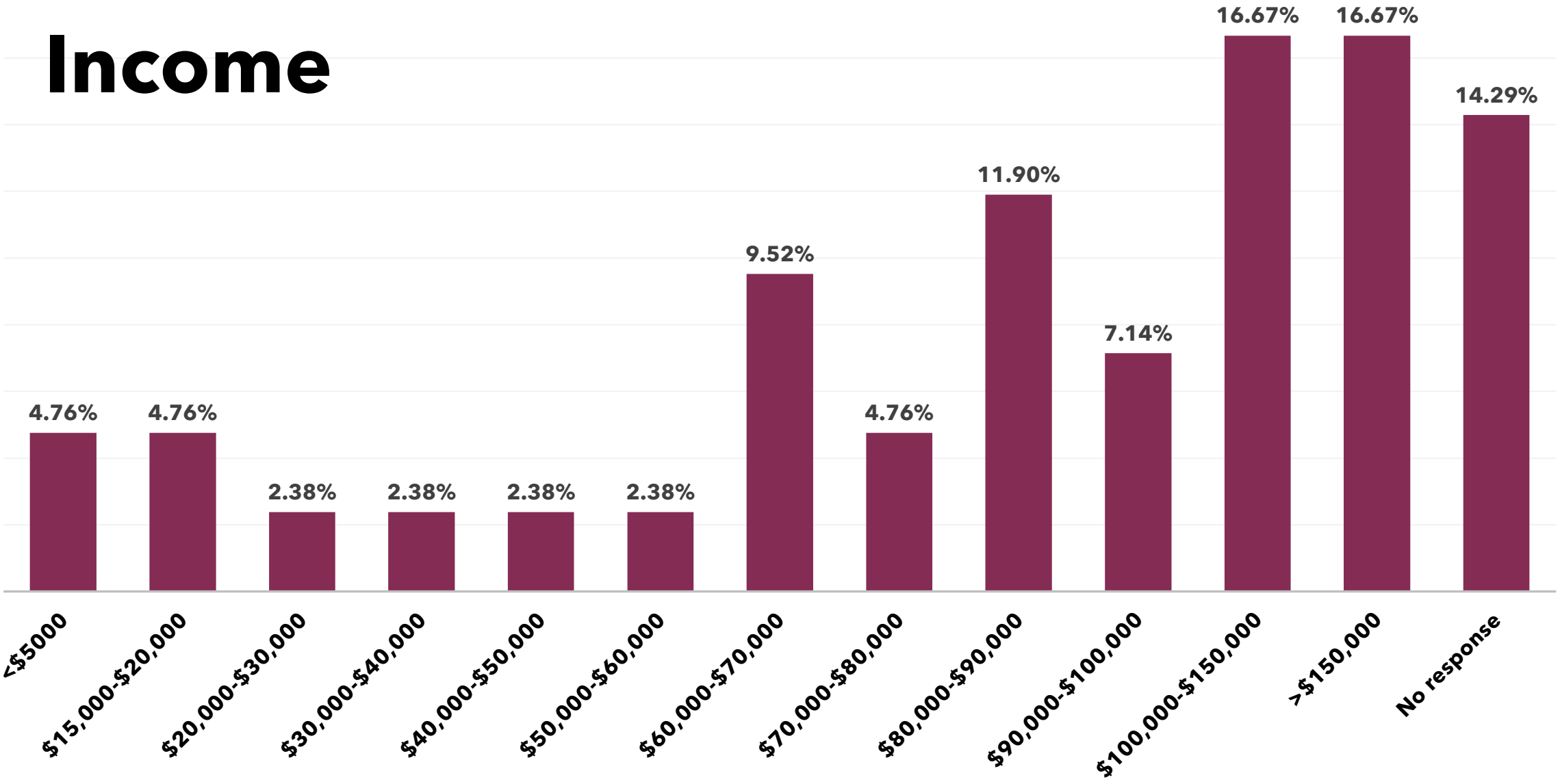
Family Dynamics

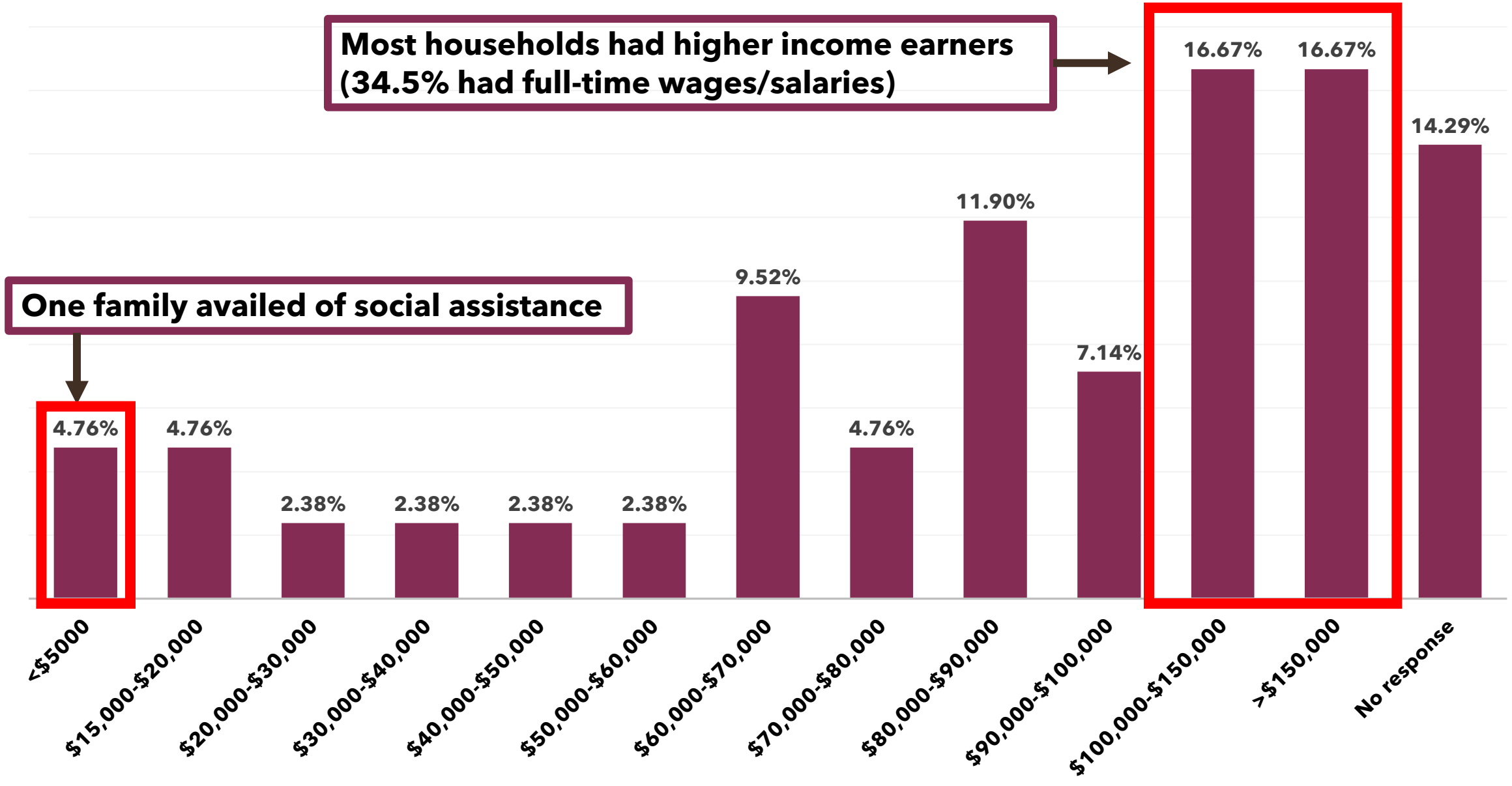
- Of the **29** participants that had siblings, **24.1%** (*N*=7) had another child with ASD living in their home
- **7** were only children

Family Dynamics

- **32** lived in dual parent households
- **7** lived in single parent households
- **2** had stepparents
- **1** coparenting in the same household (separated)
- **1** was living in foster care

Income


4.76%
4.76%
2.38%
2.38%
2.38%
2.38%
9.52%
4.76%
11.90%
7.14%
16.67%
16.67%
14.29%
<$5000
$15,000-$20,000
$20,000-$30,000
$30,000-$40,000
$40,000-$50,000
$50,000-$60,000
$60,000-$70,000
$70,000-$80,000
$80,000-$90,000
$90,000-$100,000
$100,000-$150,000
>$150,000
No response


Most households had higher income earners
(34.5% had full-time wages/salaries)
One family availed of social assistance
4.76%
4.76%
2.38%
2.38%
2.38%
2.38%
9.52%
4.76%
11.90%
7.14%
16.67%
16.67%
14.29%
<$5000
$15,000-$20,000
$20,000-$30,000
$30,000-$40,000
$40,000-$50,000
$50,000-$60,000
$60,000-$70,000
$70,000-$80,000
$80,000-$90,000
$90,000-$100,000
$100,000-$150,000
>$150,000
No response

Program Structure

- Individual-based: **71.4%**
- Group-based: **28.6%**
  - **57.1%** encouraged peer-peer interaction
  - **28.6%** did not facilitate peer interactions
  - **14.3%** did not know

Support Workers

- **39.10%** (N=10) had a support worker
  - Respite worker
  - ABA therapist
  - Home support worker
  - OT
  - School supports
  - Followed by a developmental pediatrician or therapist

Pet Ownership

- Globally participants did not prefer pets to peers
  - Peer < Pet → **22.6%**
  - Peer > Pet → **25.8%**
  - Equal → **29.0%**
  - Unsure → **22.6%**

Pet Ownership

- Parent participants stated that children did not prefer pets to peers
- **54.8%** said pets were their best friends
- **68.0%** turned to their pets for comfort
- **77.41%** turned to their pets for companionship

Comorbidities

- **ADHD (*N*=14)**
- Asthma (*N*=1)
- **Depression (*N*=1)**
- OCD (*N*=2)
- **Anxiety (*N*=7)**
- **Speech apraxia (*N*=1)**
- ODD (*N*=2)
- **Learning disability (*N*=3)**
- Epilepsy (*N*=2)
- Hypothyroidism (*N*=1)
- Visual impairment (*N*=1)

Pet Ownership

- **73.8%** (*N*=31) owned a pet:
  - **Cats** (*N*=19)
  - **Dogs** (*N*=16)
  - Reptiles (*N*=2)
  - Fish (*N*=3)
  - Rabbits (*N*=3)
  - Rodents (*N*=1)

**Only 7.1% reported pet allergies*

Animal-Assisted Activities

- Only **7 participants** were involved in formal animal-assisted therapies
- Involvement stimulated by:
  - Physicians (*N*=1)
  - Autism society (*N*=4)
  - Peers (*N*=2)
  - Personal research (*N*=2)
  - Guided by child's interest (*N*=1)

Animal-Assisted Activities

- **92.9%** felt that NL would benefit from animal-based therapies
- **76.2%** said they would use them if they were free
- **7.1%** would never use them and **7.1%** were undecided
- Activities available in the province (not exhaustive):
  - Rainbow Riders
  - Spirit Horse
  - St. John Ambulance Therapy Dogs

#	Field	Much worse	Mildly worse	No change	Mildly better	Much better	I don't know
1	Social extraversion	0.00% 0	0.00% 0	71.43% 5	0.00% 0	28.57% 2	0.00% 0
2	Confidence	0.00% 0	0.00% 0	0.00% 0	57.14% 4	42.86% 3	0.00% 0
3	Self-esteem	0.00% 0	0.00% 0	14.29% 1	14.29% 1	71.43% 5	0.00% 0
4	Stress	0.00% 0	12.50% 1	0.00% 0	12.50% 1	75.00% 6	0.00% 0
5	Language skills	0.00% 0	0.00% 0	71.43% 5	0.00% 0	28.57% 2	0.00% 0
6	Play behaviours	0.00% 0	0.00% 0	57.14% 4	14.29% 1	28.57% 2	0.00% 0
7	Ritual behaviours	0.00% 0	0.00% 0	71.43% 5	0.00% 0	28.57% 2	0.00% 0
8	Sensory aversion	0.00% 0	0.00% 0	71.43% 5	14.29% 1	14.29% 1	0.00% 0
9	Aggression	14.29% 1	0.00% 0	42.86% 3	0.00% 0	42.86% 3	0.00% 0
10	Family bonding	0.00% 0	0.00% 0	57.14% 4	28.57% 2	14.29% 1	0.00% 0
11	Mood	0.00% 0	0.00% 0	28.57% 2	0.00% 0	71.43% 5	0.00% 0

Domains of perceived change after animal activities.			
Domain	Worse %	Neutral %	Better %
Social extraversion	-	71.4	28.6
Confidence	-	-	100
Self-esteem	-	14.3	85.7
Stress	14.3	-	85.7
Language skills	-	71.4	28.6
Play behaviours	-	57.1	42.9
Ritual behaviours	-	71.4	28.6
Sensory aversion	-	71.4	28.6
Aggression	14.3	42.9	42.9
Family bonding	-	57.1	42.9
Mood	-	28.6	71.4

Domains of Perceived Change

- The most improvement was seen in:
  - **Confidence (7/7)**
  - **Self-esteem (6/7)**
  - **Stress reduction (6/7)**
- One participant found ↑ aggression during activities
- One participant found ↑ stress during activities

Domains of Perceived Change

- Participants did not report change in:
  - Social extraversion
  - Language skills
  - Play Behaviours
  - Ritual Behaviours
  - Sensory Aversion
  - Family Bonding

Barriers to Access

- Involvement in animal-therapies seemed to be impacted by:
  - Not aware (*N*=19; **45.2%**)
  - Personal preference (*N*=11; **26.2%**)
  - Not available (*N*=7; **16.7%**)
  - Cost prohibitive (*N*=5; **11.9%**)

Sample Narratives: Benefits

- *"…animal interaction, whether in a formal setting like horse therapy or an informal setting like visiting a friend with a dog or cat, brings out a **calm and patient side** that is rarely seen in other activities…"*

- *"Since starting horse therapy … I notice a much greater **improvement in social skills, patience and empathy**, without the typical frustration/aggression associated with all other learning environments…"*

Sample Narratives: Benefits

- *"My child is **completely different around animals**. She barely talks but can carry on a conversation about animals for hours and is quite knowledgeable. She watches all vet shows and plans to be a vet assistant or animal groomer".*

Sample Narratives: Access

- *"I believe every child has a right to some sort of assistance.... Animals, **should almost be a basic right** for these children."*

- *"AUTISM service dogs **require an intellectual disability**. We find this to be ridiculous since Autism is a developmental disability."*

Sample Narratives: Interest

- *"There is an **overwhelming need** for both service animals and also animal assisted programs for children with Autism. **We would strongly support and regularly avail of** any animal assisted programs that were available in our area, given it was not cost-prohibitive."*

Sample Narratives: Risks

- *"My son is extremely scared of dogs. He **does not like them** barking, licking, or jumping up on him."*

**Important to consider sensory aversions in this population (reported by N=31)*

Discussion

- Family dynamics influences coping strategies of families, but also ability to invest time or finances into animal-based therapies
- Access to these therapies is partially cost-prohibitive, but also not readily available in NL
- Animals appear to have perceived benefits in multiple domains
- Families reported interest in such activities

Limitations

- Majority of cohort had a higher SES
- Relatively small sample size of AAA users (N= 7 of *N*=43)
- Small representation of rural communities
  - Less access (geographically) to programs and training facilities
- Difficulties reaching target demographic

Animal-Assisted Therapy Options

- Untrained pets
- Spirit Horse
- Rainbow Riders
- St. John Ambulance therapy dogs
- Autism Service Dogs Inc.
- BC and AB Guide Dog Services
- Canadian Guide Dogs for the Blind
- National Service Dogs
- COPE Service Dogs
- Dogs with Wings Assistance
- Dog Society
- Lions Foundation of Canadian Dog Guides
- MIRA Foundation Inc.
- Training Centre, Inc.
- Pacific Assistance Dogs Society

Summary

- Autism is an “umbrella diagnosis” with substantial inter-person variability
- It is important to consider variable tolerance in this population towards animals (e.g., sensory aversions)
- Most stated that animal-based activities would be beneficial to NL
- Obvious barriers to acquiring services (financial, availability and access)
- Participants claimed efficacy of AAA through lived experiences

Future Directions

- **Deidre Murphy** (Psychology Honours student) will perform a qualitative analysis from personal narratives collected
- Abby De Boer Vanderkloet's honours thesis instrumental in launching survey and working on a public report of these findings
- Physiological basis to explain domains of perceived change (salivary oxytocin)
- Communicate findings to provincial government and interested parties

Knowledge Translation

- ASD generally presents first in family practice
- As family physicians we need advocate for resources
- Clinically relevant to NL due to high prevalence
- Consider suggesting AAA to families

Acknowledgements

Dr. Carolyn Walsh

Dr. Ken Fowler

Abby De Boer Vanderkloet

Dierdre Murphy

Janeway Research Foundation

To those who distributed/advertised our study!

STUDY ON PETS & ANIMAL-ASSISTED ACTIVITIES

MEMORIAL UNIVERSITY

Are you the parent of a child with Autism Spectrum Disorder?

We are inviting parents/guardians of children aged 6-17 years old with a diagnosis of Autism Spectrum Disorder in Newfoundland & Labrador to participate in a survey about their family's interest in and use of animal-assisted activities, including pets and service animals. This survey is not affiliated with nor is it a requirement of the Autism Society.

Participation is anonymous and will take about 20 minutes of your time. Access the on-line survey at (https://bit.ly/2U3pNKC) or scan the Q-R code below. For further information, contact Dr. Morag Ryan (morag.g.ryan@mun.ca) or Dr. Carolyn Walsh (carolynw@mun.ca).

The proposal for this research has been reviewed by the Interdisciplinary Committee on Ethics in Human Research and found to be in compliance with Memorial University's ethics policy. If you have ethical concerns about the research, such as your rights as a participant, you may contact the Chairperson of the ICEHR at icehr.chair@mun.ca or by telephone at 709-864-2861.

We are still in active recruitment!

References

1. Andari, E., Duhamel, J. R., Zalla, T., Herbrecht, E., Leboyer, M., & Sirigu, A. (2010). Promoting social behavior with oxytocin in high-functioning autism spectrum disorders. *Proceedings of the National Academy of Sciences*, *107*, 4389-4394.
2. Autism Society of Newfoundland and Labrador. (2015). Needs assessment survey Autism community, Newfoundland and Labrador. Retrieved from: https://www.autism.nf.net/wp-content/uploads/2017/01/ASNL-Needs_Assessment_FINAL_SC.pdf
3. Bass, M. M., Duchowny, C. A., & Llabre, M. M. (2009). The effect of therapeutic horseback riding on social functioning in children with autism. *Journal of Autism and Developmental Disorders, 39,* 1261-1267.
4. Christon, L. M., Mackintosh, V. H., & Myers, B. J. (2010). Use of complementary and alternative medicine (CAM) treatments by parents of children with autism spectrum disorders. *Research in Autism Spectrum Disorders*, *4*, 249-259.
5. Crossman, M. K., & Kazdin, A. E. (2016). Additional evidence is needed to recommend acquiring a dog to families of children with autism spectrum disorder: A response to Wright and colleagues. *Journal of Autism and Developmental Disorders*, *46*, 332-335.
6. Funahashi, A., Gruebler, A., Aoki, T., Kadone, H., & Suzuki, K. (2014). Brief report: the smiles of a child with autism spectrum disorder during an animal-assisted activity may facilitate social positive behaviors–quantitative analysis with smile-detecting interface. *Journal of Autism and Developmental Disorders*, *44*, 685-693.
7. Mazzone, L., Ruta, L., & Reale, L. (2012). Psychiatric comorbidities in asperger syndrome and high functioning autism: diagnostic challenges. *Annals of general psychiatry*, *11*, 16.
8. Morrison, M. L. (2007). Health benefits of animal-assisted interventions. *Complementary Health Practice Review, 12*, 51–62
9. Nimer, J., & Lundahl, B. (2007). Animal-assisted therapy: A meta-analysis. *Anthrozoös, 20*, 225-238.
10. Pavlides, M. (2008). Animal-assisted interventions for individuals with autism. Jessica Kingsley Publishers.
11. Wells, D. L. (2009). The effects of animals on human health and wellbeing. *Journal of Social Issues*, *65*, 523–543.
12. Wijker, C., Leontjevas, R., Spek, A., & Enders-Slegers, M. J. (2019). Effects of Dog Assisted Therapy for Adults with Autism Spectrum Disorder: An Exploratory Randomized Controlled Trial. *Journal of Autism and Developmental Disorders.* Retrieved from: https://link-springer-com.qe2a-proxy.mun.ca/article/10.1007/s10803-019-03971-9
13. https://www.canada.ca/content/dam/phac-aspc/documents/services/publications/diseases-conditions/infographic-autism-spectrum-disorder-children-youth-canada-2018/infographic-autism-spectrum-disorder-children-youth-canada-2018.pdf


Autism
Syndrome
Disorder
Abilities
Aspergers
Diagnosis
Intelligence
Education
Behavior
Child
Support
Criteria
Communication
Girls
Biology
Family
Gifted
Equality
Factors
Genetic
Environmental
Development
Genetics
Kids
Causes
Care
Condition
Difference
Community
Difficulty
Disability
Boys
Heritable
Awareness
Diagnose
Gradually
Cognitive
Literacy
Brain
Mental
Gesture
Impaired
Language
Infant
Learning
Hope
Help
Disease
Regress
Nonverbal

Questions?