1-1-2019

So You Think You Can Exercise: The Gap Between Exercise Confidence And Physical Activity Among Samoan Adults

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Master of Public Health
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Year Completed: May 1st, 2019
Year Degree Awarded: 2019

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Abstract

Samoa is experiencing one of the highest prevalence of overweight and obesity in the world, placing its population at increased risk of developing several noncommunicable diseases including type 2 diabetes and cardiovascular disease. The role of physical activity in reducing the burden of these diseases and overweight is well-established. Exercise self-efficacy or confidence is a predictor, if not determinant, of recreational physical activity. The purpose of this study, therefore, is to assess the relationship between exercise confidence and levels of recreational physical activity among Samoan adults. We confirm that exercise confidence is correlated with time spent exercising. However, despite considerable spread in exercise confidence scores, participation in recreational physical activity is extremely limited. Social support may mediate the association between confidence and activity. The results suggest that a considerable share of the population reports high levels of confidence in their ability to engage in exercise, but this is not translating into actual physical activity. Other barriers to exercise need to be addressed among this group. Conversely, a large group also report low levels of confidence, indicating the potential for interventions promoting exercise self-efficacy as a way to increase participation in exercise.

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Introduction

The increasing burden of non-communicable diseases (NCDs), driven by the globalization of unhealthy lifestyles, rapid urbanization and the ageing of populations, now accounts for 71% of all deaths globally (World Health Organization, 2018a). The majority of these deaths can be attributed to cardiovascular diseases, cancers, chronic respiratory diseases, and diabetes (World Health Organization, 2018b). Low- and middle-income countries experience a disproportionate burden, accounting for 85% of deaths due to NCDs (World Health Organization, 2018a). Overweight and obesity are of particular concern given their comorbidity with adverse conditions including cancer, coronary heart disease, type 2 diabetes mellitus, and stroke, among others (Caballero, 2007). Worldwide, 39% of adults had overweight or obesity in 2016, a figure that has tripled since 1975 (World Health Organization, 2018c).

The Pacific Island region in particular has experienced a rapid transition in patterns of diet and physical activity that has propelled the increasing rates obesity (World Health Organization for the Western Pacific Region, 2007). In Samoa, a growing share of the population of 195,979 is shifting from rural to urban living (Samoan Bureau of Statistics, 2016), and there has been proliferation of modern food retailers serving items high in added sugars, refined carbohydrates and animal products (DiBello et. al., 2009; Popkin, 2015). Samoa experiences among the highest prevalence of obesity in the world, and data from 2013 estimated that 53% of males and 77% of females have obesity (Lin et. al., 2017). Mirroring the burden of obesity are the high rates of diabetes and metabolic syndrome (Galanis et. al., 1995; Tsai et. al., 2005; McGarvey et. al., 2001). Dietary patterns have been associated with metabolic outcomes, and studies in Samoa indicate that neo-traditional and mixed-modern diets are

inversely associated with metabolic syndrome while modern diets are associated with a higher prevalence of metabolic syndrome (DiBello et. al., 2009; Wang et. al., 2017; Baylin et. al. 2013).

A decrease in occupation-related and transportation-related physical activity has accompanied the consumption of unhealthy diets globally and in the Pacific Island Region (World Health Organization for the Western Pacific Region, 2008). This trend is alarming considering the well-established health benefits of physical activity on reducing risk of NCDs including cardiovascular diseases and diabetes. In fact, lack of sufficient physical activity, defined by WHO as at least 150 minutes of moderate-intensity per week, not only contributes to the development of NCDs, but is also the fourth leading driver of mortality and morbidity globally (World Health Organization, 2009; Warburton et. al., 2006). In Samoa, country-wide representative data are not available for the rates of physical activity, but a study in the urban area of Apia reported that 68% of residents were not getting at least 30 minutes of physical activity daily (Tuagalu, 2011). These data suggest that there is considerable opportunity for addressing rates of NCDs in Samoa by increasing participation in physical activity. However, there are several barriers to engaging in physical activity, including "lack of time, convenience, lack of infrastructure, low motivation, low confidence, lack of enjoyment, boredom, lack of self-management skills, fear of being injured and lack of support" (Heard, Auvaa & Conway, 2017).

Exercise self-efficacy, which describes an individual's confidence in their ability to engage in physical activity in particular situations, is one of the strongest correlates of physical activity in adults (Bauman et. al., 2012). Several studies of physical activity initiation and maintenance in high-income countries suggest that self-efficacy is a determinant of initiation but may be less salient in maintenance (Trost et. al., 2002; Plonczynski, 2003; Van Stralen et. al.,

2009). This relationship between belief in one's own capabilities and likelihood of adopting various exercise behaviors has been observed in groups with varying age ranges and health status (McAuley & Blissmer, 2000). In light of high levels of overweight and obesity, low levels of physical activity among the Samoan population, and the role of exercise-related self-efficacy in participation in physical activity, the present study aims to characterize levels of physical activity and exercise confidence in a sample of Samoan adults.

Methods

Study Participants

Participants included in this analysis were purposively recruited to study genetic and environmental influences on adiposity and cardiometabolic health. Each of the 517 participants who were enrolled into the '*Soifua Manuia'* (Good Health) study, had previously participated in a 2010 genome-wide association study (GWAS) (Hawley et al., 2014) and were selected for participation in this follow-up study based on the presence or absence of a gene variant known to influence both obesity and diabetes risk (Minster et al., 2016). The original eligibility criteria for the GWAS study included being of Samoan ethnicity (which was determined by having four Samoan-grandparents [self-reported]), being 24.5 to <65 years of age, non-pregnant, and with no physical or cognitive impairment that would prohibit completion of study procedures.

Participants selected for enrollment in the *Soifua Manuia* study were recruited between July 2017 and August 2019 from 24 villages on the island of Upolu (9 urban, 7 peri-urban, and 8 rural). Seven to nine years after their original participation, subjects ranged in age from 30.8 years to 72.8 years. The same inclusion criteria applied: based on their GWAS data, those

selected for participation in the follow up study were genetically Samoan, and pregnant women were excluded, as were those who had developed physical or cognitive impairments preventing full participation in study procedures. Unlike the earlier GWAS, which had over-recruited women and those from rural villages (Hawley et al., 2014), the *Soifua Manuia* study aimed for a sample that was sex-balanced and used maximum kinship estimates (GenABEL; Aulchenko et al., 2007) to ensure that participants were only minimally related to one another (maximum kinship estimate 6.01%; less than first cousins).

Recruitment and Study Procedures

After government- and village-level permissions were granted, Samoan research assistants used phone calls and home visits to contact participants. During visits to participants' homes, research assistants provided detailed information about the purpose of the study and its protocols and gained written, informed consent from all participants.

If participants consented to participation, they completed a number of assessments during the recruitment visit including questionnaires (demographic characteristics, health history, cigarette and alcohol consumption, socioeconomic status, physical activity, and food frequency questionnaires); measurements of height (SECA 213 portable stadiometer, SECA, CA, USA) and weight (Tanita HD 351 digital scale, Tanita Corporation of America, IL, USA) for calculation of body mass index (BMI; kg/m^2); finger-stick blood hemoglobin (AimStrip Hb test system, Germaine Laboratories Inc., TX, USA); and blood pressure (Omron HEM 907 XL, Omron, IL, USA). At the completion of the recruitment assessment, participants were scheduled for a laboratory visit approximately seven days later. During the laboratory visit, participants

completed several other study activities including additional questionnaire measures, physical assessments (skinfold thicknesses, circumferences, hand grip strength), body composition measurements (bioelectrical impedance and dual-energy x-ray absorptiometry) and an oral glucose tolerance test.

Outcome: Physical Activity

The physical activity questionnaire was administered during the initial recruitment visit before participants were exposed to physical measurements of height and weight or questionnaires about exercise confidence, body image, and weight stigma during the laboratory visit in an effort to avoid response bias. Physical activity was measured through self-report using the World Health Organization (WHO) Global Physical Activity Questionnaire (GPAQ), which collects information on physical activity participation in three domains: activity at work, travel to and from places, and recreational activity (Appendix A). It additionally stratifies these domains by moderate and vigorous activity. Examples of moderate activities include brisk walking and carrying light loads, while vigorous intensity activities include running and heavy lifting. Participants were asked to report the number of days per week and number of minutes on a typical day spent participating in moderate and vigorous physical activity that lasted for more than 10 minutes at a time. If they responded "yes" to the item "Does your work involve mostly sitting or standing, with walking for no more than 10 mins at a time?" then they were coded as "0" for days and minutes of work-related moderate and vigorous activity. A similar item was asked for both travel- and recreation-related activity.

The GPAQ Analysis Guide (World Health Organization) was used to clean and categorize the data into four outcome variables: percentage of respondents not meeting WHO guidelines on physical activity of at least 600 MET-minutes per week, percentage with zero minutes of work-related physical activity on an average day, percentage with zero minutes of travel-related physical activity on an average day, and percentage with zero minutes of recreation-related physical activity on an average day. MET is the ratio of working metabolic rate relative to the resting metabolic rate defined as the energy cost of sitting quietly. The GPAQ analysis utilizes the estimate that compared to sitting quietly, energy expenditure is four times as high during moderate activity, and eight times as high during vigorous activity. Accordingly, to calculate MET-minutes per week, minutes of moderate activity were multiplied by a factor of four and vigorous activity by a factor of eight, where travel-related activity was considered moderate.

The analysis guide requires participants reporting greater than 16 hours for any one sub-domain (vigorous work, moderate work, transport, vigorous recreation, or moderate recreation activity) or reporting implausible values (e.g. >7 days), to be removed from all analyses. However, the present data did not include invalid values. If any one of the sub-domains had a missing value, the total MET-minutes per week could still be calculated. There were no missing values for the work-related domains, 11 missing for the travel domain, and 4 missing for recreation-related domains. The primary outcome variable was the percentage of participants reporting zero minutes of recreational physical activity on a typical day. Due to the lack of variation in responses to recreational activity, this measure could not be coded as a non-dichotomous categorical variable or treated as a continuous variable.

Predictor: Exercise Confidence

The Exercise Confidence Survey, a 12-item survey assessing physical activity self-efficacy, was utilized (Sallis et. al., 1988; Appendix B) and administered at the laboratory visit. It consists of 12 statements of things people might do while trying to increase or continue regular exercise. Whether participants exercised or not, they were asked to rank on a Likert scale from 1 ("I know I cannot") to 5 ("I know I can") their confidence in their ability to motivate themselves to do the tasks stated consistently, for at least six months. If any one of the 12 items were missing (n=33), the total score, which was the mean value of the 12 items, could not be calculated. The Exercise Confidence Survey can be broken down into two factors, namely "making time" and "sticking to it." The making time subscale consists of items 1 ,4, 7 and 12 while sticking to it consists of 2, 3, 5, 6, 8, 9, 10, and 11. The original scale does not offer guidelines on categorization of the mean scores, so the predictor variables of total exercise confidence, making time, and sticking to it were categorized in the current study using cutoffs driven by the sample data. Mean scores that were $\geq$1 but <2 were categorized as low confidence, $\geq$2 but <4 as moderate confidence, and $\geq$4 but $\leq$5 as high confidence.

Covariates

A secondary goal of this study was to characterize exercise confidence and physical activity by a number of covariates. Information on age, sex, marital status, relationship to the head of household, education level, employment status, and income was collected at the initial recruitment visit. Age was determined using the participants' date of birth and categorized in

10-year increments into four levels: 30-39 years, 40-49 years, 50-59 years, and 60+ years. Marital status was dichotomized as married or cohabitating and divorced, separated, divorced, or never married. Due to limited numbers of respondents not identifying as married, respondents were categorized according to whether they were in a relationship akin to marriage or not. Along with marital status, relationship to the head of household was included as a covariate because of its potential influence on whether a person has necessary resources, such as time, to be physically active or whether they may face obstacles such as social obligation. The three categories for this covariate were self, partner/spouse, and other. The highest level of educational attainment was categorized as less than secondary schooling, secondary schooling complete, or at least some college. Employment status was hypothesized to influence both physical activity levels through work-related activity and exercise confidence through the ability to make time for recreational activity. Participants were characterized as either unemployed or employed (casual, part-time, or full-time). Annual income was composed of the sum of four self-reported items: annual household income from employment, from overseas family, from pensions and investments, and from any other sources. The sample was divided into income tertiles (lowest, middle, highest) because meaningful values for established income tiers could not be derived. Height and weight were objectively measured at both the recruitment visit and the laboratory visit, and these values were averaged to calculate BMI (kg/m^2). Social support was measured using the Multidimensional Scale of Perceived Social Support (Zimet et. al., 1988). It is a 12-item questionnaire with responses collected on a Likert scale from 1 (very strongly disagree) to 7 (very strongly agree). For this study, however, a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree) was utilized instead to reduce

the burden of lengthy questionnaires on participants during the laboratory visit. Two examples of statements that convey dimensions of social support are “There is a special person with whom I can share my joys and sorrows” and “I can count on my friends when things go wrong.” Levels of social support were initially categorized as low (mean score $\geq$1 and <2), moderate ($\geq$2 and $\leq$4), and high (>4 and $\leq$5). However, there were few responses of low support (n=3) so the social support variable was dichotomized as low/moderate and high.

Statistical Analysis

The Chi Square statistic was used to test for an association between the categorical predictor variable of exercise confidence and the categorical outcome variable of recreational physical activity. Due to missing values for exercise confidence scores (n=33) and for recreational physical activity (n=4), the sample used to test the association between the primary predictor and outcome variables consisted of 481 observations. This association was further stratified by levels of social support (low/moderate vs. high) to explore potential modification. Although total exercise confidence was the primary predictor, the two sub-scores ‘making time’ and ‘sticking to it’ were also evaluated to evaluate potential mechanisms through which exercise self-efficacy may be related to levels of recreational physical activity.

A secondary objective was to characterize exercise confidence (total, making time, and sticking to it) as well as physical activity (not meeting WHO MET-minutes/week guidelines or not reporting any recreational activity) according to the covariates. The Chi Square statistic was used to test for associations when covariates were categorical and the analysis of variance F-statistic was used for continuous covariates. All statistical analyses will be conducted using SAS

version 9.4 (SAS Institute Inc., NC). All p-values are two sided. P-values less than 0.05 were considered statistically significant.

Results

Sample Characteristics

The analytic sample was comprised of males (44.3%) with an average age of 53.7 years (SD = 10.4) and females (55.7%) with an average of 51.1 years (SD = 9.5). The majority of participants were married or cohabitating (82.1%) while the remainder were divorced, separated, widowed, or never married (17.9%). In terms of position in the household, 44.1% identified as the head, 37.7% identified as the partner/spouse of the head, and 18.2% identified as other. The majority of the sample completed up to secondary schooling (56.5%), while 24.5% had less than secondary schooling and 19.0% completed at least some college. The majority were also unemployed (70.0%), with the remainder reporting casual, part-time or full-time work. Income in Samoan tala (WS$) per year was reported in tertiles. The mean annual income in the lowest tertile was $1,736.46 (SD = 1,297.66), in the middle was $9,795.76 (SD = 3,317.11) and in the highest was $41,829.42 (SD = 51,250.89). The mean BMI was 35.9 kg/m^2 (SD = 7.7), and 7.2% of participants had normal weight (BMI<26), 24.9% had overweight (BMI between 26 and 32), and 68.0% had obesity (BMI>32). The majority reported having low/moderate perceived social support (65.0%) and the remaining had high support (35.1%). Table 1 shows the distribution of sample characteristics by sex.

Exercise Confidence by Covariates

Age, sex, marital status, employment status, and BMI were not significantly associated with total exercise confidence, making time, or sticking to it (Table 2 and Table 3). While relationship to the head of household was not significantly correlated with total exercise confidence or sticking to it, it was correlated with making time ($p=0.030$). More partners/spouses reported low (36.2%) or moderate confidence (36.1%) than high confidence (27.6%). A greater proportion of other members reported high confidence (43.2%) compared to heads of households (33.6%) and partners/spouses (27.6%). Education similarly was only significantly associated with making time ($p=0.021$). Compared to those with less than secondary education, more of those with at least some college reported high confidence in the ability to make time for exercise (24.8% vs. 39.6%). These proportions are 37.2% and 17.7% for low confidence. Annual income was significantly correlated with total exercise confidence ($p<0.001$) and with making time ($p<0.001$). A greater proportion of participants in the highest income tertile expressed high exercise confidence compared to those in the lowest tertile (46.0% vs. 18.5%). Perceived social support was associated with total exercise confidence ($p<0.001$), making time ($p=0.042$), and sticking to it ($p<0.001$). Those with high perceived social support were less likely to report high total exercise confidence compared to those with low/moderate support (20.0% vs. 39.2%).

Physical Activity by Covariates

Physical activity is presented as four different variables. Participants were characterized based on whether or not they met the WHO recommendation for >600 MET-minutes per week, as well as whether or not they reported zero work-related physical activity, zero travel-related

activity or zero recreation-related activity. Table 4 shows the unadjusted associations between covariates and not meeting the MET-minutes per week recommendation. Age, marital status, relationship to the head of household, education, and annual income were not significantly associated with meeting the recommendation. Males were less likely than females to not meet the guidelines (71.6% vs. 87.4%; p<0.001). Those who reported being employed in casual, part-time, or full-time work were less likely than those who were unemployed to not meet guidelines (74.3% vs. 83.3%; p=0.021). Participants with overweight were least likely to have insufficient physical activity (72.8%) compared to those with normal weight (78.8%) and those with obesity (83.7%; p=0.03). Social support was also significantly associated with meeting WHO guidelines (p=0.024). Those with high support were less likely to not meeting guidelines (74.7%) compared to those with low/moderate support (83.3%).

Table 5 show unadjusted associations between sex and work-, travel- and recreation-related physical activity. Females were more likely than males to report no work-related activity (96.2% vs. 91.7%; p=0.031) and more likely to report no travel-related activity (88.8% vs. 73.6%; p=0.031). There was no significant association between recreation-related activity and sex.

Exercise Confidence and Physical Activity

Total exercise confidence (p<0.001), making time (p=0.004), and sticking to it (<0.001) were all associated with recreation-related physical activity (Table 6). Those with high total exercise confidence were least likely to report no recreation-related activity (92.3%) compared to low confidence (99.0%) and moderate confidence (100.0%). Those with high confidence in their ability to make time for exercise were least likely to report no recreation-related activity

(94.2%) compared to low confidence (98.6%) and moderate confidence (98.4%). Those with high confidence in their ability to stick to exercise were least likely to report no recreation-related activity (92.6%) compared to low confidence (99.1%) and moderate confidence (100.0%). As shown in Table 7, all participants reporting high levels of social support also reported zero recreational physical activity.

Table 1. Characteristics of the study population by sex				
		Male ***n*** **= 229**	**Female** ***n*** **= 288**	**Total** ***n*** **= 517**
Characteristic		**N (%)***	**N (%)***	**N (%)***
Age (years)	mean ± SD	53.7 ± 10.4	51.1 ± 9.5	52.3 ± 10.0
	30-39	24 (10.5)	38 (13.2)	62 (12.0)
	40-49	63 (27.5)	100 (34.8)	163 (31.6)
	50-59	73 (31.9)	82 (32.1)	165 (32.0)
	60+	69 (30.1)	57 (19.9)	126 (24.4)
Marital Status	Married or cohabitating	190 (83.0)	233 (81.5)	423 (82.1)
	Divorced, separated, widowed, or never married	39 (17.0)	53 (18.5)	92 (17.9)
Relationship to Head of Household	Self	177 (78.3)	49 (17.1)	226 (44.1)
	Partner/Spouse	0 (0.0)	193 (67.5)	193 (37.7)
	Other	49 (21.7)	44 (15.4)	93 (18.2)
Education	Less than secondary schooling	73 (31.9)	53 (18.5)	126 (24.5)
	Secondary schooling complete	112 (48.9)	179 (62.6)	291 (56.5)
	At least some college	44 (19.2)	54 (18.9)	98 (19.0)
Employment Status	Unemployed	128 (56.1)	232 (81.1)	360 (70.0)
	Casual, part-time or full-time work	100 (43.9)	54 (18.9)	154 (30.0)
Income ($/year)	Lowest tertile (mean: 1,736.46 ± 1,297.66)	74 (32.5)	97 (33.9)	171 (33.3)
	Middle tertile (mean: 9,795.76 ± 3,317.11)	78 (34.2)	94 (32.9)	172 (33.5)
	Highest tertile (mean: 41,829.42 ± 51,250.89)	76 (33.3)	95 (33.2)	171 (33.3)
BMI (kg/m^2)	mean ± SD	33.7 ± 7.1	37.7 ± 7.7	35.9 ± 7.7
	<26	24 (10.5)	13 (4.5)	37 (7.2)
	26 – 32	83 (36.4)	45 (15.7)	128 (24.9)
	>32	121 (53.0)	229 (79.8)	350 (68.0)
Social Support	Low or moderate	136 (61.3)	179 (68.1)	315 (65.0)
	High	86 (38.7)	84 (32.0)	170 (35.1)

[a] Numbers may not sum to 517 due to missing data, and column percentages may not sum to 100% due to rounding.

Table 2. Unadjusted associations between study variables and total exercise confidence				
Characteristic	Low confidence (n = 206)	Moderate confidence (n = 121)	High confidence (n = 157)	p[†]
Age (years), mean ± SD	52.6 ± 10.0	52.2 ± 10.1	51.9 ± 10.0	0.826
Age (years), n (%)				0.991
30-39	23 (39.0)	16 (27.1)	20 (33.9)	
40-49	68 (44.7)	36 (23.7)	48 (31.6)	
50-59	63 (41.2)	40 (33.1)	50 (32.7)	
60+	52 (25.2)	29 (24.0)	38 (24.4)	
Sex, n (%)				0.169
Male	84 (38.0)	61 (27.6)	76 (34.4)	
Female	122 (46.4)	60 (22.8)	81 (51.6)	
Marital Status, n (%)				0.784
Married or cohabitating	166 (42.0)	99 (25.0)	130 (32.9)	
Divorced, separated, widowed, or never married	40 (46.0)	21 (24.1)	26 (29.9)	
Relationship to Head of Household, n (%)				0.442
Self	86 (39.6)	55 (25.4)	76 (35.0)	
Partner/Spouse	83 (47.7)	41 (23.6)	50 (28.7)	
Other	33 (37.5)	24 (27.3)	31 (35.2)	
Education, n (%)				0.139
Less than secondary schooling	63 (52.1)	29 (24.0)	29 (24.0)	
Secondary schooling complete	106 (40.0)	66 (24.9)	93 (35.1)	
At least some college	37 (38.5)	25 (26.0)	34 (35.4)	
Employment Status, n (%)				0.526
Unemployed	136 (40.7)	86 (25.8)	112 (33.5)	
Casual, part-time or full-time work	68 (46.3)	34 (23.1)	45 (30.6)	
Income ($/year), n (%)				<0.001
Lowest tertile	80 (49.4)	52 (32.1)	30 (18.5)	
Middle tertile	62 (39.7)	42 (26.9)	52 (33.3)	
Highest tertile	61 (37.4)	27 (16.6)	75 (46.0)	
BMI (kg/m^2), mean ± SD	36.2 ± 8.3	36.0 ± 7.8	35.8 ± 7.3	0.932

BMI (kg/m^2), n (%)				0.598
<26	19 (52.8)	7 (19.4)	10 (27.8)	
26 – 32	45 (37.8)	33 (27.7)	41 (34.5)	
>32	142 (43.3)	81 (24.7)	105 (32.0)	
Social Support, n (%)				<0.001
Low to Moderate	122 (38.9)	69 (22.0)	123 (39.2)	
High	84 (49.4)	52 (30.6)	34 (20.0)	

[a] Numbers may not sum to totals due to missing data, and row percentages may not sum to 100% due to rounding.
[†] P-value for analysis of variance F-test (continuous variable) or χ^2 test (categorical variable).

Table 3. Unadjusted associations between study variables and exercise confidence subscales for making time and for sticking to it								
	Making Time				Sticking to it			
Characteristic	Low confidence (n = 140)	Moderate confidence (n = 185)	High confidence (n = 159)	p†	Low confidence (n = 223)	Moderate confidence (n = 98)	High confidence (n = 163)	p†
Age (years), mean ± SD	52.8 ± 9.5	52.2 ± 10.3	51.8 ± 10.1	0.676	52.6 ± 9.9	52.0 ± 10.1	52.0 ± 10.1	0.799
Age (years), n (%)				0.631				0.984
30-39	11 (18.6)	27 (45.8)	21 (35.6)		24 (40.7)	14 (23.7)	21 (35.6)	
40-49	48 (31.6)	58 (38.2)	46 (30.3)		72 (47.4)	31 (20.4)	49 (32.2)	
50-59	44 (28.8)	58 (37.9)	51 (33.3)		71 (46.4)	30 (19.6)	52 (34.0)	
60+	37 (31.1)	42 (35.3)	40 (33.6)		56 (47.1)	23 (19.3)	40 (33.6)	
Sex, n (%)				0.192				0.240
Male	55 (24.9)	88 (39.8)	78 (35.3)		93 (42.1)	50 (22.6)	78 (35.3)	
Female	85 (32.3)	97 (36.9)	81 (30.8)		130 (49.4)	48 (18.3)	85 (32.3)	
Marital Status, n (%)				0.794				0.527
Married or cohabitating	116 (29.3)	148 (37.5)	131 (33.2)		178 (45.1)	81 (20.5)	136 (34.4)	
Divorced, separated, widowed, or never married	24 (27.6)	36 (41.4)	27 (31.0)		45 (51.7)	16 (18.4)	26 (29.9)	
Relationship to Head of Household, n (%)				0.030				0.484
Self	59 (27.2)	85 (39.2)	73 (33.6)		92 (42.4)	46 (21.2)	79 (36.4)	
Partner/Spouse	63 (36.2)	63 (36.1)	48 (27.6)		89 (51.2)	31 (17.8)	54 (31.0)	
Other	17 (19.3)	33 (37.5)	38 (43.2)		38 (43.2)	20 (22.7)	30 (34.1)	
Education, n (%)				0.021				0.082
Less than secondary schooling	45 (37.2)	46 (38.0)	30 (24.8)		68 (56.2)	23 (19.0)	30 (24.8)	

Secondary schooling complete	78 (29.4)	97 (36.6)	90 (34.0)		115 (43.4)	51 (19.3)	99 (37.4)	
At least some college	17 (17.7)	41 (42.7)	38 (39.6)		40 (41.7)	23 (24.0)	33 (34.4)	
Employment Status, n (%)				0.078				0.503
Unemployed	102 (30.5)	116 (34.7)	116 (34.7)		148 (44.3)	71 (21.3)	115 (34.4)	
Casual, part-time or full-time work	37 (25.2)	67 (45.6)	43 (29.3)		73 (49.7)	26 (17.7)	48 (32.7)	
Income ($/year), n (%)				<0.001				<0.001
Lowest tertile	63 (38.9)	62 (38.3)	37 (22.8)		85 (52.5)	43 (26.5)	34 (21.0)	
Middle tertile	40 (25.6)	66 (42.3)	50 (32.1)		72 (46.2)	34 (21.8)	50 (32.1)	
Highest tertile	36 (22.1)	55 (33.7)	72 (44.2)		63 (38.7)	21 (12.9)	79 (48.5)	
BMI (kg/m^2), mean ± SD	36.1 ± 8.2	36.2 ± 7.9	35.7 ± 7.5	0.807	36.2 ± 8.2	36.0 ± 7.8	35.8 ± 7.3	0.902
BMI (kg/m^2), n (%)				0.820				0.657
<26	11 (30.6)	14 (38.9)	11 (30.6)		20 (55.6)	5 (13.9)	11 (30.6)	
26 – 32	34 (28.6)	41 (34.5)	44 (37.0)		50 (42.0)	27 (22.7)	42 (35.3)	
>32	95 (29.0)	130 (39.6)	103 (31.4)		153 (46.7)	66 (20.1)	109 (33.2)	
Social Support, n (%)				0.042				<0.001
Low to Moderate	89 (28.3)	110 (35.0)	115 (36.6)		129 (41.1)	55 (17.5)	130 (41.4)	
High	51 (30.0)	75 (44.1)	44 (25.9)		94 (55.3)	43 (25.3)	33 (19.4)	

[a] Numbers may not sum to totals due to missing data, and row percentages may not sum to 100% due to rounding.
[†] P-value for analysis of variance F-test (continuous variable) or χ^2 test (categorical variable).

Table 4. Unadjusted associations between study variables and not meeting WHO METs/week recommendation for physical activity		
Characteristic	Not meeting WHO recommendation (n = 405)	p[†]
Age (years), mean ± SD	52.7 ± 9.9 (50.3 ± 9.7 meeting rec)	0.031
Age (years), n (%)		0.278
30-39	45 (75.0)	
40-49	123 (77.4)	
50-59	132 (82.5)	
60+	104 (84.6)	
Sex, n (%)		<0.001
Male	156 (71.6)	
Female	249 (87.4)	
Marital Status, n (%)		0.638
Married or cohabitating	329 (80.1)	
Divorced, separated, widowed, or never married	74 (82.2)	
Relationship to Head of Household, n (%)		0.052
Self	170 (77.6)	
Partner/Spouse	163 (85.8)	
Other	68 (75.6)	
Education, n (%)		0.432
Less than secondary schooling	103 (84.4)	
Secondary schooling complete	224 (78.9)	
At least some college	76 (80.0)	
Employment Status, n (%)		0.021
Unemployed	294 (83.3)	
Casual, part-time or full-time work	110 (74.3)	
Income ($/year), n (%)		0.203
Lowest tertile	126 (75.9)	
Middle tertile	137 (82.5)	
Highest tertile	139 (82.7)	
BMI (kg/m^2), mean ± SD	36.5 ± 7.8 (34.0 ± 6.9 meeting rec)	0.004
BMI (kg/m^2), n (%)		0.030

<26	26 (78.8)	
26 – 32	91 (72.8)	
>32	287 (83.7)	
Social Support, n (%)		0.024
Low to Moderate	255 (83.3)	
High	124 (74.7)	

[a] Numbers may not sum to totals due to missing data, and column percentages may not sum to 100% due to rounding.
[†] P-value for analysis of variance F-test (continuous variable) or χ^2 test (categorical variable).

Table 5. Unadjusted associations between sex and work-, travel-, and recreation-related physical activity

Characteristic	Males	Females	p[†]
No work-related physical activity, n (%)	210 (91.7)	277 (96.2)	0.031
No travel-related physical activity, n (%)	162 (73.6)	254 (88.8)	<0.001
No recreation-related physical activity, n (%)	216 (95.6)	282 (98.3)	0.073

[a] Numbers may not sum to totals due to missing data, and column percentages may not sum to 100% due to rounding.
[†] P-value for χ^2 test

Table 6. Unadjusted associations between exercise confidence and recreation-related physical activity

Exercise Confidence	No recreation-related physical activity (n = 498)	p[†]
Total		<0.001
Low	204 (99.0)	
Moderate	120 (100.0)	
High	143 (92.3)	
Making Time		0.004
Low	138 (98.6)	
Moderate	182 (98.4)	
High	147 (94.2)	
Sticking to it		<0.001
Low	221 (99.1)	
Moderate	97 (100.0)	
High	149 (92.6)	

[a] Numbers may not sum to totals due to missing data, and row percentages may not sum to 100% due to rounding.
[†] P-value for Fisher's exact test.

Table 7. Associations between exercise confidence and recreation-related physical activity controlling for social support				
	Low or moderate social support		High social support	
Exercise Confidence	No recreation-related physical activity (n = 297)	p[†]	No recreation-related physical activity (n = 170)	p[†]
Total		0.001		^
Low	120 (98.4)		84 (100.0)	
Moderate	68 (100.0)		52 (100.0)	
High	109 (90.1)		34 (100.0)	
Making Time		0.078		^
Low	87 (97.8)		51 (100.0)	
Moderate	107 (97.3)		75 (100.0)	
High	103 (92.0)		44 (100.0)	
Sticking to it		0.002		^
Low	127 (98.5)		94 (100.0)	
Moderate	54 (100.0)		43 (100.0)	
High	116 (90.6)		33 (100.0)	

[a] Numbers may not sum to totals due to missing data, and row percentages may not sum to 100% due to rounding.
[†] P-value for Fisher's exact test.
^P-value cannot be calculated because a row or column sum is zero.

Discussion

The sample in this study is characterized by low levels of physical activity. To our knowledge, data on the amount and types of physical activity in a diverse sample of Samoan adults have not previously been published. A little over three-fourths of participants reported engaging in zero minutes of any form of moderate or vigorous physical activity on any given day. Only one in five adults are meeting WHO guidelines of sufficient physical activity of 600 MET-minutes per week. The little physical activity that is taking place falls predominantly under work- or travel-related domains, and males are more likely than females to engage in both of these. As expected, those who are employed are more likely to take part in work-related physical activity and therefore more likely to meet the WHO guidelines for physical activity. Recreation represents the domain in which the least number of moderate- or vigorous-intensity activity minutes were reported. In fact, 97% of participants had zero daily minutes of recreation-related physical activity. Given that this population is largely sedentary and that the fewest number of people engage in recreational exercise, there is opportunity for increasing levels of physical activity by increasing recreation-related activity.

One potential avenue through which recreational physical activity is influenced is exercise self-efficacy, or exercise confidence. In the literature that largely exists in industrialized, high-income countries, exercise self-efficacy has been found to be a predictor, if not determinant, of exercise behaviors (Bauman et. al., 2012). Social cognitive theory is commonly applied to physical activity interventions, and self-efficacy is a central tenet of motivation in this theoretical framework (Bandura, 1997). Since self-efficacy is situation-dependent, exercise confidence must be evaluated in reference to particular barriers that may

exist to the adoption and maintenance of exercise (McAuley & Blissmer, 2000). Considering the challenging nature of tasks related to exercise, self-efficacy serves as a primary contributor to motivation for initiating exercise and likely serves as a mediator for the relationship between social support and maintenance of exercise (McAuley et. al., 2003).

Due to the limited variation in levels of recreation-related physical activity, a model for the relationship between exercise confidence and exercise levels adjusted for confounders could not be tested. However, a Chi Square test of the association between these variables confirmed the relationship seen in the literature. Those with higher exercise confidence were more likely to engage in at least some amount of recreational exercise compared to those with low exercise confidence. Still, there was a gap between the number of participants identifying as having high exercise confidence, both in the making time domain and the sticking to it domain, and the number of participants reporting participation in leisure time exercise. In fact, the distribution in scores for total exercise confidence had greater variation than did the distribution for minutes of recreational activity per week. Of 484 participants who had valid exercise confidence scores, 206 were characterized as having low confidence, 121 as moderate confidence, and 157 as high confidence. Yet, only 15 participants reported any recreation-related physical activity at all. This gap represents a potential avenue for intervention. For those who report low levels of exercise confidence, programs that promote greater self-efficacy may serve to increase engagement in recreational physical activity. However, for those who report high levels of confidence that are not paralleled by high levels of physical activity, other barriers to exercise may be more salient in this setting.

Qualitative studies have indicated that several cultural and physical barriers may be at play in the Samoan context. Structural barriers come in the form of a lack of infrastructure for engaging in recreational physical activity and issues of safety. More specifically, the dearth of sidewalks and footpaths and the presence of dangerous dogs are reported as environmental elements that hinder activities like walking and jogging (Tuagalu, 2011; Heard, Auvaa & Conway, 2017). Additionally, physical discomfort from exercise and related social norms are key barriers (Tuagalu, 2011). In the current sample, those who had overweight were more likely to meet WHO guidelines for MET-minutes per week, followed by those who had normal weight, with those who had obesity least likely to engage in physical activity. Norms around body weight, therefore, may also be a driver of exercise behaviors (Hardin et. al., 2018). Those with normal weight may not see a reason for engaging in exercise, while those with overweight may feel physical and social discomfort in physical activity.

Social obligations in the form of family and church commitments have also been suggested as competing with physical activity (Tuagalu, 2011; Hardin, 2014). The approach in the current analysis to assessing the role of social obligations in potential pathways between exercise confidence and exercise levels was through perceived social support. Higher levels of social support may be reflections of higher levels of social obligations and involvement in communities in the Samoan context. In the framework of traditional Samoan kinship structures, reciprocity is central to familial and social networks (Thornton et. al., 2010). Established conventions for this reciprocal nature of relationships that offer both cultural and financial capital are meant to maintain social structures (Stewart-Withers & O'Brian, 2006). Higher perceived social support, therefore, likely also means higher levels of social obligation due to

these communal relationships. The de-prioritization of individual health in the interest of familial and social obligations that promote perceived social well-being has been recorded in Samoan society (Hawley & McGarvey, 2015). This characterization of social life in Samoa help to explain the relationships between social support, exercise confidence, and recreational physical activity in the current study. Participants with high perceived social support were less likely to report high exercise confidence than those with low/moderate support. Those with high social support also likely have more social obligations and may not be able to commit to carving out time and resources to engaging in recreational exercise, which promotes personal health. As shown in this study and in previous research, higher levels of exercise confidence predict higher levels of exercise behavior. Accordingly, adults with high social support in the Samoan context reporting lower levels of exercise confidence would be expected to have mirroring low levels of recreation-related physical activity. This hypothesis was confirmed by the data in this study. Of those reporting high social support, all reported zero minutes of exercise. Still, not all participants who had high social support and zero recreational physical activity reported low exercise confidence. This indicates the need to address other barriers apart from low self-efficacy in increasing exercise participation.

The primary limitation of this study is that the physical activity data are collected by self-report. A systematic review of comparisons of direct and self-reported measures of physical activity concluded that the correlation between these two forms of assessment varied depending on the tools used and that the correlations were generally low-to-moderate (Prince et. al., 2008). Accelerometer data were available for this study sample; however, this method of direct assessment of physical activity was not appropriate for the objective of this study

because accelerometer data are unable to distinguish between physical activity through work, travel or leisure. Since exercise self-efficacy is directly related to recreation-related physical activity in particular, the self-reported measures needed to be utilized. Another limitation is that the exercise confidence scale was developed in a U.S.-based setting and some of the items may not have been relevant or applicable to the study population. For example, the item asking whether participants feel confident that they could read or study less to stick to an exercise routine is likely not applicable to the sample of Samoan adults. However, the remaining 11 items do address more generally relevant concepts such as familial obligations and making time for exercise. In the future, an exercise confidence survey that is particular to the barriers to exercise in Samoa may be developed.

The current study highlights the significant gap between levels of exercise confidence and levels of exercise in a sample of Samoan adults. The 3% of participants who report any recreation-related physical activity at all are more likely to have higher exercise confidence than those with no reported exercise. Still, not all who report high confidence actually exercise. Moreover, the spread of exercise confidence scores indicates that both those with low exercise confidence and those with high exercise confidence can receive interventions that increase their levels of physical activity. If self-efficacy is not hindering the confident individuals, then efforts to reduce other structural, environmental and social barriers may allow these individuals to actually engage in leisure time physical activity. Conversely, those with low exercise confidence may benefit from interventions that promote comfort with exercise and help navigate potential motivational barriers. Future studies should implement and evaluate such interventions.

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Appendix A – Physical Activity Questionnaire

Participant ID:_____ 1

Tulaga tau fa'amalositino
Physical Activity

Mafaufau i au galuega masani i le vaiaso, e tali mai ai fesili nei mo le 12 masina ua tea.
We will ask you about your physical activity at work and in your free time because these important factors influence how well you feel and some of the health measurements we take.

1. O fea o e faigaluega ai nei? _____
   Where do you work now?
2. O le a lau matagaluega? _____
   What is your job title?
   2.a. Pe faigaluega tumau pe leai?
   Is this work full time or part time?
   - ☐ E le faigaluega (0) *Unemployed*
   - ☐ Galuega togi aso (1) *Casual work*
   - ☐ Galuega faavaitaimi (2) *Part time*
   - ☐ Galuega tumau (3) *Full time*
3. E tele ina e nofo pe ete tu e te le gaioi, pe a e galue i lau galuega? (i.e. laitiiti ifo ma le 10 minute e savali ai mo se taimi)
   Does your work involve mostly sitting or standing, with walking for no more than 10 mins at a time?
   ☐ Leai (0) *No* ☐ Ioe (1) *Yes* → **Alu i le fesili 6 - *Go to Q6***
4. E aofia i lau galuega masani le faatinoina o galuega mamafa e pei o le siisii mea mamafa, eliina o lua po o galuega fau fale? (i.e. Galuega e faatinoina i le 10 minute pe sili atu)
   Does your work involve vigorous activities like heavy lifting, digging or construction for at least 10 mins at a time?
   ☐ Leai (0) *No* → **Alu i le fesili 5 - *Go to Q5*** ☐ Ioe (1) *Yes*
   4. a. E fia ni aso o le vaiaso e masani ona e galue ai faapea?
   In a typical week on how many days do you do vigorous activities as part of your work?
   _____ Aso i le vaiaso - *Days per week*
   4. b. O le a se umi o le taimi e masani ona e galue ai faapea i le aso?
   On a typical day when you do vigorous activities how much time do you spend doing such work?
   ____ Itula - *Hours* ____ Min
5. E iai ni vaega o lau galuega e manaomia ai le faanatinati o lau savali po o le siisii foi o ni mea e le mamafa tele i se 10 minute pe sili atu foi?
   Does your work involve moderately intense activities like brisk walking or carrying light loads for at least 10 mins at a time?
   ☐ Leai (0) *No* → **Alu i le fesili 6 - *Go to Q6*** ☐ Ioe (1) *Yes*
   5. a. E fia ni aso o le vaiaso e te faatinoina ai lea galuega?

In a typical week on how many days do you do moderate activities as part of your work

_____ Aso i le vaiaso - *Days per week*

5. b. O le a se umi o le taimi e masani ona e galue ai faapea i le aso?
On a typical day when you do moderate activities how much time do you spend doing such work?
____ Itula - *Hours* ____ Min

6. O le a le umi e masani ona e faigaluega ai i aso taitasi?
How long is your typical work day?
____ Itula - *Hours*

7. E te savali pe ete alu i se uila vili vae ma e toe foi mai i se taimi e sili atu i le 10 minute? (i.e. I le galuega, maketi, lotu etc.)
Do you walk or use a bicycle (pedal cycle) for at least 10 mins continuously to get to places?

☐ Leai (0) *No* → **Alu i le fesili 8 - *Go to Q8*** ☐Ioe (1) *Yes*

7. a. E fia ni aso o le vaiaso e masani ona e malaga ai faapea?
In a typical week, on how many days to you walk or bicycle for at least 10 mins to get to places?
_____ Aso i le vaiaso - *Days per week*

7. b. O le a se umi o le taimi e masani ona e malaga ai faapea i le aso?
How much time would you spend walking or bicycling for travel on a typical day?
____ Itula - *Hours* ____ Min

8. I lou taimi paganoa/tafao/taalo etc.,e tele ina e saofai, taotooto faalagolago, tu ma savali foi mo se umi e i lalo ifo o le 10 minute?
Does your leisure time involve mostly sitting, reclining or standing with no physical activity lasting more than 10 minutes at a time?

☐ Leai (0) *No* ☐Ioe (1) *Yes* → **Alu i le fesili 11 - *Go to Q11***

9. I ou taimi paganoa, e te faatinoina ni galuega mamafa e pei o le siisii mea mamafa, tamo'e pe ete taalo malosi foi i ni taaloga i le 10 minute pe sili atu?
In your leisure time do you do any vigorous activities like running or strenuous sports for at least 10 mins at a time?

☐ Leai (0) *No* → **Alu i le fesili 10 - *Go to Q10*** ☐Ioe (1) *Yes*

9. a. E fia ni aso o le vaiaso ete faatinoina ai lea galuega?
In a typical week how many days do you do vigorous activity as part of your leisure time?
_____ Aso i le vaiaso - *Days per week*

9. b. O le a le umi o le taimi e te faia ai ia galuega i se aso se tasi o le vaiaso?
How much time do you spend doing vigorous leisure activity on a typical day?
____ Itula - *Hours* ____ Min

10. I ou taimi paganoa e te faatinoina ni gaioiga e le mamafa tele e pei o le taalo, vili se uila poo le aau, i le 10 minute pe sili atu?
In your leisure time do you do any moderate-intensity activities like brisk walking, cycling or swimming for at least ten minutes at a time?

☐ Leai (0) *No* → **Alu i le fesili 11 - *Go to Q11*** ☐Ioe (1) *Yes*

10. a. E fia ni aso e te faatinoina ai ia galuega?
In a typical week, on how many days do you do moderate activities as part of your leisure time?
_____ Aso i le vaiaso - *Days per week*

10. b. O le a le umi o le taimi e te faatinoina ai ia galuega i le aso?
How much time do you spend doing moderate leisure activity on a typical day?
____ Itula - *Hours* ____ Min

O le fesili lenei e faasino i au galuega e fai pe a e nofonofo pe ete taotooto i taimi e te ala ai. Mafaufau i le 7 aso ua tuanai atu i le taimi lea o lo o e faigaluega i lou fale faigaluega po o lou lava fale, pe o le taimi o lo o e tafao pe nofonofo ai ma taimi e te alu ai e vaai au uo pe matamata TV. Ae le o taimi e te tofa ai.
The following question is about sitting or reclining. Think back over the last 7 days to time spent at work, at home, in leisure; including time sitting at a desk, visiting friends, reading or watching television, but DO NOT include time sleeping.

11. I le 7 aso talu ai, o le a le umi o se taimi e masani ona e nofonofo pe ete taotooto ai, I se aso e tasi?
Over the past 7 days, how much time did you spend sitting or reclining in a typical day?
____ Itula - *Hours* ____ Min

MAE'A LE FAATALATALANOAGA. Siaki po ua mae'a ☐
END OF SURVEY. Check if complete.

Appendix B – Exercise Confidence Survey

Participant ID:_____ 4

O le pepa fesili o le mautinoa i le fa'amalosi tino
Exercise Confidence Survey

O i lalo ifo o mea e mafai e tagata ona fai pe a o lo'o taumafai e fa'ateleina pe fa'auaua le fa'amalosi tino. O lo'o fia iloa e matou ia fa'amalosi tino e pei o le savali vave, o le auau, o le tietie uila ma vasega o le fa'amalosi tino. Pe e te le fiafia i le fa'amalosi tino pe leai, fa'amolemole fa'avasega mai lou mautinoa i lou mafai ona fa'amalosi i nei mea mo ni masina e ono.

Below is a list of things people might do while trying to increase or continue regular exercise. We are interested in exercises like brisk walking, swimming, bicycle riding or aerobics classes. Whether you exercise or not, please rate how confident you are that you could really motivate yourself to do things like these consistently, for at least six months:

	Ou te iloa ou te le mafaia *I know I cannot*	---------->			Ou te iloa ou te mafaia *I know I can*	Ou te le iloa (77) *Does not apply*
1. O le usu po i le taeao, e aofia ai fa'aiuga o le vaiaso e fa'amalosi tino. *Get up early, even on weekends, to exercise.*	1	2	3	4	5	☐
2. Tumau pea i faamalositino tusa lava pe e te le lāvā mai le galuega. *Stick to your exercise program after a long, tiring day at work.*	1	2	3	4	5	☐
3. Ia fai pea le fa'amalosi tino e ui ina maua oe i le loto mafatia. *Exercise even though you are feeling depressed.*	1	2	3	4	5	☐
4. Ia tu'u ese se taimi mo le fa'amalosi tino e aofia ai le savali, tamo'e, auau, ma nisi fa'amalosi tino e fai i	1	2	3	4	5	☐

	le 30 minute, fa'atolu i le vaiaso. *Set aside time for a physical activity program; that is walking, jogging, swimming, or other continuous activities for at least 30 minutes, 3 times per week.*					
5.	Faa'auau pea au faamalositino tusa lava pe o loo tele vave pe telegese ia te oe. *Continue to exercise with others even though they seem too fast or too slow for you.*	1	2	3	4	5 ☐
6.	Tumau pea i la'u polokalame o le fa'amalosi tino pe afai o lo'o e fetai a'i ma se suiga faigata o lou olaga (e pei o le tete'a, o le maliu o le aiga ma nisi fa'afitauli) *Stick to your exercise program when undergoing a stressful life change (e.g. divorce, death in the family, moving).*	1	2	3	4	5 ☐
7.	Auai se pati pe a ma'ea le fa'amalosi tino. *Attend a party only after exercising.*	1	2	3	4	5 ☐
8.	Tumau i polokalame o le fa'amalosi tino e ui ina mana'omia e lou aiga se taimi tele mai ia oe. *Stick to your exercise program when your family is demanding more time from you.*	1	2	3	4	5 ☐

Participant ID:_____ 6

9. Tumau i polokalame o le fa'amalosi tino pe afai e i ai ni ou feau o le fale o lo'o fia fai. *Stick to your exercise program when you have household chores to attend to.*	1	2	3	4	5	☐
10. Tumau i polokalame o le fa'amalosi tino e ui ina tele ou galuega e tatau ona fai. *Stick to your exercise program even when you have excessive demands at work.*	1	2	3	4	5	☐
11. Tumau i polokalame o le fa'amalosi tino e ui ina tele ou mea e fai. *Stick to your exercise program when social obligations are very time consuming.*	1	2	3	4	5	☐
12. Ia ititi lou taimi faitau ma le a'oa'oga ina ia mafai ona tele lou fa'amalosi tino. *Read or study less in order to exercise more.*	1	2	3	4	5	☐

MAE'A LE FAATALATALANOAGA. Siaki po ua mae'a ☐
END OF SURVEY. Check if complete.

Appendix C – Multidimensional Scale of Perceived Social Support

Participant ID:_____ 1

Fesoasoani Lautele ma ona faāfitāuli

Social Support & Conflict

O le Fua mo le lagolago o oe e le lautele

MSPSS: Multidimensional Scale of Percieved Social Support

	Matua'i Fevaevaea'i *Strongly disagree*	Fevaevaea'i *Disagree*	Le Lotomalie toe le fevaevaea'i *Neither agree nor*	Lotomalie *Agree*	Matua'l Lotomalie *Strongly agree*	Te'ena e tali (99) *Refuse to answer*
1. E i ai le tagata fa'apitoa o lo'o i ai pe a ou mana'omia se fesoasoani. *There is a special person who is around when I am in need.*	1	2	3	4	5	☐
2. E i ai le tagata fa'apitoa e mafai ona ou fa'asoa ai o'u fiafiaga ma fa'anoanoaga. *There is a special person with whom I can share my joys and sorrows*	1	2	3	4	5	☐
3. E fia fesoasoani tele lo'u aiga ia te a'u. *My family really tries to help me.*	1	2	3	4	5	☐
4. Ou te maua se fesoasoani mo o'u lagona mai lo'u aiga pe a ou mana'omia. *I get the emotional help and support I need from my family.*	1	2	3	4	5	☐
5. E i ai se tagata fa'apitoa mo a'u e mafai ona ia fa'amafanafana ia te a'u. *I have a special person who is a real source of comfort to me.*	1	2	3	4	5	☐
6. E taumafai o'u uo e fesoasoani ia te a'u. *My friends really try to help me.*	1	2	3	4	5	☐
7. E mafai ona ou fa'amoemoe i o'u uo pe a afai e i ai ni mea sese. *I can count on my friends when things go wrong.*	1	2	3	4	5	☐
8. E mafai ona ou talanoa i lo'u aiga i o'u fa'afitauli.	1	2	3	4	5	☐

Participant ID:_____ 2

I can talk about my problems with my family.						
9. E i ai o'u uo e mafai ona ou fa'asoa ai o'u fiafiaga ma fa'anoanoaga. *I have friends with whom I can share my joys and sorrows.*	1	2	3	4	5	☐
10. I lo'u olaga, e i ai se tagata fa'apitoa e tausia o'u lagona. *In my life, there is a special person who cares about my feelings.*	1	2	3	4	5	☐
11. E fia fesoasoani lo'u aiga e fai o'u filifiliga. *My family is willing to help me make decisions.*	1	2	3	4	5	☐
12. E mafai ona ou talanoa io'u uo i o'u fa'afitauli. *I can talk about my problems with my friends.*	1	2	3	4	5	☐