

# **I Love My Sun:** ***An Educational Space Weather Outreach Tool for Children and Senior People***

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# *Abstract*

In the present day society, there is a vital need for setting up education and outreach activities in the Space Weather field for creating a healthy environment for the proper development of Space Weather markets along with the fundamental and applied research activities.

It is important to educate children about the important role that the Sun has in their lives. This presentation gives an educational outreach tool entitled “I Love My Sun” that has been developed for school children in the approximate age group 7 through 11 years. Its main objective is to make children aware of space weather, the Sun, Sun-Earth relations and how they, the children, are part of this global picture. Children are given a lecture about the Sun; this is preceded and followed by the children drawing a picture of the Sun.

The activity was initiated by Y. Tulunay in Ankara, Turkey as national project in the context of the 50<sup>th</sup> anniversary of Space Age and IHY activities. Since then it has been extended into a spatial (Europe) and temporal dimensions. A metric has been developed to facilitate an objective evaluation of the outcomes of the Events.

In this presentation, the background behind the “I Love My Sun” initiative is given and it is described how to perform an “I Love My Sun” event. Impressions and main results from the case studies are given.

As a new extension, preliminary examples are also given concerning senior people.

## Main objective of I Love My Sun initiatives:

- (i) to make children of **7-11 yr** age group
- (ii) to make senior people above 70 yr old  
**aware of**
  - **space weather, Sun, Sun-Earth relations**
  - **how children become part of this global picture.**

There are **three** main **parts** to an  
I Love My Sun Event

## *Part 1: Prior to School Visit*

- **Choose** school.
- Contact school. Decide on **date** for the scheduling of your national **EVENT**
- Inf. on school: **public/private**; location of school (**city/rural**); does the school **specialise in any specific topics (autism ; music; science; etc.)**.

## *Part 2: School Visit*

At beginning of each school visit  
following information should be  
gathered for each student:  
**name, age, gender (F/M),**  
**has the student already been given a**  
**lecture / seen a movie / read a book**  
**about the Sun**

*I Love My Sun event is divided into three sub-parts:*

- (i) Children are asked to draw the Sun as they perceive it.**

*Identify on the drawing the full name of the student and write “before lecture”.*

*I Love My Sun event is divided into three sub-parts:*

(ii-1) Basic set of **lectures** on the Sun – Earth relation and space weather are given to the children.

*This may be followed by a brain storming session during which the students might be interactive and ask questions if they have any.*



*I Love My Sun event is divided into three sub-parts:*

(ii-2) Children **asked**  
**to draw the Sun again.**

*Identify on the drawing the full name of the student and write “after lecture”.*

## *Part 3: After School Visit*

- Following a school visit **each drawing should be scanned and made into an electronic version.**









# *Case Studies*

## **The IHY Event in Ankara, 2007**

***ODTÜ Koleji***

**FP6 SWEETS / IHY /  
COST 724  
“I LOVE MY SUN” (An  
outreach Activity in  
Turkey:  
Space Weather and Sun  
as conceived by School  
Children of age 7-11)**

**Altogether, there were  
51 students involved in  
the exercise. There  
were 9 shortlist  
children paintings of  
Sun and Sun – Earth  
relation.**

Name of the Child	Before Training	After Training
Aybike İpekçi		
Eylül Yeşilyurt		
Denizhan Akpınar		
İdil Gülen		

## *Case Studies*

### **1 - I Love My Sun 2 Event: “Kütükçü Alibey Primary School”, Ankara**

**School hosts some children with Autism Spectrum Disorder (W ASD) as part of their training programs of the MEB in Ankara**

Children **W ASD** in this school spend:

**2 h/day individual training**

**2 h/day group therapy**

**2 h/day training together with  
children without ASD**

**I Love My Sun Activity** was  
performed with **both categories** of  
students together at the  
**same art class on the same class hour**

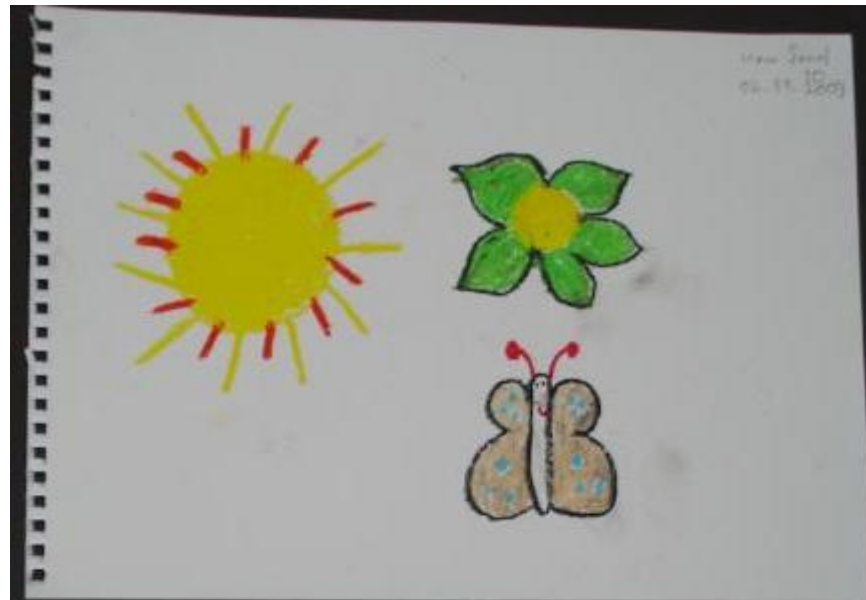
## *Figure 1.1*

- Figure 1.1 illustrate some typical results of the children **without ASD.**



ŞENOL, İrem (7-11 yr), F

w out



Before



After

GÜNDÜZ, Muratcan (7-11 yr), M

without



Before



After

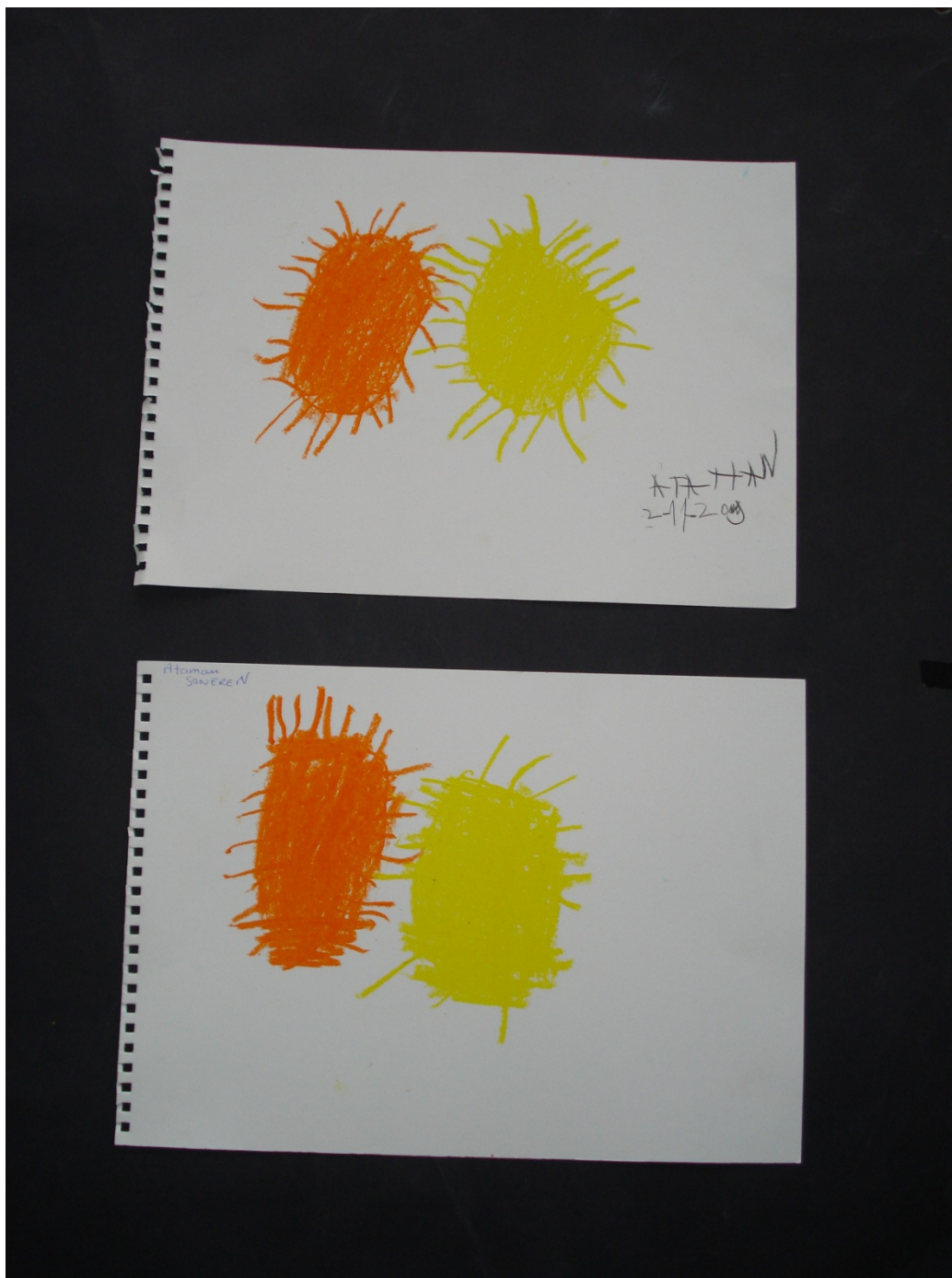
## *Figure 1.2*

Figure 1.2 illustrate some typical results of the children W ASD



Before

After



Before

After

## Children **W** **ASD** drawings

- **paid attention to the details rather than global processing, local processing;**
- displayed an **unusual creativeness** that nobody could think of
- exhibited **perseveration** (sameness- to stuck, persist on the same issue, thought)

## ***2. I Love My Sun 3 and I Love My Sun 4 Events***

**SPATIAL** parameter:

*initiative has gone **European***

cont.

**I LOVE MY SUN Action:**  
*has been conducted in*

***Brussels, Belgium***

***Kiev, Ukraine***

***Belgrade, Serbia***

***Ankara, Turkey***

[<http://www.ilovemysun.org/>]



## *2.1 BÜ Özel Ayşeabla Schools: 1st visit*

- Three classes
- 66 children
- (age group 8-10 years)

# *Figure 2.1*

Figure 2-1

[ <http://sidc.oma.be/esww7/> ]

[ <http://www.llovemysun.org/> ]

ŞİMŞEK, Nilsu (8 yr), F



Before



After

ATALAY, Yiğit Halit,(8 yr), M



Before



After

cont.

- children **absorbed** the **information conveyed** to them concerning the Sun (e.g. sunspots, flares, Sun-Earth relations)
- They expressed **Sun** in their paintings as a **picture story**

cont.

- **Most** of the children put the **quarter of the Sun** at one top corner of their **before** drawing
- **After** training **Sun** became the **dominant motif**  
children **perceive** the **Sun** as an **independent object/identity**

## 2.2 BÜ Özel Ayşeabla Schools: 2nd visit

**TEMPORAL** parameter:

*“I Love My Sun” event is to be performed in the **same class** for consecutive years.*



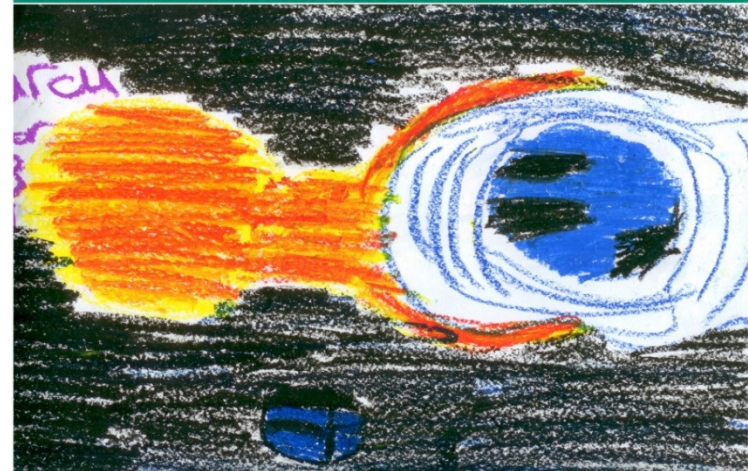
Before



ACAR, Elif Burcu (F)



After





**Table 1a** Metrics for the evaluation of the results **BEFORE(B)** the tutorial

Bi	Human characters are used as solar features.	YES	NO
Bii	Sun-Earth connections are in the form of daily life experiences (e.g. Flowers, grass, happy children, etc.)	YES	NO
Biii	Is the Sun a major character in the drawings (e.g. does the Sun occupy a major part or is it placed in one of the corners of the drawing?)	YES	NO
Biv	The difference between age 8 and age 11 in quality of perception, enhancement of knowledge and expression	0 (No Diff.)	+ (Increased) - (Decreased)

**Table 1b** Metrics for the evaluation of the results **AFTER(A)** the tutorial

Ai	Human characters are replaced by:	SPACE WEATHER (Sun Spots; Solar Wind; Aurora; ...)		
Aii	Sun-Earth relations are expressed in terms of	SPACE WEATHER (Sun Spots; Solar Wind; Aurora; ...)		
Aiii	Has the Sun become a major character?	YES	NO	
Aiv	Does the child use brighter/richer colors in this phase of the event?	YES	NO	SAME
Av	Does the child draws a similar one to that of pre tutorial	YES	NO	
Avi	The difference between age 8 and age 11 in quality of perception, enhancement of knowledge and expression	0 (No Diff.)	+(Increased)	-(Decreased)

**Table 2.** Summary of the “I Love My Sun – 4” evaluation results.

Count er	Surname	Name	Gender	Bi*	Bii*	Biii *	Biv*	Ai*	Aii*	Aiii *	Aiv *	Av*	Avi *
1	ACAR	Elif Burcu	F	No	Yes	No	+	Flare	Space Weather Magsphere	Yes	Yes	No	+
2	BAŞABAK	Duru	F	No	Yes	Yes	+	Other	Other	Yes	Yes	No	+
3	ÇAKIR	Şevval	F	No	Yes	No	+	Other	Other	Yes	Yes	No	+++
4	DUMANK AYA	Ayşegül	F	No	Yes	Yes	+++	Sun Spot Flare	Space Weather Magsphere	Yes	Yes	No	+++
5	İLİKLİER	Göksu	F	No	Yes	Yes	+	Other	Other	Yes	Yes	No	+++
6	ÇARDAKK AYA	Can	M	No	Yes	No	0 (No Diff)	Flare	Space Weather Magsphere	Yes	Yes	No	+++
7	KEMALİ	Efe	M	No	Yes	No	+	Other	Space Weather	Yes	Yes	No	+++
8	KIRBAŞ	Efe	M	No	Yes	No	0 (No Diff)	Other	Other	Yes	Yes	No	-
9	SU	Ümit Ege	M	No	Yes	No	+	Other	Magsphere	Yes	No Diff.	No	35
10	ŞATIROĞL U	Mert	M	No	Yes	Yes	+	Other	Space Weather	Yes	Yes	No	

Nesrehan, Bulgaria, 3-7 June 2013

## Legend

<b>A*</b>	: ACTION <b>AFTER</b> THE TUTORIAL			
Ai*	Human characters are replaced by:	SPACE WEATHER (Sun Spots; Solar Wind; Aurora; ...)		
Aii*	Sun-Earth relations are expressed in terms of	SPACE WEATHER (Sun Spots; Solar Wind; Aurora; ...)		
Aiii*	Has the Sun become a major character?	YES	NO	
Aiv*	Does the child use brighter/richer colors in this phase of the event?	YES	NO	SAME
Av*	Does the child draws a similar one to that of pre tutorial	YES	NO	
Avi*	The difference between age 8 and age 11 in quality of perception, enhancement of knowledge and expression	0 (No Diff.)	+ (Increased)	- (Decreased)
<b>B*</b>	: ACTION <b>BEFORE</b> THE TUTORIAL			
Bi*	Human characters are used as solar features.	YES	NO	
Bii*	Sun-Earth connections are in the form of daily life experiences (e.g. Flowers, grass, happy children, etc.)	YES	NO	
Biii*	Is the Sun a major character in the drawings (e.g. does the Sun occupy a major part or is it placed in one of the corners of the drawing?)	YES	NO	
Biv*	The difference between age 8 and age 11 in quality of perception, enhancement of knowledge and expression	0 (No Diff.)	+ (Increased)	- (Decreased)

cont.

**Output of I Love My Sun 4 second visit has been evaluated the first time by using “metric like” template which is expected to be the seat of a more objective template of the future tasks**

cont.

- I Love My Sun – 3 was **repeated** with a sub group of 10 students who are now  
**9 or 10 years.**
- The objective of creating an awareness on the scientific Sun, Sun-Earth relations is fulfilled again.

cont.

However, within the 10-11 years old  
**differences** between  
“before” and “after” training paintings  
are **not as sharp** as the  
differences observed when they were  
7-8 years old

cont.

I Love My Sun Activity seems  
**more influential and effective in  
creating awareness** among the school  
children

**7-8 years old**

compared to those of

**10-11 years old**



cont.

Summarising:

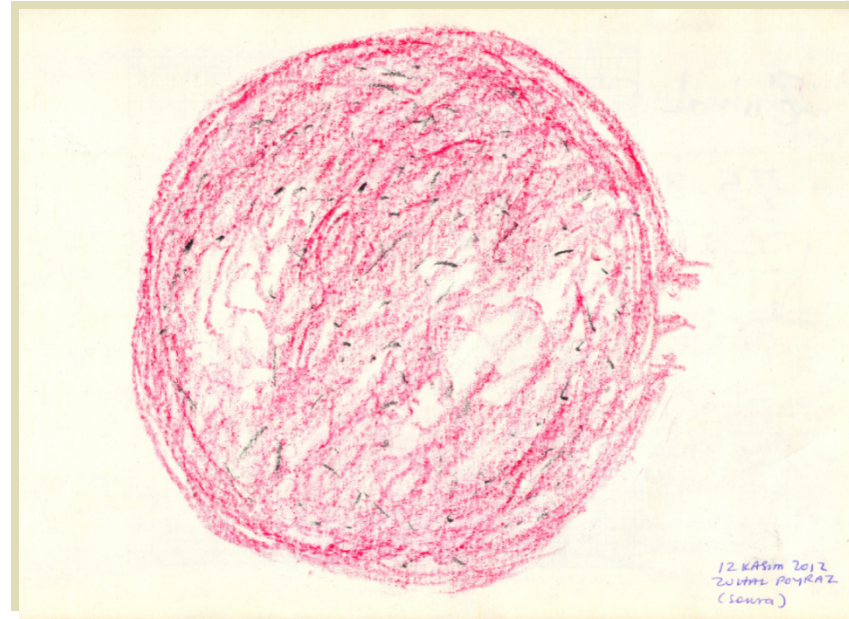
**children added to their perception  
considerable amount of elements  
gained from popular, commercial  
non - scientific media**

- ***Retirement Centre in Ankara 2012***
- ***(age group over 70 yr old)***

# Zuhal Poyraz



**before**



**after**

# Ayten Mutluer



**before**



**after**

# Orhan Doğaner



**before**



**after**

# Muzaffer Ünver



**before**



**after**

## *Conclusion*

- With the **I Love My Sun 2** Event a **new dimension** in outreach was brought by including **children W ASD** who must be treated with great care in societies.
- To our knowledge this is the **first** experiment to **reach** the **children W ASD** together with children **without ASD**.

cont.

**One main objective** of I love My Sun  
Project  
in the framework of the **COST ES0803**  
**Action**

**to conduct the Project at European level**



cont.

**With the I Love My Sun 3 a spatial  
parameter was brought which means  
the initiative has gone European**

cont.

**I Love My Sun 4 Event brought  
two novel components:  
temporal dimension and metrics  
into the action**

•

- **Based on a very small sample the I love My Sun Tool achieved a positive awareness of Space Weather within the senior participants of a Turkish Retirement Centre**

cont.

Although,  
sample **sizes** are **small**  
**impact** of **training** is **positively**  
**increased** more during **pre** and **after**  
**training** phases in case of girls of 8-  
10 year age group compared to the  
case of boys

cont.

- It is to be noted that the exercise has been **aimed to demonstrate the method** rather than producing some statistical results since the population of interest herewith is not large enough statistically

cont.

- This **Method**, when it becomes **firm**

can **be justified statistically** when

**I Love My Sun**

is **repeated with a larger population**

## *Summary of the concluding remarks*

- **I Love My Sun Activity served as a mean of introducing the outreach topic to non-professionals in an enjoyable and relaxing mode.**

cont.

- **A novel metric like template was also developed to measure the non-countable outcomes of an outreach activity in a manner as objective as possible**



cont.

- The **method** and the **technique** of **measurement** of outcomes are **adoptable** and **open** to further **developments** and **generalizations**

cont.

- Therefore, the **method** and **metric** are **not limited** to a **certain activity** like

**I Love My Sun** but open to  
**generalisation to other activities**

# *Acknowledgements*

***It is acknowledged and thanked all the children and the Senior People who took part in the “several Events”***

# References

- **References**

- COST 724 final report: Developing the scientific basis for monitoring, modeling and predicting Space Weather; Eds. J. Liliensten., A. Belehaki, M. Messerotti, R. Vainio, J. Watermann, S. Poedts"; ref. within the book: (i) Y. Tulunay, "Education: discussion and Case Studies , pp. 321-324 and (ii) Space Weather and Europe – an Educational Tool with the Sun (SWEETS) ,Y. Tulunay, pp.337-341], 2008. [<http://www.cost.esf.org/library/publications/09-04-Developing-the-Scientific-Basis-for-Monitoring-Modelling-and-Predicting-Space-Weather>] Putting the "I" in IHY; Eds. B.J. Thompson, N. Gopalswamy, J.M. Davila, H.J. Haubold; ref. within the book: Turkey, pp.209-212, 2009. [<http://ihy2007.org/>]
- ESWW8 "I Love My Sun for the World-Wide Space Weather Community", N.B.Crosby, Y.Tulunay, S.Calders, A.Parnowski, S.Desanka, E.Tulunay. Namur Belgium, 2011
- Fombonne E. , 'Epidemiology of autistic disorder and other pervasive developmental disorders' , *J. of Clinical Psychiatry* , 66:3-8, 2005. IHY 2007-2009 (<http://ihy2007.org/>)
- Bailey A, Palferman S, Heavey L, Le Couteur A., 'Autism: The Phenotype in Relatives' , *J. of Autism and Developmental Disorders*, 28: 369–92 (1998)
- Bhaumik S.,Branford D.,McGrother C.,Thorp C. 'Autistic traits in adults with learning disabilities' , *British J. of Psychiatry*, 170: 502-506, 1997.
- Frith U. , 'Asperger and his syndrome' , in: *Uta Frith. Autism and Asperger Syndrome*, Cambridge,1-37, 1993.
- Frith U. , *Autism*. Blackwell, 1999.
- Baron-Cohen S, Wheelwright S, Skinner R., Martin J., Clubley E. , 'The autism-spectrum quotient (AQ) : evidence from Asperger syndrome / high functioning autism, males and females, scientists and mathematicians ' , *J. of Autism Dev. Disord.* , 31(1):5-17, 2001.
- Otistik Çocuklar Eğitim Programı, T.C. M.E.B Özel Eğitim, Rehberlik ve Danışma Hizmetleri Gen. Müd. , Ankara 2000