

# Reference to an unnamed temporary object (life time)

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Asked 9 years ago   Modified 9 years ago   Viewed 1k times

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After reading [this answer](#) from [idjarn](#), I wrote the following example, and it looks like an unnamed temporary object has the same life time as its reference!

How come this is possible?

Is it specified in the C++ standard?

Which version?

Source code:

```
#include <iostream> //cout
#include <sstream> //ostringstream

int main ()
{
    std::ostringstream oss;
    oss << 1234;

    std::string const& str = oss.str();
    char const* ptr = str.c_str();

    // Change the stream content
    oss << "_more_stuff_";
    oss.str(""); //reset
    oss << "Beginning";
    std::cout << oss.str() <<'\n';

    // Fill the call stack
    // ... create many local variables, call functions...

    // Change again the stream content
    oss << "Again";
    oss.str(""); //reset
    oss << "Next should be '1234': ";
    std::cout << oss.str() <<'\n';

    // Check if the ptr is still unchanged
    std::cout << ptr << std::endl;
}
```

## Execution:

```
> g++ --version
g++ (GCC) 4.1.2 20080704 (Red Hat 4.1.2-54)
Copyright (C) 2006 Free Software Foundation, Inc.
This is free software; see the source for copying conditions. There is NO
warranty; not even for MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.
> g++ main.cpp -O3
> ./a.out
Beginning
Next should be '1234':
1234
```

c++   reference   temporary   object-lifetime

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edited May 23, 2017 at 12:16

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1 ● 1

asked Mar 7, 2013 at 9:39

oHo

44.8k ● 26 ● 149 ● 187

4

The fact that `const` references extend the lifetime of temporaries should be covered fairly on in your C++ book. – [Lightness Races in Orbit](#) Mar 7, 2013 at 9:41

1

You should find your answer if you just try searching the web for the phrase you used: *temporary object has the same life time as its reference* – [Jonathan Wakely](#) Mar 7, 2013 at 9:48

1

possible duplicate of [Lifetime of temporaries](#) / look what I found – [Lightness Races in Orbit](#) Mar 7, 2013 at 9:54

2

@olibre: Yeah, you're right. I must have been drunk. – [Lightness Races in Orbit](#) Mar 7, 2013 at 15:27

1

@olibre: [You cannot](#). – [Lightness Races in Orbit](#) Mar 10, 2013 at 22:59

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How come this is possible?

Because the standard says so, because it's deemed useful. rvalue references and `const` lvalue references extend the lifetime of temporaries:

[C++11: 12.2/5]: [...]The temporary to which the reference is bound or the temporary that is the complete object of a subobject to which the reference is bound persists for the lifetime of the reference, except [...]

and exhaustive wording in [C++11: 8.5.3/5] requires that we shall not bind temporaries to non-`const` lvalue references.

Is it specified in the C++ standard? Which version?

Yes. All of them.

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edited Mar 7, 2013 at 9:52

answered Mar 7, 2013 at 9:42

Lightness Races in Orbit

367k ● 72 ● 612 ● 1016

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A temporary bound to a const reference increases the lifetime of the temporary till the lifetime of the constant reference.

Good Read:

[GotW #88: A Candidate For the “Most Important const”](#)

Yes it is specified in the C++ standard from the time references were introduced. So if you are wondering if this is C++11 feature, no it is not. It already existed in C++03.

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answered Mar 7, 2013 at 9:42

Alok Save

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[Lightness Races in Orbit](#) is right. And I think this example would be more concise.

```
#include <iostream> //cout
#include <string>

int main ()
{
    using namespace std;
    int a = 123;
    int b = 123;
    // int &a_b = a + b; // error!
    int const& a_b = a + b;
    cout<<"hello world!"<<endl;
    cout<<a_b<<endl;
}
```

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edited May 23, 2017 at 12:33

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answered Mar 7, 2013 at 10:30

Pony279

353 ● 1 ● 5 ● 12

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