

Section 2.1 C++11

Variadic Templates

In short, class templates that do not take specifically *types* as their template parameters cannot be used in instantiations of C4.

In the general case, template template parameter packs may appear together with other template parameters and follow the rules and restrictions discussed so far in the context of type parameter packs. ~~Any number of subtle but nevertheless perfectly meaningful matching cases can be defined involving combinations of fixed and variadic template parameters.~~ Suppose, for example, we want to define a class template C5 that accepts a template that takes *at least* two parameters and possibly more:

```
template <template<typename, typename, typename...> class X>
class C5
    // class template definition having one template template parameter
    // for which the template template accepts two or more type
    // arguments
{ /*...*/ };

// a few templates that match C5

template <typename, typename> class B1;
template <typename, typename = int> class B2;
template <typename, typename = int, typename = int> class B3;
template <typename, typename, typename...> class B4;

C5<B1> c5a; // OK
C5<B2> c5b; // OK
C5<B3> c5c; // OK
C5<B4> c5d; // OK
```

However, templates that don't have two fixed type parameters in the first two positions will not match C5:

```
template <typename> class B5;
template <int, typename, typename...> class B6;
template <typename, typename, int, typename...> class B7;
template <typename, typename...> class B8;

C5<B5> c5d; // Error, argument mismatch
C5<B6> c5e; // Error, argument mismatch
C5<B7> c5f; // Error, argument mismatch
C5<B8> c5g; // Error, argument mismatch
```

To match C5's template parameter, a template must take types for its first two parameters, followed by zero or more type parameters (with default values or not). B5 does not match because it takes only one parameter. B6 does not match because it takes an **int** in the first position, as opposed to a type, as required. B7 fails to match because it takes an **int** in the third position instead of a type. Finally, B8 is not a match because its second argument is not fixed.